Abstract Book

13th European Breast Cancer Conference (EBCC-13)
16–18 November 2022
Barcelona, Spain

Publication of this Supplement is supported by the European Breast Cancer Council
## European Journal of Cancer

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Publication of this Supplement is supported by the European Breast Cancer Council.
Background: Neoadjuvant systemic therapy (NST) is increasingly applied in breast cancer to increase breast-conserving surgery (BCS) rates and to improve oncological outcomes. Ductal carcinoma in situ (DCIS) can be present adjacent to invasive breast cancer (IBC), especially in HER2-positive IBC. DCIS was previously considered to be insensitive to NST. Consequently, mastectomy rates are higher in IBC with adjacent DCIS. Recent studies have shown that DCIS can be sensitive to NST, however, only small populations were investigated. Therefore, the aim of this study was to determine the rate of complete response of adjacent DCIS in HER2-positive IBC and to assess the potential influence of clinicopathological variables in a nationwide cohort.

Materials and methods: All women diagnosed with HER2-positive IBC, treated with NST and surgery between January 2010 and December 2019, were selected from the Netherlands Cancer Registry (NCR). Of these patients, all pre-NST biopsy and postoperative specimen pathology reports were obtained from PALGA, the Dutch Pathology Registry, and assessed for presence of DCIS. Response of DCIS was defined as absence of DCIS in postoperative pathology when a DCIS component was present in the pre-NST biopsy. Clinicopathological factors associated with DCIS response were assessed using logistic regression analyses.

Results: In total, 5834 patients were included, of whom 1443 (24.7%) had a DCIS component in the pre-NST biopsy. Mastectomy rates were higher in IBC with adjacent DCIS compared to IBC without adjacent DCIS in the pre-NST biopsy (53.6% versus 41.0%, p < 0.001). Of these 1443 patients, 743 (51.5%) showed complete response of the DCIS component. Complete response of DCIS occurred more frequently in patients who also had a complete response of IBC (63.4% versus 33.8%, p < 0.001). Multivariable logistic regression analysis showed ER negative IBC (OR 1.79; 95% CI 1.33-2.32) and treatment with HER2-targeted therapy (OR 5.97; 95% CI 1.82-19.55) to be independently associated with complete response of DCIS.

Conclusions: More than half of HER2-positive IBC patients with adjacent DCIS in the pre-NST biopsy showed a complete response of the DCIS component to NST. Complete response of DCIS should be considered, especially in ER-negative HER2-positive IBC and in case of complete response of IBC. Future studies should investigate the evaluation of DCIS response by imaging and the possibility of increasing breast-conserving surgery rates.

No conflict of interest.
Background: The standard of care for most early breast cancer patients is breast conserving surgery (BCS), adjuvant radiotherapy (RT) and systemic therapy. Several trials have confirmed that RT reduces local recurrence, but there are few reports of trials with long-term follow up assessing the impact of omission of RT on overall survival. The Scottish Conservation trial of BCS & systemic therapy appropriate to ER status z postoperative whole breast RT (Forrest et al. Lancet 1996:348:708–13) showed ipsilateral breast tumour recurrence (IBTR) of 24.5% in the no RT arm and 5.8% in the RT arm but no difference in overall survival at 6 years randomisation. We report the long-term impact within this study of postoperative loco-regional RT or its omission on IBTR, overall survival, regional recurrence, metastases and breast cancer deaths.

Methods: 585 patients aged ≤70 years with early breast cancer ≤4 cm (T0,T1a,T2a, N0, N1a, N1b, M0) underwent local excision with a 1 cm margin, axillary node sampling or axillary node clearance. Adjuvant systemic therapy of tamoxifen or CMF was given dependent on ER status. Patients were stratified by menopausal and ER status and RT status. HR was added to the RT arm. IBTR was defined as the first occurrence of breast malignancy in the treated breast or the ipsilateral breast after a period of 12 months in the no RT arm.

Results: The two arms were well balanced for age, menopausal status, adjuvant systemic therapy, type of axillary surgery, laterality, tumour size, grade and hormone receptor status. RT status and ER status. IBTR was assessed and HR status. RT was added to the ER status. IBTR was associated with the difference in first 10 years of treatment. There was no evidence of a difference in overall survival, HR = 1.08 (95% CI 0.89, 1.30), p = 0.43, with survival rates similar to 30 years (table 1).

Conclusions: Adjuvant loco-regional RT with systemic therapy appropriate to ER status reduces the risk of IBTR in the first 10 years of follow up but has no impact thereafter on IBTR nor on overall survival up to 30 years.

No conflict of interest.
Sara Toloney reports grants for PI of studies (all funding to institute) from Eli Lilly, Novartis, AstraZeneca, Merck, Nektar, Pfizer, Genentech/Roche, Exelixis, Bristol-Myers Squibb, Eisai, NanoString, Cyclacel, Sanofi, Odonate, and Gilead Personal fees/honorarium for consultant/advisory board (outside this review) from Eli Lilly, Novartis, and AstraZeneca Personal fees for consultant/advisory board from Merck, Nektar, Pfizer, Genentech/Roche, Eisai, NanoString, Odonate, and Gilead Personal fees for travel expense reimbursement for ad board from Nektar Personal fees/ honorarium for advisory board from Bristol-Myers Squibb, Puma, Sanofi, G1 Therapeutics, OncoReP, Kyowa Kirin Pharmaceuticals, Daiichi-Sankyo, Samsung Bioepis Inc., Certara, Mersana Therapeutics, OncoSec, Ellipses Pharma, 4D Pharma, BeyondSpring Pharma, OncXerna, Infinity Therapeutics, Zenthalum, Zyworkos Personal fees/honorarium for consulting from Seattle Genetics, Astem, CytoXm, and Chugai Pharma Personal fees for steering committee from CytoXm.

Erika Hamilton reports grant to institution for fees associated with clinical trial from Novartis Grant to institution for conduct of clinical trial on whom Dr. Hamilton served as PI from Pfizer, Genentech/Roche, Lilly, Puma Biotechnology, Daiichi Sankyo, Mersana, Boehringer Ingelheim, Cascadian Therapeutics, AstraZeneca, Huttonchin MedPharma, OncoMed, MedImmune, Stem CentRx, Curis, Verastem, Zyworkos, Syndax, Lycera, Renix, Millennium, TapImmune, BerGenBio, Medivation, Tesaro, Kadmon, Eisai, H3 Biomedicine, Radius Health, Acerfa Pharma, Takeda, Macrogenics, Abbvie, Immunomedics, Fujifilm, eFFECTOR Therapeutics, Mallinckrodt, Menus, Nucana, Tetralogic Pharmaceuticals, PharmaMar, Regeneron, Leap Therapeutics, Taiho Pharmaceutical, EMD Serono, Syros, Clovis, CytoXm, InventisBio, Oncothryon, and Novartis Non-financial support - Payment or reimbursement of exact amount of expenses from Genentech/Roche, Lilly, Daiichi Sankyo, AstraZeneca, Tesaro, Eisai, Novartis, EMD Serono, Clovis, Amgen, Bayer, Bristol-Myers Squibb, Genzyme, Heliosn Therapeutics, HERON, Lexicon, Medivation, Merck, Roche, Nexxus, Guardant Health, and Foundation Medicine Personal fees for consulting from Flatiron Payment to institution for consulting services performed by Dr. Hamilton from Pfizer, Genentech/Roche, Lilly, Puma Biotechnology, Daiichi Sankyo, Mersana, Boehringer Ingelheim, Cascadian Therapeutics, and Eisai.

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F. Miglietta1,2, M. Ragazzi3, B. Fernandes4, G. Griguolo1,2, D. Massa1,2, Celsion, and Merck Personal fees for travel, accommodations, and expenses Pharma, Eisai, Pfizer, Novartis, Eli Lilly, Rugo reports institution grants from Plexxikon, Macrogenics, OBI Sina Haftchnary reports employment from Novartis.

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Background: In HER2+ breast cancer (BC) patients undergoing neoadjuvant treatment (NAT), higher levels of baseline TILs are associated with both increased rates of pathologic complete response (pCR) and improved survival. Data regarding the prognostic role of TILs on residual disease (RD) in patients failing to achieve pCR are conflicting.

Material and Methods: HER2+BC patients treated with chemotherapy (CT) plus anti-HER2-based NAT at 3 Italian Institutions were included. RCB and stromal TILs (RD-TILs) were evaluated on post-NAT samples in case of no-pCR. RCB was considered both as a continuous and a categorical variable (classes III/II/II). The Harrell's c-index was used to determine the optimal prognostic cutoff for RD-TILs. The log-rank test was used to perform survival analyses and the Cox regression model to calculate hazard ratios (HRs) and 95% confidence intervals (CIs). C-indexes were evaluated to compare the performance of the prognostic models.

Results: 295 HER2+BC patients were included. NAT consisted on anti-HER2 therapy+CT (83.3% anthracycline + taxane). 66.1% of patients (n = 195) had RD after NAT. RCB and RD-TILs were available for 180 and 159 patients, respectively. Mean and median RCB scores were 2.1 and 1.7. RCB class distribution was: I = 21.7%, II = 62.2%, III = 16.1%. Mean and median RD-TILs were 9.6% and 5.0%. 15% of RD-TILs was identified as the optimal prognostic cutoff for OS. The distribution of RD-TIL categories was: low (<15%) 82.4%, high (≥15%) 17.6%.

RCB was significantly associated with OS (RRC scores, p < 0.001; 5-year OS for RCB class I vs II vs III: 93.0% vs 86.3% vs 62.0%, p < 0.001). High RCB-TILs were significantly associated with poorer OS (HR = 2.92 [95%CI 1.07–5.03]; 5-year OS for high vs low RD-TILs: 67.9% vs 83.7%, p = 0.028).

At multivariable analysis both RCB score and RD-TILs categories maintained their independent prognostic value for OS (RCB: HR = 1.90 [95%CI 1.35–2.67] p < 0.001; RD-TILs: HR = 2.30 [95%CI 1.06–5.01], p = 0.036).

The combined score RCB + TIL was calculated from the estimated coefficient of each variable in the bivariate logistic model for OS: RD-TILs (0 = low/high) = 0.83 + RCB (score) = 0.64. RCB + TIL score was significantly associated with OS (p < 0.001). The C-index of RCB-TIL score was numerically higher than that of RCB (0.73 vs 0.66, p = 0.08) and significantly higher than that of RD-TILs (0.73 vs 0.58, p = 0.007).

Conclusions: We reported an independent negative prognostic impact of higher RD-TILs after anti-HER2+CT-based NAT which might potentially underly an unbalance of RD immune microenvironment towards immuno-suppressive features. We also provided a new composite prognostic score based on RCB+TIL which was significantly associated with OS. The comparison of prognostic model performance revealed that RCB+TIL score was capable of providing additional prognostic information than either RCB (trend) or RD-TILs alone.

Conflict of interest:
Advisory Board: FM: Roche, Novartis, Gilead.
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Poster Discussion Session 1

5 (PB-001) Poster Discussion
The successful patient-preference design for the LORD-trial to test whether active surveillance for low-risk Ductal Carcinoma In Situ is safe

R. Schmidt,1 C. Sondermeyer,2 V. van der Noort,2 E. Enghardt,1 M. Gerritsma,3 E. Verschuur,3 M. van Oinsouw,2 E. Bleeker,2 N. Bijker,7 R. Mann,4 F. van Duijnhoven4, J. Wesseling,5 Grand Challenge PRECISION consortia.

Netherlands Cancer Institute, Molecular Pathology, Amsterdam, Netherlands; Netherlands Cancer Institute, Biometrics, Amsterdam, Netherlands; Netherlands Cancer Institute, Psycho-Oncology and Epidemiology, Amsterdam, Netherlands; Netherlands Cancer Institute, Psycho-Oncology and Epidemiology, Amsterdam, Netherlands; Borstkankerregeringen Nederland, Patent Representatie Utrecht, Netherlands; Netherlands Cancer Institute, Psycho-Oncology and Epidemiology, Amsterdam, Netherlands; Amsterdam University Medical...
Background: Ductal carcinoma in situ (DCIS) is a potential precursor to invasive breast cancer. However, up to 80% will never progress into invasive breast cancer during the patient’s lifetime. Therefore, there is a growing concern of overdiagnosis and subsequent overtreatment of women with DCIS. When overtreatment occurs, patients might be unintentionally harmed by diagnostic and treatment procedures.

Methods: To investigate non-inferiority of an active surveillance strategy in women with low-risk DCIS (grade I-II) compared to the conventional treatment, i.e. surgery with or without radiotherapy. The primary outcome of the trial is the percentage of women without an ipsilateral invasive breast cancer after a follow-up of ten years. As a randomized controlled trial (RCT), recruitment was initially unsuccessful, as many women had a clear preference for either one of the trial arms. Therefore, one could question whether RCT is the optimal design in de-escalation studies or whether a patient preference trial (PPT) would be a more suitable and realistic alternative. In this study we present the effect of the conversion of the LORD-trial to a PPT on the inclusion rate.

Results: Since the transformation of the LORD-trial from a randomized to a patient preference design, recruitment has increased more than tenfold. In the RCT-design, 73 patients were included between 2017 and the design change in 2020. Lack of autonomy was reported as the most important reason to decline randomization. Two years after transformation to a PPT, over 650 additional patients were recruited from 50 sites in the Netherlands.

Conclusions: Transforming the LORD trial into a patient preference trial has boosted the accrual rate manifold. For de-escalating management of low-risk DCIS, most women obviously prefer a shared decision-making strategy, which enables them to make a well-informed decision that is in-line with their values and expectations. It also indicates that sufficient patient numbers can be included to meet the requirements of the power calculation.

This work was supported by Cancer Research UK and by KWF Dutch Cancer Society (ref:C3831/2A24043); Web site: https://cancergrand challenges.org/teams/precision.

No conflict of interest.

6 (PB-002) Poster Discussion Borderline and malignant phyllodes tumors of the breast: a population-based study of all cases in the Netherlands 1969–2020

S. Bartels1, J. van Olmen1, E. Bekers1, C. Drukker1, F. van Duijnhooven1, 1NKI-AVL, Department of Surgical Oncology, Amsterdam, Netherlands; 2NKI-AVL, Department of Pathology, Amsterdam, Netherlands

Background: Borderline and malignant phyllodes tumors (BPT/MPT) are rare breast tumors. Guidelines on breast conserving surgery (BCS), surgical margins (>3 mm/≥1 cm) or adjuvant radiotherapy (RT) are based on low level evidence.

Material and methods: Data on all patients with a BPT/MPT 1989–2020 were extracted from the Netherlands Cancer Registry and PALGA (Dutch Pathology Registry). Data were retrospectively analyzed using summary statistics, Kaplan Meier (KM) analysis for overall survival (OS), disease free survival (DFS) and distant metastasis free survival (DFMS); Cox regression for corrected OS and logistic regression for time trends (2000–2019).

Results:

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<td>PT n = 467</td>
<td>PT n = 468</td>
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<td>Tumor size (mm)</td>
<td>50 [42–59]</td>
<td>55 [46–68]</td>
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<td>First surgery type</td>
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<td>Mastectomy</td>
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<td>&lt;1 mm</td>
<td>141 (35.0)</td>
<td>84 (29.6)</td>
</tr>
<tr>
<td>1–3 mm</td>
<td>51 (12.7)</td>
<td>40 (14.1)</td>
</tr>
<tr>
<td>&gt;3 mm</td>
<td>11 (2.7)</td>
<td>12 (4.2)</td>
</tr>
<tr>
<td>Radical (but no mm given)</td>
<td>34 (8.4)</td>
<td>28 (9.9)</td>
</tr>
<tr>
<td>Missing data/ unclear margins</td>
<td>37 (9.2)</td>
<td>31 (11.0)</td>
</tr>
<tr>
<td>LRR + distant metastases</td>
<td>0 (0)</td>
<td>14 (3.0)</td>
</tr>
<tr>
<td>Breast conserving surgery</td>
<td>378 (80.9)</td>
<td>218 (46.6)</td>
</tr>
<tr>
<td>Missing</td>
<td>4 (0.9)</td>
<td>7 (1.5)</td>
</tr>
<tr>
<td>Adjuvant radiotherapy</td>
<td>No</td>
<td>454 (97.2)</td>
</tr>
<tr>
<td>Yes</td>
<td>13 (2.8)</td>
<td>69 (14.8)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0)</td>
<td>397 (84.8)</td>
</tr>
<tr>
<td>Any disease recurrence</td>
<td>47 (10.1)</td>
<td>86 (18.4)</td>
</tr>
<tr>
<td>Locoregional recurrence (LRR) only</td>
<td>44 (9.4)</td>
<td>40 (8.6)</td>
</tr>
<tr>
<td>LRR + distant metastases</td>
<td>0 (0)</td>
<td>14 (3.0)</td>
</tr>
<tr>
<td>Distant metastases only</td>
<td>3 (0.6)</td>
<td>32 (6.8)</td>
</tr>
<tr>
<td>Missing</td>
<td>5 (1.1)</td>
<td>7 (1.5)</td>
</tr>
<tr>
<td>&gt;3 mm to LRR</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
</tr>
<tr>
<td>1–3 mm to LRR</td>
<td>20 (1–3–4.4)</td>
<td>13 (3.7–4.2)</td>
</tr>
<tr>
<td>Years to distant metastases</td>
<td>0.415</td>
<td>0.734</td>
</tr>
</tbody>
</table>

Results: Baseline, tumor and treatment characteristics of 935 (female) patients are shown in Table 1. Over time, more patients with a BPT had BCS as final procedure (OR 1.07 95% CI 1.01–1.12), but this was not observed in MPT. Over time, more often adjuvant RT was given for MPT (OR 1.08 95% CI 1.01–1.12). KM 10-year estimate for OS in BPT was 97.7% (95% CI 84.1–91.2) and in MPT 97.0% (95% CI 66.7–75.2). OS corrected for age BPT vs. MPT: HR 1.92 (95% CI 1.42–2.60). KM 5-year estimate for DFS in BPT was 92.0% (95% CI 87.3–93.1) and in MPT 83.2% (95% CI 79.7–86.7). KM 5-year estimate for DMFS in MPT was 91.3% (95% CI 88.8–94.0).

Conclusion: Over time, treatment involved more BCS for BPT and more adjuvant RT for MPT. In BCS, smaller margins were accepted without re-excision then guidelines recommend.

No conflict of interest.

7 (PB-003) Poster Discussion Intraoperative ultrasound is accurate for guiding breast conservative surgery in non-palpable ductal carcinoma in situ of the breast

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Abstracts, EBCC-13 Poster Discussion Session
Does the use of an Intraoperative device to assess margins reduce the need for re-excision after Breast Cancer surgery: Multicentre Randomised Controlled Trial

**Background:** Intraoperative ultrasound guided surgery (IOUS) is an effective technique for invasive breast cancer with advantages over wire localization (WL) including smaller resection volumes, lower rate of involved margins and better patient satisfaction. Nevertheless, there are few reports for ductal carcinoma in situ (DCIS) surgery. The objective of this study is to compare specimen margins and volume of excision for DCIS after IOUS vs WL.

**Material and methods:** From February 2018 to December 2021, women diagnosed with DCIS eligible for breast conserving surgery guided by IOUS or WL were recruited into a prospectively maintained database. For IOUS surgery, after initial core biopsy, a US visible clip was placed at the biopsy site. At the time of surgery, distance from the clip to the end of microcalcifications in mammogram was assessed to guide the clip excision by IOUS. Specimen mammogram was performed to verify complete excision. Comparison was done for margin status, second surgeries and volume of excess healthy breast tissue resected defined by the calculated resection ratio (CRR).

**Results:** The study included 108 patients, 41 (37.96%) in the IOUS group and 67 (62.04%) in the WL group. IOUS patients were younger (p = 0.02) and had DCIS with comedonecrosis (p = 0.01). There were no differences in tumor size (p = 0.64) or grade (p = 0.53) between groups. IOUS showed smaller surgical volumes: 21.86 cm³ vs. 47.18 cm³ (p = 0.07) and significantly smaller CRR: 1.6 vs. 2.9 (p = 0.03).

Two (4.6%) patients in the IOUS group had positive margins while 7 (10.4%) in the WL group. Re-excision rate was lower in the IOUS group (p = 0.08).

**Table: Baseline characteristics**

<table>
<thead>
<tr>
<th></th>
<th>IOUS (41 patients)</th>
<th>WL (67 patients)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age. Mean</td>
<td>52.87 (35–78)</td>
<td>57.76 (39–82)</td>
<td>0.02</td>
</tr>
<tr>
<td>DCIS size</td>
<td>17.46 (4–50)</td>
<td>17.06 (2–70)</td>
<td>0.64</td>
</tr>
<tr>
<td>DCIS grade</td>
<td></td>
<td>0.93</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>13 (37.11%)</td>
<td>1 (31.34%)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>14 (34.15%)</td>
<td>19 (28.36%)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>14 (34.15%)</td>
<td>27 (40.30%)</td>
<td></td>
</tr>
<tr>
<td>Comedonecrosis</td>
<td>8 (19.51%)</td>
<td>3 (4.48%)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>33 (80.49%)</td>
<td>64 (95.52%)</td>
<td></td>
</tr>
<tr>
<td>ER receptor</td>
<td></td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>35 (85.67%)</td>
<td>8 (86.57%)</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>6 (14.33%)</td>
<td>9 (13.43%)</td>
<td></td>
</tr>
<tr>
<td>PR receptor</td>
<td></td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>33 (80.49%)</td>
<td>46 (68.66%)</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>8 (19.51%)</td>
<td>21 (31.34%)</td>
<td></td>
</tr>
<tr>
<td>Clip placed after biopsy</td>
<td></td>
<td></td>
<td>0.0001</td>
</tr>
<tr>
<td>Yes</td>
<td>41 (100%)</td>
<td>15 (22.73%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>51 (77.27%)</td>
<td></td>
</tr>
<tr>
<td>Re-excision for positive margins</td>
<td></td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td>Yes</td>
<td>2 (4.88%)</td>
<td>7 (10.45%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>39 (95.12%)</td>
<td>60 (89.55%)</td>
<td></td>
</tr>
<tr>
<td>Type of re-excision</td>
<td></td>
<td></td>
<td>0.45</td>
</tr>
<tr>
<td>BCS Mastectomy</td>
<td>2 (100%)</td>
<td>5 (71.43%)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2 (28.57%)</td>
<td>2 (28.57%)</td>
<td></td>
</tr>
<tr>
<td>Radiotherapy</td>
<td></td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38 (92.68%)</td>
<td>65 (97.01%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3 (7.32%)</td>
<td>2 (2.99%)</td>
<td></td>
</tr>
<tr>
<td>Endocrine therapy</td>
<td></td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>Yes</td>
<td>34 (82.93%)</td>
<td>58 (86.57%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5 (12.00%)</td>
<td>7 (10.44%)</td>
<td></td>
</tr>
<tr>
<td>Patient refusal</td>
<td>2 (4.88%)</td>
<td>2 (4.88%)</td>
<td>0.65</td>
</tr>
<tr>
<td>Oncoplastic surgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (24.39%)</td>
<td>19 (28.36%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>31 (75.61%)</td>
<td>48 (71.64%)</td>
<td></td>
</tr>
</tbody>
</table>

No differences in DFS were observed (1 recurrence in the WL group vs 0 in the IOUS (p = 0.45)), FU of 16.17 months (Range 1.4–43 months).

**Conclusions:** IOUS is an accurate localization method for guiding DCIS surgery. It decreases excision of healthy breast tissue while increasing rates of negative margins compared to WL.

**No conflict of interest.**
Background: Yoga improved fatigue and immunological profile in cancer survivors and has been a promising alternative therapy. Breast cancer treatments are rapidly improving along with their side effects. In this study we investigated the effect of the yogic intervention at a different time interval during the radiotherapy/chemotherapy on the pro and anti-inflammatory interleukins along with the fatigue and quality of life among patients with stage III/II breast cancer.

Methods: A total of 96 stage III/II breast cancer patients were enrolled in this study and randomly divided into two different groups. Group-I (non-Yoga) received chemotherapy and/or radiotherapy and group II (Yoga) received an additional yogic intervention. Both the groups were followed up for a period of 48 weeks and blood was collected at the time of enrolment, 16, 32, and 48 weeks. Serum was isolated to measure the pro and anti-inflammatory interleukins, fatigue, and functional scale questionnaire was obtained at each time point. We have also used the validated questionnaire of the European Organization for Research and Treatment of Cancer to measure the quality of life (EORTC-QLQ30) of breast cancer patients.

Result: In group II functional scale was improved from the baseline to 16, 32, and 48 weeks were 44.49 ± 2.31, 55.64 ± 2.09, 60.8 ± 1.96, 72.14 ± 1.79 respectively. Whereas in group-I overall little improvement was also recorded from baseline 46.27 ± 1.75 to 48 weeks 54.43 ± 2.38. In group-II fatigue was also improved from the baseline to 16, 32, and 48 weeks were 42.38 ± 2.70, 54.8 ± 2.79, 58.33 ± 2.61, 62.44 ± 2.58 respectively and overall little improvement was also recorded in the group-I from baseline 42.18 ± 2.81 to 48 weeks 50.95 ± 3.20. In-group II overall quality of life was improved from the baseline to 16, 32, and 48 weeks were 37.33 ± 3.33, 39.87 ± 2.99, 38.79 ± 3.23, 74 ± 1.59 respectively. Whereas the poor quality of life was recorded in the group-I during treatment from baseline (39.51 ± 0.96) to 48 weeks (20.51 ± 1.57). Level of IL-10 (pg/ml) decreased significantly from 69.77 ± 6.22 to 61.16 ± 3.41 (p = 0.001) in group-I (baseline to 48 weeks) whereas an increase in the group-I (baseline to 48 weeks) was recorded from 73.14 ± 2.66 to 81.13 ± 2.04 (p = 0.35). The level of IL-10 (pg/ml) decreased significantly from 10.47 ± 1.10 to 8.455 ± 0.61 (p = 0.001) in group-II (baseline to 48 weeks) whereas a slight decrease was recorded in the group-I (baseline to 48 weeks) was recorded from 10.97 ± 0.83 to 9.385 ± 1.216 (p = 0.35).

Conclusion: These findings suggested that improved fatigue and functional scale is associated with a lower level of IL-10. Yoga may be important additional therapy along with the cancer treatment to help the patients with cancer-related fatigue and improve their overall immunological profile and overall quality of life during treatment.

No conflict of interest.

Poster Discussion Session 2

9 (PB-005) Poster Discussion

Long-term breast cancer risk after benign breast disease in population-based screening

M. Roman1, J. Louru1, I. Vázquez1, F. Saladié2, L. Penhalva2, X. Bargallo3, M.J. Quintana4, J. Del Riego5, C. Vidal2, X. Castells9, IRIS study group.1Hospital del Mar, Epidemiology and Evaluation, Barcelona, Spain; 2IMIM Hospital del Mar Medical Research Institute, Pathology, Barcelona, Spain; 3Hospital Universitari Sant Joan de Reus, Epidemiology and Cancer Prevention Service, Tarragona, Spain; 4Private Foundation Asil Hospital, Breast Cancer Screening Technical Office, Granollers, Spain; 5Hospital Clinic, Radiology, Barcelona, Spain; 6Hospital de la Santa Creu i Sant Pau, Clinical Epidemiology and Public Health, Barcelona, Spain; 7Parc Tauli Hospital-University-UAB, Radiology, Sabadell, Spain; 8Catalan Institute of Oncology ICO, Cancer Prevention and Monitoring Program, Barcelona, Spain

Background: To assess the long-term risk of breast cancer after benign breast disease diagnosed through breast screening.

Methods: We analysed individual-level data from 778 306 women aged 50–69 years with at least one mammographic screening participation in ten Breast Cancer Screening centres in Spain from 1996 to 2015 and followed-up until 2017. We compared crude and adjusted rates of incident breast cancer among women with and without benign breast disease. We calculated crude and adjusted rate ratios to compare both groups. Poisson regression was used for adjusted analyses.

Results: By December 2017, 242 557 women had been followed for up to 4 years, 179 167 for 5–8 years, 188 399 for 9–12 years, 150 356 for more than 12 years. Over the study period, 17 827 women were diagnosed with benign breast disease and 11 708 women had an incident breast cancer, corresponding to an incidence rate of 14.8 (95% CI 14.5 to 15.1) per 1000 women among those without a benign breast disease; and 24.8 (95% CI 22.6 to 27.2) among those with a benign breast disease. Women with benign breast disease had an overall increased relative risk of 1.77 (95% CI: 1.61 to 1.95). The excess risk in women with benign breast disease remained increased over time, with relative risk 1.99 (95% CI: 1.73 to 2.29) for those followed less than 4 years, to 1.96 (95% CI: 1.32 to 2.92) for those followed 12 to 20 years. The excess incidence risk was independent of year at mammography or age at mammography.

Table: Crude and adjusted rate ratios of incidence breast cancer in women with benign breast disease at screening, according to year, age, and time since index mammogram.

<table>
<thead>
<tr>
<th>Year since index mammogram</th>
<th>No Benign Breast Disease Cases/Women</th>
<th>Benign Breast Disease Cases/Women</th>
<th>Crude Ratio (95%CI)</th>
<th>Adjusted Ratio (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years</td>
<td>4096/242 557 2017/175 582</td>
<td>1.84 (1.61–2.09) 1.68 (1.47–1.91)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>5042/237 613 156/3 985</td>
<td>1.84 (1.57–2.16) 1.57 (1.34–1.85)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>7152/319 947 128/4 976</td>
<td>1.93 (1.62–2.30) 1.95 (1.64–2.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 years</td>
<td>733/194 082 636/3 999</td>
<td>2.61 (2.02–3.37) 3.11 (2.41–4.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at index mammogram</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50–54</td>
<td>6477/455 833 233/8 926</td>
<td>1.84 (1.61–2.09) 1.68 (1.47–1.91)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55–59</td>
<td>2938/146 256 107/3 773</td>
<td>1.41 (1.16–1.71) 1.53 (1.26–1.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60–64</td>
<td>1645/118 008 79/3 152</td>
<td>1.80 (1.43–2.25) 2.38 (1.90–2.98)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65–69</td>
<td>2064/40 382 231/9 767</td>
<td>2.28 (1.48–3.51) 3.25 (2.11–5.00)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: Women with benign breast disease experienced higher long-term risks of breast cancer than women with negative screens for two decades. Women with benign breast disease could benefit from closer surveillance and more personalised screening strategies.

No conflict of interest.
Background: Over the last decades, it has been repeatedly suggested that psychosocial factors such as depression and anxiety increase the risk of breast cancer, through mechanisms such as mutation, DNA repair, neuroendocrine processes, immunological processes, or unhealthy behaviours. With individual participant data meta-analyses, we aimed to test whether depression, anxiety, recent loss event, and perceived social support increase the risk for breast cancer. We also explored the effects of neuroticism, general distress, and relationship status.

Materials and methods: IPD meta-analyses were performed with up to twenty-two studies in the PSY-CA consortium (up to: N = 220,258, person years = 2,902,822, breast cancer incidences = 57,24). At stage 1, Cox regression models were fitted in each cohort for each psychosocial factor (outlined above) and breast cancer outcome. Two models were tested: a minimally-adjusted model (correcting for sociodemographic covariates) and a maximally-adjusted model (including potential confounders such as parity). At stage 2, hazard ratios (from stage 1) were pooled using random-effects meta-analyses.

Results: Most psychosocial factors were not related to breast cancer incidence, with the exception of anxiety symptoms which showed a protective effect (HR = 0.95 [0.91, 0.998], p = 0.04) in the minimally adjusted model. When adjusting for breast aminat (ITT), this effect was no longer statistically significant (HR = 0.96 [0.90, 1.02], p = 0.14). Further research is needed to test whether health-related behaviours, such as unhealthy behaviours or menopausal status, moderate the association between psychosocial factors and breast cancer.

Conclusions: The REBECCA intervention did have positive effects on several psychological and physical outcomes. The REBECCA intervention improved symptoms of depression, breast cancer related quality of life and to some extent anxiety. Socially vulnerable sub-groups may have the largest benefit. Our findings merit further research to refine the nurse navigation framework further.

No conflict of interest.

12 (PB-008) Poster Discussion
Effectiveness of a nurse-navigation intervention in vulnerable breast cancer patients – The Rebecca Study
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1Danish Cancer Society Research Center, Survivorship Unit, Copenhagen, Denmark; 2Copenhagen University Hospital, Breast Surgery, Hellerup, Denmark

Background: Women with breast cancer may suffer from adverse effects of treatment including psychological distress, anxiety, and depression as well as physical symptoms such as pain and fatigue. Despite available rehabilitation services breast cancer patients still report unmet needs for support.

The aim of this study was to evaluate the effectiveness of the REBECCA intervention combining nurse navigation and systematic screening for psychological and physical symptoms in vulnerable breast cancer patients using a randomized controlled design.

Material and Methods: Between 2017–2019 all eligible patients were invited consecutively to participate in the study by a project nurse. Enrolled patients reporting moderate to severe distress at baseline were randomized using a computer-generated assignment 1:1 to either standard care or to the REBECCA intervention. The intervention comprised repeated screening using patient reported outcome measures and up to 6 individual nurse navigation sessions providing psychoeducation, support, and referrals to symptom management.

Questionnaire data was collected at baseline before surgery and at 6, 12 and 18 months after. Primary outcome was distress. Secondary outcomes were e.g., anxiety, depression, and breast cancer specific health related quality of life (HQLoL). When adjusting for breast cancer (ITT), we applied linear mixed regression models with 95% confidence intervals to examine the effect of the intervention on primary outcomes at the four time points. Effect sizes were evaluated using Cohen’s d.

Results: We identified 309 vulnerable patients with breast cancer who were randomly assigned to the intervention (N = 153) or the control (N = 156). Overall intervention effects were seen for depression (p = 0.037) and breast cancer specific HQLoL (p = 0.03) and a borderline significant intervention effect was seen for anxiety (p = 0.062) with strongest effects at either 6 or 12 months follow-up.

Larger effects were seen in adjusted analyses. Patients receiving the REBECCA intervention, compared to standard care had significantly reduced symptoms of distress at 12 months follow-up in the adjusted analyses. Furthermore, significant effects were seen in adjusted analyses for symptoms of anxiety at 6, 12 and 18 months, depression at 6 months, HQLoL at 6 and 12 months and for fear of recurrence at 6 and 12 months. The effects were modified by age, patient activation, education, and social support.

Conclusions: The REBECCA intervention did have positive effects on several psychological and physical outcomes. The REBECCA intervention improved symptoms of depression, breast cancer related quality of life and to some extent anxiety. Socially vulnerable sub-groups may have the largest benefit.

No conflict of interest.

13 (PB-009) Poster Discussion
External validation and clinical utility assessment of PREDICT v2.2 prognostic model in young, node-negative, systemic treatment-naive breast cancer patients
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Background: The PREDICT breast prognostic model is widely used by oncologists for decision-making about systemic treatment for breast cancer patients. However, whether PREDICT could provide accurate predictions before systemic treatment in young patients remains unclear. This study assessed the validity and clinical utility of the latest version of PREDICT (v2.2) in young, node-negative, breast cancer patients who did not receive systemic treatment.

Methods: We selected all women from the Netherlands Cancer Registry, diagnosed with node-negative breast cancer under 40 years of age between 1989 and 2000; a period when national guidelines did not recommend the use of systemic treatment for node-negative patients. The validity of PREDICT to predict all-cause mortality was assessed through calibration and discrimination, calculated as the ratio of observed and expected all-cause mortality (O/E), and the area under the receiver-operating-characteristic-curve (AUC) at 10 years, respectively. Clinical utility of PREDICT was evaluated using decision curve analysis and compared to the clinical utility of the European Society of Medical Oncology (ESMO) guideline. Predefined thresholds for estrogen receptor (ER)-positive and ER-negative patients were based on the MINdACT trial, where adjuvant chemotherapy was recommended to patients with a predicted 10-year all-cause mortality ≥8% (ER-negative) or ≥12% (ER-positive). Clinical utility was represented by net benefit, calculated as the rate of correctly predicted high-risk patients who should receive chemotherapy minus the weighted (odds of the threshold) rate of falsely predicted high-risk patients who should not receive chemotherapy.

Results: We included 2,264 patients with a median age at diagnosis of 36 years. Most patients had ER-positive (70.9%), and grade 1–2 tumors (56.2%); the median tumor size was 16 mm. Observed 10-year all-cause mortality for all patients was 32% higher than the predicted value (table), which was likely due to earlier years of diagnosis of the study population compared to the PREDICT derivation cohort. PREDICT had a 65% chance (AUC) to correctly separate patients who would and would not die within 10 years. Compared to the ESMO guideline, PREDICT only showed slightly higher net benefit in ER-positive patients.

No conflict of interest.
Further investigation of interval cancer and subsequent round cancer identifying additional malignant lesions that appear to be clinically significant.

Bilateral screening breast US reduced by 55% in the year after routine CEM was implemented.

The results of the effectiveness of population-based screening are controversial in terms of the balance between mortality reduction and adverse effects. In order to improve it, studies have proposed personalized screening strategies based on woman's individual breast cancer (BC) risk.

**Conclusion:** Interim data shows strong analytical and clinical performance of the test for detection of active breast cancer as well as identification of those negative for breast cancer particularly women under 50 and those with small tumors and disease-free lymph nodes, supporting a potential role of the test as a screening option to supplement imaging approaches.

**Table 1: Clinical Performance Metrics**

<table>
<thead>
<tr>
<th>Age</th>
<th>Participants (n)</th>
<th>Accuracy</th>
<th>Specificity</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>Normal: 192</td>
<td>98.5%</td>
<td>99.9%</td>
<td>91.7%</td>
</tr>
<tr>
<td></td>
<td>Cancer: 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire</td>
<td>cohort Normal: 599</td>
<td>92.2%</td>
<td>94.3%</td>
<td>79.2%</td>
</tr>
<tr>
<td>Cancer: 96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Conflict of interest:**
Ownership: Kenneth Fuh, Robert Shepherd and Kristina Rinker are co-founders and partly own Syantra Inc.
Board of Directors: Robert Shepherd and Kristina Rinker are members of Syantra’s Board of Directors.
and followed up until 2022. We used partly conditional Cox regression to estimate the adjusted hazard ratios (aHR) and the 95% confidence intervals (95%CI) for age, breast density, family history of BC, body mass index (BMI), age at menarche, alcohol habit, exercise, pregnancy, hormone replacement therapy (HRT) and benign breast disease (BBB). We calculated the 4-year absolute BC risk estimates, we validated the model using bootstrap resampling by means of the Expected-to-Observed ratio (E/O) and the area under the ROC curve (AUC) and we plotted the effect of each variable in the risk estimation.

**Results:** Our results showed that all the variables included in the model explained part of the variability in BC risk. The 4-year BC risk varied between 0.22% and 7.43% with a median of 1.10%. The model slightly overestimated the risk with an E/O of 1.10 (95%CI: 1.09–1.11) and the AUC was 62.9% (95%CI: 60.8%–65.2%). Breast density was the variable that had a higher effect in the model.

**Conclusion:** We developed and validated a risk prediction model to estimate the 4-year risk of BC in women eligible for mammography screening. All the ten variables used were found to significantly explain part of the variability in the BC risk. The model slightly overestimated the risk and had a similar discriminatory power than the usual BC risk prediction models. The model could be used to create individualized screening strategies aimed at improving the risk-benefit balance of mammography screening programs.

<table>
<thead>
<tr>
<th>aHR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 1.01 (1.00–1.03)</td>
</tr>
<tr>
<td>BMI 1.06 (1.04–1.08)</td>
</tr>
<tr>
<td>Age at menarche 0.95 (0.91–1.00)</td>
</tr>
<tr>
<td>Breast density (VDG) 0.59 (0.51–0.69)</td>
</tr>
<tr>
<td>1 0.59 (0.51–0.69)</td>
</tr>
<tr>
<td>2 Ref.</td>
</tr>
<tr>
<td>3 1.37 (1.20–1.56)</td>
</tr>
<tr>
<td>4 1.71 (1.33–2.20)</td>
</tr>
</tbody>
</table>

**Family history of BC**

<table>
<thead>
<tr>
<th>aHR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Ref.</td>
</tr>
<tr>
<td>2nd degree 1.17 (0.98–1.41)</td>
</tr>
<tr>
<td>1st degree 1.34 (1.10–1.63)</td>
</tr>
</tbody>
</table>

**Benign breast disease**

<table>
<thead>
<tr>
<th>aHR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Ref.</td>
</tr>
<tr>
<td>Self-reported 1.55 (1.31–1.83)</td>
</tr>
<tr>
<td>Clinician-reported 1.42 (1.02–1.98)</td>
</tr>
</tbody>
</table>

**Alcohol habit/month**

<table>
<thead>
<tr>
<th>aHR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No 0.94 (0.76–1.16)</td>
</tr>
<tr>
<td>&lt;6 units Ref.</td>
</tr>
<tr>
<td>6–10 units 1.06 (0.88–1.28)</td>
</tr>
<tr>
<td>&gt;10 units 1.14 (0.96–1.36)</td>
</tr>
</tbody>
</table>

**Exercise/week**

<table>
<thead>
<tr>
<th>aHR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Ref.</td>
</tr>
<tr>
<td>&lt;1 h 0.80 (0.67–0.96)</td>
</tr>
<tr>
<td>2–3 h 0.83 (0.70–0.97)</td>
</tr>
<tr>
<td>&gt;4 h 0.85 (0.71–0.93)</td>
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</table>

**Pregnancy**

<table>
<thead>
<tr>
<th>aHR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No 1.10 (0.88–1.38)</td>
</tr>
<tr>
<td>1 or 2 Ref.</td>
</tr>
<tr>
<td>&gt;3 0.91 (0.79–1.04)</td>
</tr>
</tbody>
</table>

**HRT**

<table>
<thead>
<tr>
<th>aHR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Ref.</td>
</tr>
<tr>
<td>Yes 1.30 (1.13–1.48)</td>
</tr>
</tbody>
</table>

**No conflict of interest.**

**Material and methods:** The effect of behavioral graded activity on physical activity level, 23 (PB-023) symptom management in cancer patients and survivors: systematic review and meta-analysis

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**Background:** In past years, behavioral graded activity (BGA) has demonstrated positive effects on debilitated symptoms, physical functioning, and pain in chronic pain populations, and appears foremost in cognitive behavioral therapy or other psychological informed practices (PiP). Up to now, no systematic review has been published about the effect of BGA on different biopsychosocial outcomes within cancer populations. Therefore, this systematic review and meta-analysis determined the effectiveness of BGA compared to (1) waitlists (WL), (2) usual care (UC), (3) PiP alone, or (4) BGA alone in cancer patients and survivors (CPaS).

**Material and methods:** PiP and BGA were systematically screened for randomized controlled trials encompassing BGA (e.g., graded activity, graded exercise, operant conditioning) and PiP (e.g., acceptance commitment therapy, behavior strategies, cognition therapy, cognitive behavioral therapy) in CPaS. Effect sizes were inventoried for outcomes regarding physical activity, quality of life (QoL), and debilitating symptoms. The quality of the evidence was classified by the GRADE approach. Subgroup analyses were undertaken based on the methodological quality and quality of the given BGA to reduce heterogeneity (I2 > 50%).

**Results:** Thirty-three studies were found eligible (n = 4,330). Significant effects of PiP+BGA comparing to WL were found for anxiety (SMD: −1.29 [−1.71; −0.86], I2 = 0%), fatigue (SMD: −0.86 [−1.18; −0.54], I2 = 61%), depression (SMD: −0.79 [−1.10; −0.48], I2 = 0%), functional impairment (SMD: −0.72 [−0.95; −0.50], I2 = 0%), psychological distress (SMD: −0.58 [−0.82; −0.34], I2 = 51%), physical activity (self-reported SMD: −0.58–0.84–0.32], I2 = 47% and objectively measured SMD: −0.51 [−0.90; −0.13], I2 = 55% QoL (SMD: −0.38 [−0.68; −0.09], I2 = 51%), social impairment (SMD: −0.33 [−0.58; −0.08], I2 = 0%) and only the psychological distress (SMD: −0.39 [−1.76; −0.02], I2 = 82%) remained significantly after 1 to 3 months. When PiP+BGA to UC, significant effects were found for anxiety (SMD: −0.47 [−0.88; −0.06], I2 = 83%), depression (SMD: −0.46 [−0.84; −0.09], I2 = 82%), fatigue (SMD: −0.35 [−0.51; −0.20], I2 = 48%), and physical activity (SMD: −0.26 [−0.41; −0.11], I2 = 44%). After 2 to 1 months, anxiety (SMD: −0.54 [−2.88; −0.21], I2 = 87%), depression (SMD: −1.43 [−2.46; −0.39], I2 = 89%) and fatigue (SMD: −0.34 [−0.56; −0.10], I2 = 47%) remained significantly. These significant effects were not observed in the meta-analyses of studies comparing PiP+BGA to BGA or PiP alone.

**Conclusions:** PiP with BGA had a favorable effect on debilitating symptoms, physical activity, and QoL in CPaS when compared to no interventions and usual care. However, further research is needed on ‘how and when’ BGA should be provided in cancer rehabilitation.

**No conflict of interest.**

**25 (PB-025) Poster Spotlight Impacts of pre-existing cardiometabolic diseases on cancer stage at diagnosis in the EPIC study**

A. Jansana1, V. Viallon2, C. Blessy2, E. Fontvieille2, A. Auguste3, M. Kvaskoff3, P. Ferrari2, H. Freising2, EPIC collaborators. 1Postdoctoral Researcher, Nutrition and Metabolism Branch NME, International Agency for Research on Cancer IARC, Lyon, France; 2International Agency for Research on Cancer IARC, Nutrition and Metabolism Branch, Lyon, France; 3Institut Gustave Roussy, Esposaway, Heredity, Cancer and Health, Paris, France

**Background:** Evidence suggests that participation in cancer screening may be lower among individuals with type 2 diabetes (T2D) or cardiovascular diseases (CVD) diagnosed prior to cancer compared to individuals with cancer without cardiometabolic diseases. Therefore, cardiometabolic diseases may lead to late cancer detection and advanced stage at diagnosis. This study aimed to investigate whether pre-existing cardiometabolic diseases are associated with stage at cancer diagnosis.

**Material and methods:** Within the European Prospective Investigation Into Cancer and Nutrition cohort (EPIC), incident localised and metastatic cancers were diagnosed between 1992 and 2012. Participants with incident diagnosis of cardiometabolic diseases, including CVD and T2D, prior to cancer were identified. Multi-variable adjusted logistic regression was used to estimate odds-ratios (OR) and 95% confidence intervals (CI) of diagnosis of metastatic cancer according to the presence of CVD, T2D, both or no cardiometabolic disease among EPIC participants diagnosed with cancer. Analyses were carried out for all cancers combined and separately for screened cancers (breast and colorectal cancer) and non-screened cancers.

**No conflict of interest.**
(all cancers except breast and colorectal cancer) based on the availability of population-based cancer screening programs in Europe.

**Results:** Of the 11,945 incident cancers, 4.8% were diagnosed with CVD, 7.1% with T2D and 1.3% were diagnosed with both CVD and T2D. When we excluded screenable cancer sites from our sample, we observed that individuals with T2D were more likely to be diagnosed with metastatic cancer at diagnosis compared to individuals with neither T2D nor CVD (OR 1.26, 95% CI 1.04–1.55).

**Conclusions:** These findings suggest an increased risk of advanced tumour stage at diagnosis, particularly for non-screenable cancers, among individuals with pre-existing T2D. The results underline the importance of encouraging participation of the eligible population in screening programmes by healthcare professionals and pay special attention to individuals with pre-existing cardiometabolic diseases.

**Table 1:** Association of pre-existing cardiometabolic comorbidities and cancer stage at diagnosis

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Comorbidities</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-screened cancers (N = 7400)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2D &amp; CVD</td>
<td>74</td>
<td>0.93</td>
<td>(0.63–1.38)</td>
</tr>
<tr>
<td>Colorectal cancer (N = 1722)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2D &amp; CVD</td>
<td>74</td>
<td>0.93</td>
<td>(0.63–1.38)</td>
</tr>
<tr>
<td>CVD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No CM</td>
<td>73</td>
<td>0.68</td>
<td>(0.29–1.59)</td>
</tr>
</tbody>
</table>

No conflict of interest.

**POSTER SESSION 16 November 2022**

**Follow up**

**30 (PB-033)**

**Poster**

Oncoprene20 study: Patients’ perception of telemedicine in the COVID-19 pandemic during follow-up visits for gynecological and breast cancers

E. Picardo, A. Testa, M. G. Bau, A. Mandino, A. Surace, F. Gallo, C. Anatore, S. Danese, M. Milteni. 1AOU Città della Salute e della Scienza di Torino, Breast Unit, Torino, Italy; 2AOU Città della Salute e della Scienza di Torino, Breast Unit, Torino, Italy; 3University of Turin, Surgical Sciences, Torino, Italy; 4Local Health Authority 1, Epidemiology Unit - Health Direction, Cuneo, Italy

**Objective:** To analyze oncological patients’ perception of telemedicine during the COVID-19 pandemic.

**Methods:** A total of 345 women, of whom 267 experienced breast cancer and 78 experienced a gynecological cancer, were enrolled. Specific questionnaires about their experiences and feelings about telemedicine in the COVID-19 era were collected.

**Results:** In the breast group, “enhanced care” showed moderate positive perception (mean 4.40) among less-educated women that was slightly lower among better-educated women (mean 4.14) with a significant difference (P = 0.034). “satisfaction” had an opposite pattern: a mean of 3.99 for a lower level of education and 4.76 for a higher level of education, with a strong significant difference (P < 0.001). “privacy and discomfort” approached neutrality for less-educated women, while for higher-educated women the lower mean of 2.93 indicated a more positive perception (P = 0.007). In the pelvic group, younger women had a better perception towards telemedicine for “telemedicine as a substitution” (mean 3.68) compared to older women (mean 3.05). The privacy and discomfort subscale was in favor of better-educated women (mean 2.57) compared to less-educated women (mean 3.28, P = 0.042).

**Conclusion:** Telemedicine was generally well accepted, not only among younger and higher-educated women but also by women needing intensive care, in both cancer groups.

No conflict of interest.

**31 (PB-031)**

**Poster**

Routine and interval detection of locoregional breast cancer recurrences and risk of subsequent distant metastases: a population-based study

A. Elkeijbopm, L. de Munck, M. de Vries, A.B. Franken, M. Hendriks, L. Strobbe, A. Witteveen, M. van Maaren, S. Siesling. 1Netherlands comprehensive cancer organisation IKKNL, Department of Research and Development, Utrecht, Netherlands; 2University of Twente, Department of Health Technology and Services Research- Technical Medical Centre, Enschede, Netherlands; 3Isala Clinics, Department of Surgical Oncology, Zwolle, Netherlands; 4Northwest Clinics, Department of Medical Oncology, Alkmaar, Netherlands; 5Canisius Wilhelm Hospital, Department of Surgical Oncology, Nijmegen, Netherlands; 6University of Twente, Department of Biomedical Signals and Systems- Technical Medical Centre, Enschede, Netherlands

**Background:** The benefits of routine visits, i.e. planned surveillance visits, remain debatable for breast cancer survivors. Therefore, the current study aimed to compare the severity of the locoregional recurrence (visits, number of surgical interventions, and other health-related outcomes) between patients diagnosed with locoregional breast cancer and the risk of subsequent distant metastases (DM) between LRRs detected at routine and interval visits.

**Methods:** Women diagnosed with early breast cancer (T1-3N0/NoM) between 2003 and 2008 in one of the 15 participating hospitals, and who developed a LRR as first event after primary treatment, were selected from the Netherlands Cancer Registry (n = 222, cohort A). Chi-squared tests were used to compare the severity of routine- and interval-detected local recurrences (LR) and regional recurrences (RR). Data on the development of subsequent recurrences after a first LRR was available for a subset of patients (n = 127, cohort B). Cohort B was used to calculate cause-specific hazard ratios (HR) and 95% confidence intervals (CI), estimating the association between way of LRR detection and risk of a subsequent DM. Cause-specific HRs take the development of competing events (i.e. death, second primary cancer, or second LRR) into account. Patients were censored at the development of a competing event or at the date of last observation. The analysis was adjusted for size, grade, number of positive lymph nodes, and type of surgery of the primary tumor, and grade and number of positive lymph nodes of the LRR.

**Results:** A total of 109 patients had a routine-detected LRR (49.1%) and 113 patients had an interval-detected LRR (50.9%). Interval-detected LRs were more often smaller than routine-detected LRs, although not significant (p = 0.06). Tumor grade did not differ between interval-detected LRs and routine-detected LRs (p = 0.84). Tumor grade and number of positive lymph nodes did not differ between interval-detected RRs and routine-detected RRs (p = 0.32, p = 0.67, respectively). In cohort B, median time between diagnosis of the primary tumor and diagnosis of the LRR was 3.8 years (IGR: 2.1–6.3) for routine-LRR patients and 3.3 years (IGR: 2.3–6.0) for interval-LRR patients. Median time from diagnosis of the LRR to a DM, competing event, or last observation was 2.8 years (IGR: 1.2–5.4) for routine-LRR patients and 2.9 years (IGR: 0.9–5.8) for interval-LRR patients. After adjustment, way of detection of the LRR was not associated with the risk of developing a subsequent DM (HR: 1.22; 95% CI: 0.49–3.08).

**Conclusions:** We found no association between way of detection of the LRR and severity of the LRR or the risk of a subsequent DM. It could therefore be suggested to reduce the number of follow-up visits. However, reduction in the number of surveillance visits should always be done in shared decision with the patient and should be accompanied by self-examination instructions.

No conflict of interest.
Within 6 months after surgery, breast cancer patients experience the most frequent and significant shoulder morbidities due to surgery and adjuvant therapy. However, the extent of shoulder impairment, as well as patterns of recovery within 6 months after surgery, is not fully understood. More importantly, variances in shoulder range of motion (ROM) and strength according to the types of surgery are not yet fully understood. Therefore, we aimed to investigate the pattern of recovery shoulder ROM, strength, and the capabilities of the arm, shoulder, and hand (DASH) after breast cancer surgery for up to 6 months.

Material and methods: A total of 70 breast cancer patients were observed seven times from the day before surgery to 6 months post-surgery participants [1st: the day before surgery (baseline), 2nd: Post-operative day (POD)1, 3rd: POD7-10 (1st outpatient visit), 4th: POD14-20 (2nd outpatient visit), 5th: POD 21–30 (3rd outpatient visit), 6th: 3 months after surgery (4th outpatient visit), 7th: 6 months after surgery (5th outpatient visit)]. At each observation, we measured shoulder function (ROM and strength in both arms). DASH.

Results: The ROM in the affected side was significantly reduced immediately after surgery and gradually recovered. However, ROM recovered only up to 87% and 89% of pre-surgery levels at 3 months and 6 months after surgery, respectively. On the other hand, the shoulder strength of both affected and unaffected arms was regained regardless of surgery type. The affected side was significantly reduced immediately after surgery and gradually recovered, while the opposite side continually declined over 6 months. In addition, The DASH score was significantly increased after surgery (8.5 ± 13.0 at baseline vs. 36.8 ± 15.5 at POD 10; p < 0.001) and gradually declined (13.5 ± 15.0, p between baseline<0.001). When the DASH score was analyzed according to types of surgery, participants who underwent TM showed a tendency to increase their DASH score more rapidly than participants who underwent PM, but there was no interaction between surgery type and time.

Conclusion: These results provide preliminary evidence for understanding the recovery pattern of shoulder function after breast cancer surgery. Our findings suggest that rehabilitation exercises should be implemented in both upper limbs.

No conflict of interest.

34 (PB-034) Poster The effectiveness of personalised surveillance and aftercare in breast cancer follow-up: a systematic review

M. van Maaren 1, J. van Hoeve 1, J. Poorthuis 2, J. Korevaar 2, C. Drossaert 2, S. Siesling 3, Netherlands Comprehensive Cancer Organisation IKNL, Department of Research and Development, Utrecht, Netherlands; 1University of Twente, Department of Health Technology and Services Research, Technical Medical Centre, Enschede, Netherlands; 3Netherlands Institute for Health Services Research NIVEL, Department of Research, Utrecht, Netherlands

Background: Currently, breast cancer follow-up significantly differs among hospitals, varying from one-size-fits-all to more personalised approaches. Before starting a prospective study on the effect of personalised breast cancer follow-up in the Netherlands on cancer worry and cost-effectiveness, we performed a systematic review to get insight in existing evidence on its effectiveness.

Methods: Scopus (including Medline and keywords of Embase) and Cochrane (reviews) were searched for relevant publications between 1 January 2010 and 8 April 2021. The inclusion population consisted of non-metastatic breast cancer patients ≥18 years after completing curative treatment. The search included all synonyms of ‘breast cancer’, ‘personalised’, ‘follow-up’ and ‘survivor’. We only included individualised interventions designed for use in the entire period after treatment (except endocrine therapy). Studies investigating short-term dietary, physical interventions or cognitive therapy were therefore excluded. We also excluded studies on diagnostic accuracy or feasibility, patient experiences and studies without and control group. Two reviewers independently screened all publications on title and abstract. In case of doubt, the publication was included. One reviewer extensively reviewed the included publications while consulting the second reviewer in case of doubt.

Results: In total, 2343 publications were obtained from Scopus, and 26 reviews from Cochrane. We included 36 publications for full text analysis. Six studies (all randomised trials) were deemed useful for review. Using the Cochrane risk-of-bias tool, four studies were judged low risk, one high risk and one with concerns. All studies varied in populations, intervention and outcomes. Two studies found improved QoL after patient navigation or individualised follow-up, while one study found no significant differences in breast cancer and patient satisfaction. The latter showed a low level of consultations in the intervention group. One study found that survivorship care plans led to improved survivor knowledge, while another showed that these plans did not lead to changes in number of redundant examinations. One study showed that integration of online questionnaires with remote review facilitated symptom reporting. None of the studies analysed cancer worry or cost-effectiveness. Moreover, none evaluated numbers of recurrences when the number of visits changed and none included information on the organisation of follow-up.

Conclusions: Many studies underlined the need for personalised follow-up, but its effect on cancer worry, follow-up visits, recurrences and cost-effectiveness is still unclear. A prospective study with at least three year follow-up, including both patient-reported and qualitative outcomes, which provides attention to the organisation of follow-up, will provide better insights in its effectiveness.

No conflict of interest.

35 (PB-035) Poster Factors affecting Quality of Life among breast cancer survivors

A. Fatima 1, S. Shaunak Khanum Cancer Hospital, Surgical Oncology, Lahore, Pakistan

Background: Many breast cancer patients experience various levels of distress immediately following the completion of primary treatment. Women who report low levels of quality of life (QOL) early in this phase of transitional survivorship tend to experience diminished long-term adjustment. However, the studies related to QOL of women during the end of primary treatment have been found insufficient. This study aimed to identify determinants of QOL in women with breast cancer immediately following the completion of treatment.

Methods: A cross-sectional study was conducted on 195 disease-free breast cancer patients who had completed therapy in the past 1 month. Functional Assessment of Cancer Therapy-Breast (FACT-B), Memorial Symptom Assessment Scale-Short Form (MSAS-SF), Self-Efficacy Scale for Self-Management of Breast Cancer (SESMM-B), and Interpersonal Support Evaluation List-12 (ISEL-12) scale were used to assess psychological, social, and physical well-being, respectively. The data were analyzed using the Pearson correlation, t-test, ANOVA, and hierarchical multiple regression.

Results: The mean score of QOL for breast cancer survivors was 97.23 (±20.01). Chemotherapy and perceived economic status were significantly associated with QOL in terms of sociodemographic and disease/treatment-related characteristics. Physical and psychological symptoms and social support had a significant association with QOL. The regression analyses showed that physical and psychological symptoms and belonging support were statistically significant in predicting the QOL of breast cancer survivors.

Conclusions: The variables of symptom experience and social support must be acknowledged when improving women’s QOL immediately after their completion of primary breast cancer treatment. Greater focus on the reduction of symptom distress and increasing a sense of belonging could improve QOL among breast cancer survivors. We propose conducting a follow-up study to evaluate QOL according to the level of interaction between the treatment regimen and symptom experience in patients with breast cancer immediately after the completion of primary treatment.

No conflict of interest.

36 (PB-036) Poster Second primary cancer risks for female and male breast cancer survivors in England

I. Allen 1, T. Rahman 2, A. Bacon 3, C. Knots 2, S. Jose 2, S. Vernon 2, H. Hassan 2, C. Huntley 3, L. Loong 1, Y. Walburga 1, K. Lavelle 3, E. Morris 4, A. Hardy 5, B. Torr 5, D. Eccles 1, C. Turnbull 1, M. Tischkowitz 1, P. Pharoah 1, A.C. Antoniou 1, 1University of Cambridge, Department of Public Health and Primary Care, Cambridge, United Kingdom; 2Health Data Insight CIC, Health Services Research Unit, University of Cambridge, Cambridge, United Kingdom; 3Institute for Health Research-Cambridge Biomedical Research Centre, University of Cambridge, Department of Medical Genetics, Cambridge, United Kingdom

Abstracts, EBCC-13
Background: Second primary cancer (SPC) incidence is significantly increased following breast cancer (BC) diagnosis, but the magnitudes of these risks remain unclear. We estimated SPC risks following BC separately for males and females based on comprehensive data from linkage of National Cancer Registration and Analysis (NCRAS) and Hospital Episode Statistics (HES) electronic health records in England.

Material and methods: The retrospective cohort contained 873,292 females and 5,824 males who were first diagnosed with BC in England between 1995 and 2019, excluding those diagnosed by death certificate only. We calculated overall and site-specific SPC standardized incidence ratios (SIRs) by comparing observed and expected SPC counts among the cohort. The study participants were followed from BC diagnosis until the first of a SPC diagnosis (excluding ipsilateral breast and non-melanoma skin cancers), death, migration, and study end. Follow-up for bladder, breast, colon, ovarian, prostate, rectum or uterine primaries was also censored one year after certain surgeries. Expected SPC counts were calculated using cancer incidence rates in the general English population, accounting for calendar year, cancer site, age, and sex. Observed counts were divided by expected counts to obtain the SIRs. We stratified the SIRs by age group at BC diagnosis, sex, and SPC site.

Results: There were 80,070 and 909 incident SPCs following BC among females and males respectively. There was a significant increase in the risk of all cancers combined following BC in women (SIR: 1.08, 95%CI: 1.07–1.09). The most increased SPC risks were for contralateral breast (SIR: 1.57, 95%CI: 1.55–1.59) and uterine (SIR: 1.56, 95%CI: 1.53–1.60) cancer. However, there was wide variation in SPC risks by age. The risk at all sites combined was higher for women first diagnosed with BC before the age of 50 (SIR: 1.56, 95%CI: 1.53–1.59) compared to women diagnosed with BC aged 50 or over (SIR: 1.02, 95%CI: 1.01–1.03). For women diagnosed under age 50, contralateral breast (SIR: 2.69, 95%CI: 2.62–2.76), uterine (SIR: 1.58, 95%CI: 1.48–1.68) and ovarian (SIR: 1.57, 95%CI: 1.45–1.68) cancer risks were statistically significant. Men diagnosed with BC were at increased risk of SPCs at all sites combined (SIR: 1.12, 95%CI: 1.05–1.19). There were increased risks of contralateral BC (SIR: 4.24, 95%CI: 2.98–5.96) and prostate cancer (SIR: 1.40, 95%CI: 1.25–1.54).

Conclusion: This is the largest study to date to assess SPC risks following BC in either men or women. Both males and females were at significantly increased risk of SPCs following BC, both in combination and at specific sites. These findings could help guide clinical management after BC diagnosis. Further analysis is underway to look into the effects of chemotherapy, radiotherapy, hormonal therapy, comorbidities, or BC germ-line susceptibility on SPC risks.

No conflict of interest.

37 (PB-037) Poster
Effect of nodal status before and after neoadjuvant chemotherapy on prognosis in breast cancer: a Dutch population-based study
S. De Witte1,2, L. Koppert3, M.J. Vanrancen Peeters4,5, S. Siesling6,7, M. Smidt1, J. Simons8, 1Maastricht University Medical Centre+, Department of Surgery, Maastricht, Netherlands; 2GROW, School for Oncology and Reproduction, Maastricht, Netherlands; 3Erasmus Medical Centre, Department of Surgery, Rotterdam, Netherlands; 4Netherlands Cancer Institute, Department of Surgery, Amsterdam, Netherlands; 5Amsterdam University Medical Centre, Department of Surgery, Amsterdam, Netherlands; 6Technical Medical Centre- University of Twente, Department of Health Technology and Services Research, Enschede, Netherlands; 7Netherlands Comprehensive Cancer Organisation IKNL, Department of Research and Development, Utrecht, Netherlands; 8Erasmus Medical Centre, Department of Radiotherapy, Rotterdam, Netherlands

Background: Neoadjuvant chemotherapy (NAC) is increasingly applied in breast cancer. We compare the nodal status, and can even result in a pathological complete response (pCR, ypN0). Since nodal status is an important prognostic factor, this challenges staging and treatment strategies. This Dutch population-based study was conducted to determine the prognostic effect of nodal status before and after NAC.

Materials and methods: Women with invasive breast cancer, no distant metastases, and treated with NAC and surgery of the breast and axilla, were selected from the Netherlands Cancer Registry if diagnosed between January 1, 2005, and December 31, 2019. They were assigned to one of three groups based on nodal status before NAC: node negative (cN0), node positive (cN+) based on sentinel lymph node biopsy (SLNB), or cN+ based on biopsy (i.e., fine needle aspiration or core needle biopsy). We performed Kaplan-Meier survival analyses to assess 5-year overall survival (OS) for each group, taking into account nodal status after NAC (i.e., ypN-status), and the log rank-test to compare the outcomes.

Results: A total of 22,298 patients were included. Median follow-up was 5.2 years. The cN0 (biopsy) group (N = 11,851) had a statistically significant worse 5-year OS (81.5%, 95%-CI 80.7–82.2) compared to the cN0 (group (N = 9,073, 93.2%, 95%-CI 92.6–93.7, p < 0.0001) and cN+(SLNB) group (N = 1,374, 92.6%, 95%-CI 91.1–93.9, p < 0.0001). Within each group, nodal residual disease after NAC (i.e., ypN+) resulted in a statistically significant worse OS compared to ypN0, as presented in Table 1. The cN+(biopsy)/ypN0 subgroup had a statistically significant worse 5-year OS (89.7%, 95%-CI 88.7–90.7) compared to the cN0/ypN0 subgroup (94.5%, 95%-CI 93.9–95.0, p < 0.0001) and cN+(SLNB)/ypN0 subgroup (96.3%, 95%-CI 92.7–98.1, p < 0.003).

Table 1: Five-year OS per cN/ypN subgroup

<table>
<thead>
<tr>
<th>cN0 (N = 9,073)</th>
<th>ypN0 (N = 7,800)</th>
<th>ypN+ (N = 1,273)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>94.5 [93.9–95.0]</td>
<td>85.5 [83.2–87.5]</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>cN+ (SLNB) (N = 699)</th>
<th>ypN0 (N = 215)</th>
<th>ypN+ (N = 484)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>96.3 [92.7–98.1]</td>
<td>89.1 [85.9–91.6]</td>
<td>0.003</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>cN+ (biopsy) (N = 11,851)</th>
<th>ypN0 (N = 4,335)</th>
<th>ypN+ (N = 7,516)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>89.7 [88.7–90.7]</td>
<td>76.9 [75.9–77.9]</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: In this study, residual nodal disease after NAC had a statistically significant negative effect on OS in both cN0 and cN+ breast cancer.

No conflict of interest.

POSTER SESSION 16 November 2022
Local Regional Treatment - Surgery

38 (PB-038) Poster
Breast cancer axillary dissection a “lost procedure, sometimes still necessary...” how to prevent the loss of a surgical technique using cadaver body and Simlifile
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Background: Sentinel lymphonodal biopsy (SLB) is nowadays regarded as a standard procedure in breast cancer surgical treatment. Moreover some authors are investigating the option to omit SLB in tumor less than two cm. On the other hand axillary dissection has become a “rare” indication for breast cancer surgery, thus decreasing surgeon performance and the possibility of learning this procedure among young surgeons. To utilize cadaver body for learning is a valuable tool for surgery competence acquisition. Sim- life is a patented device helping cadaver body utilization for learning process.

Material and methods: We analyze the ideal steps to learn axillary dissection, for young breast cancer surgeon throughout an individual experience of a trainee. The doctor attended the fourth year specialization school in Gynecology, with a dedicated time (8 months) at the breast cancer treatment at the University of Turin (Breast cancer Unit around 1000 cases per yr). The learning process developed throughout five steps for eight months duration: the first at the master of senology helping teacher in preparing anatomical lesson. The second as assistant in 20 surgical breast cancer procedures. The third as first operator in 20 breast cancer surgical procedures including SLB and starting with treating the axilla (axillary dissection) in a gradual manner. The fourth phase included a cadaver-lab course at University center of Poitier together with the senior tutor for two
Background: Preliminary Results of a Prospective Analysis

Mesh-Pocket Supported Prepectoral Direct-to-Implant Breast Reconstruction in breast cancer patients: A Systematic reviews and Meta-Analysis

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Background: We performed a comprehensive systematic review of the literature and a meta-analysis of the oncologic outcome of immediate breast reconstruction (IBR) after mastectomy and mastectomy only. The aim of this study was to analyse the impact of IBR on the prognosis of patients with breast cancer.

Material and Methods: A systematic search of MEDLINE and EMBASE was performed using the key words of breast cancer, mastectomy, IBR. Inclusion criteria was studies reporting survival data after mastectomy only and mastectomy with IBR.

Event-free survival (EFS), Breast cancer specific survival (BCSS) and overall survival (OS) were considered markers of oncologic outcome. The impact of IBR on survival was measured by the effect size of hazard ratio (HR). Data from each study were analysed using Review Manager.

Results: Sixteen studies with 22833 cases of IBR and 60266 cases of mastectomy were included this study. The pooled HR for EFS was 0.83 (95% confidence interval [CI]: 0.63–1.09, p = 0.18). Patients who underwent IBR after mastectomy had similar EFS. Furthermore, patients receiving IBR had better BCSS (HR = 0.68; 95% CI: 0.61 to 0.76, p < 0.001) and OS (HR = 0.68; 95% CI: 0.57 to 0.80, p < 0.001) as those of mastectomy only patients.

Conclusion: There data provided that IBR after mastectomy has a similar oncologic outcome to mastectomy and mastectomy only. Our meta-analysis suggested IBR is a feasible and safe treatment option for patients with breast cancer.

No conflict of interest.
NCT01885572, DRKS0005342; PRO-Pocket-Trial (2017–2020) clinical trials.gov: NCT0398814, DRKS00016673) were performed in eight and 12 clinical centres, respectively, in Germany and Austria to obtain data regarding patient reported and cosmetic outcome as well as complications. Rates of involved margins were analysed.

Results: In the PRO-Bra trial with subpectoral implant placement; the R1-rate of 362 breasts (269 patients) was 12.4% (n = 45). In the PRO-Pocket trial with pre-pectoral implant placement, the R1-rate in 436 breasts (311 patients) was 3.9% (n = 16).

Discussion: Although the rate of involved margins is remarkably decreased over time with anatomically guided gland resection; the burden of revision surgery remains high and new techniques for margin assessment have to be implemented also in patients with subcutaneous mastectomies. First of all intraoperative resection guidance with ultrahigh frequent sonography (high frequency transducer, 18–22 MHz; Apio (700 prism, Canon, Japan) and intraoperative margin MRI-assessment (ClearCoast, Clear Cut Medical, Tel Aviv, Israel) will be implemented — we will report the technique and early results.

Conflict of interest:
Advisory Board:
Stefan Papeke: member of advisory board pfm medical AG
Ralf Ohlinger: member of advisory board: pfm medical AG
Marc Thal: member of advisory board: Amgen, AstraZeneca, Aukermade, Becton-Dickinson, Biom Up, Celgene, ClearCut, Clovis, Daiichi Sankyo, Eisai, Exact Sciences, Gilead Science, Lilly, MSD, Norgine, Neodynamics, Novartis, Onkowissen, Pfizer, pfm Medical, Pierre-Fabre, Roche, RTI Surgical, Seagen, Sysmex
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Corporate-sponsored Research:
Andree Fardig: Honoria for workshops by pfm medical AG, Cologne und DZIG, Berlin
Christine Ankel: received honoria for lecture and/or consulting as well as travel reimbursements from pfm medical
Christine Mau: honoria for presentations from Lilly, Roche, MVZ Munchen, Pfizer

Conflict of interest:
Ownership:
Marion Kiechle: shareholder Therawis
Advisory Board: Stefan Papeke: board member pfm medical AG

43 (PB-043) Poster
Use of Arista™ AH Absorbable Hemostat in breast surgery – analysis of seroma volumes and duration of drainage
E. Klein1, V. Beckert1, G.P. Schmidt1, M. Kiechle1, S. Papeke1. 1Klinikum rechts der Isar, Technical University of Munich, Department of gynecology and obstetrics, Munich, Germany

Background: Novel hemostatic agents such as Arista™ AH have been widely adopted in surgical procedures as the application is easy and direct to the bleeding site. Microporous polysaccharide hemostat agents are a powder hemostat made from purified plant starch.

Material and Method: In our monocentric retrospective evaluation we analysed the application of Arista™ AH (1–5 g) in 114 patients (pts.) receiving breast surgery. The evaluation period was from 10/20 until 10/21.

The groups were analysed using the t-test for independent samples and Levene’s Test of equality of variances.

Results: Mean age was 63 years. 35 patients received Arista™ AH and 59 did not receive the powder hemostat. The exclusion criteria of operation, results are as follows: 79 breast conserving surgeries (BCS) with 32 patients with Arista™ AH and 47 patients without. 35 modified radical mastectomies (MRM) with 23 with Arista™ AH vs. 12 without.

Seroma/Drainage volumes and drainage duration was analysed for the total cohort and separately for the type of operation.
In BCS drainage volumes were significantly lower in the Arista™ AH group than in the non-hemostat group (median 132 ml vs. median 226 ml, p = 0.037, 95% CI: –182.02, –5.85). Also drainage duration was shorter in the BCS Arista™ AH group than in the non hemostat group (median 23.1 days vs. median 3.4 days; p = 0.001, 95% CI: −1.7, −0.48).

In the MRM drainage volumes were significantly lower in the Arista™ AH group than in the non hemostat group (median 239 ml vs. median 485 ml; p = 0.002, 95% CI: –394.57, –95.9). When analysing the drainage duration in the MRM statistical significance was not reached (median 3.3 days vs. median 4.2 days; p = 0.056, 95% CI: −2.25, 0.03).

Conclusion: Using MPH hemostatic powder for post-procedural hemo-stasis in breast surgery showed a significant reduction of seroma volumes and shorter drainage duration.

Conflict of interest:
Ownership:
Marion Kiechle is shareholder of Therawis

44 (PB-044) Poster
A multicenter cohort of breast cancer patients with long-term 125I targeted auxiliary dissection
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Background: Targeted auxiliary dissection (TAD) is increasingly used for auxiliary staging in breast cancer. In TAD, the metastatic lymph node is marked before neoadjuvant chemotherapy (NACT). In case of axillary PCR (pathological complete response) in the marked lymph node (MLN) and sentinel node, auxiliary dissection can safely be omitted as this will not benefit the patient. Several marking methods for TAD exist, most using re-marking before surgery, Feasibility, learning curve, and identification rate (IR) varies. Marking with 125I seed before NACT makes re-marking at surgery redundant, possibly increasing feasibility and IR. We evaluate TAD with 125I seed in a Danish multicenter cohort.

Methods: Patients staged with 125I TAD in Denmark between 1.1.2016–31.08.2021 were included. Patients were identified in radioactivity-emitting implant registries at the Departments of Radiology and from the Danish Breast Cancer Group database. Data were extracted from patients’ medical records and stored in a REDCap database. Exclusion criteria was a history of ipsilateral invasive disease or auxiliary surgery, less than four cycles of NACT or no attempt at TAD. Histocytological confirmation of lymph node involvement before NACT was mandatory. Information on age, treatment year, histological diagnosis, receptor status, number and size of suspicious auxiliary lymph nodes, time interval between marking and surgery, 125I seed batch and activity, neoadjuvant regimen, success rate of surgical removal of
and complications associated with removal, number of SNs removed and whether the SN in SNs was registered. Histopathological status of MLN and SN and whether ALND was performed was registered as well. Data was analyzed with R statistical software. Primary outcome was identification of surrounding tissue, as deemed appropriate by the attending breast surgeon. This resulted in an IR of 99.3%. Minor challenges in marking and removal of the MLN were noted in only three patients. In 66.2% of the patients, the MLN was also a sentinel node. Overall, 43.0% had axillary pCR.

Conclusion: TAD with 125I seed marking before NACT is an easy and feasible procedure without re-marking at surgery, resulting in a high IR with few difficulties at surgery, and might outperform other marking methods. Staging with TAD can spare nearly half of breast cancer patients an axillary dissection after NACT.

No conflict of interest.

45 (PB-045) Poster
MINIVAB trial: Minimally invasive breast cancer excision using vacuum assisted biopsy under ultrasound guidance

W. Sanderink1, R. Mann1,2, MINIVAB study team. 1Radboud University Medical Center, Medical Imaging, Nijmegen, Netherlands; 2Netherlands Cancer Institute, Radiology, Amsterdam, Netherlands

Background: In this abstract we present the design of the MINIVAB trial, which aims to assess whether it is feasible to remove small breast cancers completely using vacuum assisted biopsy (VAB) under ultrasound (US) guidance.

Material and Methods: Women with non-lobular invasive carcinomas ≤15 mm in diameter based upon US and MRI measurements, and without mammographic or MRI evidence of more extensive disease (e.g. microcalcifications, extensive architectural distortion, or non-mass enhancement) will be asked to participate. The tumor will be removed under local anesthesia using the VAB system (also called a vacuum assisted excision, VAE), with US guidance, through a small skin incision (<0.5 cm). A localization marker will be placed in the biopsy cavity, to help determine the cavity location. After 3 weeks, breast conserving surgery is performed, excising the VAE cavity and a ≥1 cm of surrounding tissue, as deemed appropriate by the attending breast surgeon. A sentinel node biopsy will be performed in the same surgical procedure.

Results: MINIVAB is a European multi-center, translational clinical phase II study. Centers within the Netherlands, Spain and Sweden are planned to participate. In total 170 women will be included. The main endpoint of this study is the incidence of successful complete or focally involved tumor excision by VAE based on the surgical specimen. Secondary endpoints are patient, tumor, and histopathological related predictive factors for complete resection, sentinel node status, quality of life, complications and pain experience score.

Conclusion: Our study tests the feasibility of an innovating approach to remove small breast cancer, with a thorough evaluation of adverse events or possible complications. Study outcomes may pave the way to minimally invasive treatment in an outpatient setting for a selection of women with small invasive breast cancers.

No conflict of interest.

46 (PB-046) Poster
Impact of axillary disease extent on baseline 18F-FDG PET/CT in clinically node-negative breast cancer patients on the accuracy of axillary surgical staging after NCT

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1Erasmus Medical Centre, Surgery, Rotterdam, Netherlands; 2Radboud University Medical Center, Medical Imaging, Nijmegen, Netherlands; 3Netherlands Cancer Institute, Radiology, Amsterdam, Netherlands; 4Maastricht University Medical Centre+, Epidemiology, Maastricht, Netherlands; 5University Medical Centre Utrecht, Pathology, Utrecht, Netherlands; 6Maastricht University Medical Centre+, Radiology and Nuclear Medicine, Maastricht, Netherlands; 7Amphia Hospital Breda, Surgery, Breda, Netherlands; 8Erasmus Medical Centre, Surgery, Rotterdam, Netherlands

Background: Clinically node-negative (cN0) breast cancer patients increasingly undergo axillary surgical staging after neoadjuvant chemo( targeted) therapy (NCT). The RISAS-procedure combines the sentinel lymph node biopsy (SLNB) with the excision of axillary lymph nodes pre-NCT marked with a radioactive iodine seed (MARI) after NCT. The impact of axillary disease extent on 18F-FDG PET/CT prior to the false negative rate (FNR) and negative predictive value (NPV) of the RISAS-procedure is investigated.

Methods: After NCT, pathologically confirmed cN0+ patients underwent axillary surgical staging with the RISAS-procedure (i.e. combined SLNB and MARI) followed by a completion axillary lymph node dissection. The FNR and NPV of the SLNB, MARI-procedure and RISAS-procedure were compared between patients with limited and advanced axillary disease (≤3 vs ≥4 suspicious axillary lymph nodes) on baseline 18F-FDG PET/CT prior to NCT.

Results: Axillary pathologic complete response occurred in 55/185 patients. Prior to NCT, 116 patients had limited and 69 advanced baseline axillary disease. The FNR of the SLNB procedure (1.3% vs 7.8%, P = 0.077), MARI-procedure (6.8% vs 9.8%, P = 0.739), and SLNB (16.4% vs 27.0%, P = 0.213) is lower, and the NPV of the RISAS-procedure (97.4% vs 81.8%, P = 0.056), MARI-procedure (87.5% vs 77.3%, P = 0.307), and SLNB (73.3% vs 63.0%, P = 0.431) higher, in limited baseline axillary disease compared to advanced baseline axillary disease.

Conclusion: Stratification of baseline axillary disease extent on 18F-FDG PET/CT insignificantly influences the accuracy of the RISAS-procedure in cN0+ patients after NCT.

No conflict of interest.

47 (PB-047) Poster
Analysis of factors with impact on duration of hospitalisation for patients operated for breast cancer during COVID 19 pandemic

Z. Maksimovic1, A. Curic2, R. Ljubisavljevic1, I. Zarevi1, I. Simovic1, M. Masic3, S. Mitrovi3, Z. Mihajlovic1, S. Bursac4, J. Vukasinovic1, D. Kosic1, E. Maljevac1, D. Bihorac5, S. Vatrichev6, Z. Babic1, N. Rosic5, A. Azanja1, D. Aleksandrovic1, J. Tanasijevic1, N. Kostic1. 1Health center Studenica Kraljevo, Surgery, Kraljevo, Serbia; 2Health center Studenica Kraljevo, Radiology, Kraljevo, Serbia; 3Diagnostic center Eho Mc, Radiology, Novi Pazar, Serbia; 4Health center Studenica Kraljevo, Pathology, Kraljevo, Serbia; 5Polyclinic Matema Gynecology, Cacak, Serbia; 6Health center Studenica Kraljevo, Oncology, Kraljevo, Serbia

Background: Short-stay hospitalization of the patient in units for breast cancer surgery is recognized as a measure of quality of organization and work, certainly without compromising the quality of treatment. The aim of this paper is to point out the factors that influenced the duration of hospitalization during the Covid 19 pandemic and to show the results in the surgical treatment of breast cancer during the Covid 19 pandemic achieved in an general hospital.

Materials and Methods: We analyzed duration of hospitalization in days for 102 patients operated due to breast cancer in the General hospital Studenica Kraljevo, from 15.03.2020.to 20.06.2021. For that purpose it was determined the influence of: the extent of surgery on the breast-conserving or mastectomy, the extent of surgery on the axilla-SLNB or ALND, distance of the patient’s place of residence (urban or rural area, distant places more than 50 km), age, comorbidity, previous neoadjuvant approach. The source of data were medical history cases and discharge lists.

Results: Among 102 operated patients69% had mastectomy,31% had sparing surgery, negative SLN had 38%. ALND had 53%,43% were from rural areas,7% were younger than 40,6% were 81 or older and 87% were 41–80 years old. Significant comorbidities had 9% and after neoadjuvant Th were 11%. Reoperation was done in 7%. One day of hospital stay, discharge on the same day after surgery, had 16%,75% of them had sparing surgery,25% mastectomy.50% SLNB with negative findings and 25% had ALND. The place of residence was very distant for 31% of these patients.20% of them had a pronounced comorbidity. There were 25% under 40 years and 20% those older than 80 years. Neoadjuvant therapy was previously performed in 20%. Two days of hospital stay, discharge the day after the operation, had 65%,while 30% of them had sparing surgery, mastectomy 70%,SLN with negative findings had 36%, ALND had 61%, distant with place of residence were 52%,younger than 40 years were 5% and 3% were older than 80. Comorbidity existed in 9% and neoadjuvant therapy was administered in 12%. Data were analyzed and a statistically significant difference was found that short hospitalizations of only 1 day were more common in smaller operations, less distance from the place of residence, the youngest and oldest patients. There were no complications related to the condition of the operative wound that would be the reason for repeated hospitalization, but in 7 patients (7%) reoperation occurred after a documented PH indicating that finding of positive margins or mastectomy in SLN.

Conclusions: Well-organized breast cancer units under extraordinary situations such as the covid 19 pandemic maintain a high level of quality as measured by length of hospitalization, with impact of the decisive factors
such as extent of breast and regional lymph node surgery, distance of place of residence, age and comorbidity.

No conflict of interest.

**48 (PB-048) Poster**

Sentinel node mapping in patients with biopsy-proven metastatic axillary lymph nodes and upfront surgery: preliminary results of the Multimodal Targeted Axillary Surgery (MUTAS) trial

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Background: Some studies have suggested that the patients included in the Z0011 trial may have represented only patients with ultrasound-negative axillary nodes and axillary invasion diagnosed by sentinel node biopsy. Nevertheless, the NCCN guidelines recommend sentinel node mapping if 1 or 2 suspicious lymph nodes are identified on axillary ultrasound. The aim of this preliminary phase of the MUTAS trial was therefore to establish the accuracy of sentinel node mapping in patients with axillary involvement undergoing upfront surgery.

Material and methods: We recruited patients with proven metastatic axillary nodes and upfront surgery. We performed sentinel node mapping in these patients before the surgical intervention. During the intervention, the biopsy-proven metastatic node, sentinel nodes and the remaining axillary nodes were excised and identified separately. Sentinel node status was considered representative of the status of the remaining axillary nodes. We calculated the sensitivity, specificity, negative predictive value and positive predictive value of the sentinel node, overall and in patients with palpable nodes, those with non-palpable nodes and an ultrasound diagnosis of axillary involvement, in those with 1 or 2 suspicious nodes on axillary ultrasound, and in patients with a single suspicious node on axillary ultrasound.

Results: We included 25 patients in this preliminary phase. The false-negative rate of sentinel node mapping was 28% overall, 21.42% for patients with palpable nodes, 36.36% for patients with non-palpable nodes and an ultrasound diagnosis of axillary involvement, 28.75% for those with 1 or 2 suspicious nodes on axillary ultrasound, and 15.38% in patients with a single suspicious node on axillary ultrasound. Negative predictive value was highest in patients with a single suspicious node on axillary ultrasound (75%).

Conclusion: In this study, sentinel node mapping was not reliable in patients with biopsy-proven metastatic axillary nodes and upfront surgery, either overall or for any of the subgroups studied, as the false negative rate was above 10%. Consequently, it is doubtful that the sentinel node adds any valid information in patients with 1 or 2 suspicious axillary lymph nodes on ultrasound, even if lymph nodes are non-palpable. NCCN recommendations regarding these patients seem inadequate from our point of view.

This study was funded by the 8th Ana Bàllir Grant of the GEICAM (Spanish acronym for the Grupo Español de Investigación en Cáncer de Mama [Spanish Breast Cancer Group]).

No conflict of interest.

**50 (PB-050) Poster**

Alternative breast cancer localisation techniques in Wales: an early experience

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Background: Accurate peri-operative localisation of breast tumours is an important component of breast conserving surgery. While radiologically inserted hook-wires have been the cornerstone of breast localisation for many years, newer techniques are now available. Some of these techniques have several advantages over traditional wire-guided procedures, including greater flexibility in terms of when the localisation procedure can be performed prior to the patients’ operation, avoiding the need for radiology support on the day of surgery. Our unit have recently adopted the use of the Hologic® LOCalizer™ as our localisation technique of choice and we present our initial data and experience of the technique here.

Materials and methods: Data from all patients who underwent a localised wide local excision using the Hologic® LOCalizer™ device was collected over the initial 6 months immediately after obtaining the equipment. Data collected included: patient demographics, BMI, indication for surgery, pre-operative radiological findings, tumour characteristics, pathological margins and post-operative complications.

Results: A total of 54 patients underwent surgery using the Hologic® LOCalizer™ during the study time-frame (January–June 2021). The median patient age was 62 years (37–73 years), mean BMI was 30.1Kg/m² (21–41Kg/m²) and the majority of patients had lesions detected through breast screening (n = 33, 61%). Most patients were undergoing surgery for an invasive breast cancer (n = 44, 81%) and the mean tumour size detected via mammogram and ultrasound was 16.5 mm (4–62 mm) and 11.6 mm (4–58 mm) respectively. The RFID was inserted an average of 12 days prior to the patients surgery (0–44 days) and cirumferential excision margins were complete (>1 mm) in 86% (n = 57) of cases. Complications following surgery occurred in 5 patients (7%), primarily due to post-operative wound infection (n = 3, 4%). In 2 cases, the RFID Tag was dislodged during the surgical procedure, although successful surgical excision of the lesion was still possible. In both cases the TAG was placed superficially within the breast and was also placed on the same day as the patients surgery.

Conclusions: The Hologic® LOCalizer™ appears to be a safe and clinically valid alternative to wire-guided localisation of impalpable breast lesions. Despite the ‘learning curve’ phenomenon associated with the use of any new technique, post-operative results appear satisfactory in terms of an acceptable complication and re-excision rate, despite the patient population being of higher than average BMI. Caution should however be taken when using the technique to localise lesions deep within the breast of patients with a higher than average BMI and the authors would also recommend avoiding RFID TAG placement on the day of surgery itself, to minimise the risk of TAG displacement during the surgical procedure.

No conflict of interest.
Surgical outcomes after neoadjuvant systemic therapy in patients with lobular carcinoma

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Background: Breast cancer patients with invasive lobular carcinoma (ILC) have an increased risk of positive margins and show limited response to neoadjuvant systemic therapy (NST). Although magnetic resonance imaging (MRI) can be used as an accurate tool to assess response to NST, residual disease can be underestimated due to its diffuse growth pattern, resulting in tumor-positive margins. Re-excision as a result of tumor-positive margins may delay administration of adjuvant treatment and may have a negative effect on cosmetic outcome. Therefore, we aimed to investigate surgical outcomes in patients with ILC treated with NST.

Methods: We selected all breast cancer patients with ILC treated with NST who underwent surgery at the Netherlands Cancer Institute from 2010 to 2019. Patients with mixed type ILC in pre-NST core biopsies were excluded if the lobular component was not confirmed in the surgical specimen. Main outcome parameters were tumor-positive margins and re-excision rate. Associations between baseline characteristics and tumor-positive margins were assessed, as was locoregional recurrence rate (LRR), recurrence free survival (RFS) and overall survival (OS).

Results: We included 191 patients. After NST, 107 (56%) patients had breast conserving surgery (BCS) and 84 (44%) patients underwent mastectomy. In total, 67 (35%) patients had tumor-positive margins: 55 (51%) in the BCS and 12 (14%) in the mastectomy group (p-value <0.001). Re-excision was performed in 35 (33%) patients with BCS and in 4 (5%) patients with mastectomy (Table 1). BCS was preserved in 77% (n = 82) of patients that initially underwent BCS and in 33% (n = 29) a mastectomy was deemed necessary. Tumor-positive margins were associated with cT3 status (OR 4.62, 95% CI 1.26–16.98, p-value 0.021) in the BCS group. Five-year RFS (4.7%), RFS (80%) and OS (93%) was not affected by type of surgery after NST.

Conclusion: Although positive margins after NST in patients with ILC required re-excision in 33% of patients with BCS, it is considered safe given that five-year RFS remained excellent and LRR and OS did not differ between BCS or mastectomy.

No conflict of interest.

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No conflict of interest.
TAD/SNB: 51% (21/41) vs 46% (53/109) were comparable, but more triple-negative and HER-2 positive cancers were in the TAD/SNB group (81% (25/31) vs 45% (49/109); p = 0.08). Significantly less radically abnormal node was detected after NAT in TAD/SNB (\((c = 3.24\% (1/41) vs 21.4\% (23/109); p = 0.005\).

Conclusions: Radiological response provides reliable guidance for selection for TAD/SNB. TAD/SNB is less invasive in comparison to ANC and carries significantly less morbidity. Magseed localisation of the clipped node did not decrease the removed lymph node number when compared to NAT with no localisation.

No conflict of interest.

54 (PB-054) Poster Superior survival after breast conserving therapy versus mastectomy – a multicenter Asian cohort study of 3655 patients

Background: Recent cohort studies from the West have demonstrated improved survival after breast conserving surgery with radiotherapy (BCS+RT) compared to mastectomy (Mx). However, mastectomy rates remain high amongst Asian women. Therefore, in this retrospective multi-institutional study we aim to review our Asian women with early breast cancer undergoing Mx versus BCS+RT to evaluate if similar survival outcomes are seen.

Material and methods: We identified all female patients with newly diagnosed early breast cancer (stage I or II) in our prospectively collected Joint Breast Cancer Registry database in Singapore from 2002–2016. The cohort was divided into 3 groups: BCS+RT, Mx, and BCS alone. Pattern of disease recurrence, overall (OS) and disease-free survival (DFS) between the three groups were analysed.

Results: 3655 patients were included in the analysis. 1943 (53%) patients underwent BCS+RT, 1596 (44%) Mx and 11% (3%) BCS alone. Median age at diagnosis was 53 years. Median follow up was 9.45 years (IQR: 5.92–20.02). 5-year OS of BCS+RT vs Mx vs BCS cohort was 96.5%, 95% CI 92.0–98.4% vs 92.4, 95% CI 90.0–94.7% compared with BCS+RT vs 75.4, 95% CI 73.6–77.5% (HR 2.43, 95% CI 2.03–2.90, p < 0.001). 5-year DFS of BCS+RT vs Mx vs BCS cohort was 90.3, 95% CI 90.2–90.4% vs 88.1, 95% CI 87.8–88.4% vs 75%, (HR 1.92, 95% CI 1.69–2.18, 95% CI 6.43–7.28, 95% CI 6.43–7.28, p < 0.001).

Conclusions: Similar to their Western counterparts, Asian women with early-stage breast cancer who underwent BCS+RT had superior overall and disease-free survival outcomes compared to those who underwent Mx. This disparity should be taken into consideration when counselling them for breast cancer surgery.

No conflict of interest.

55 (PB-055) Poster Tumour characteristics and radiological response are better predictors than tumour extent of axillary pathological complete response after neoadjuvant systemic therapy

Background: Management of the axilla in breast cancer patients with nodal metastases after pre-operative systemic therapy has been progressing towards de-escalation of surgery. Options include axillary lymph node dissection (ALND) and increasingly targeted axillary dissection (TAD). TAD allows more accurately stage the post-treatment axilla with reduction in morbidity associated with ALND. However not all patients achieve pathological complete response in the axillary lymph nodes (LNPpCR). We aim to identify pre-operative demographics, radiological and clinicopathological factors which are most likely to achieve LNPpCR and benefit from TAD.

Material and methods: 109 cases of breast cancer with axillary nodal metastases treated with neoadjuvant chemotherapy and surgery between 2006 to 2017 in our hospital’s database were retrospectively identified. Demographic, radiological and clinicopathological factors between patients who achieved LNPpCR and those who did not (nLPpCR) were analysed. Variables influencing LNPpCR were further investigated using univariable and multivariable analyses.

Results: Age, race, number of abnormal axillary lymph nodes, radiological size of abnormal lymph nodes, pre-chemotherapy stage, tumour type and focality were not found to be significantly different between the two groups while pre-chemotherapy tumour size, post-chemotherapy radiological response to chemotherapy, grade, estrogen receptor (ER), progestrone receptor (PR) and Her2 status, and presence of lymphovascular invasion (LVI) were significantly different.

Univariable analysis showed statistical significance for post-chemotherapy complete radiological response of tumour (p = 0.0054), post-chemotherapy complete radiological response of axillary lymph nodes (p = 0.0019), post-chemotherapy overall (tumour and axillary lymph nodes) complete radiological response (p = 0.0020), grade 3 (p = 0.0022), PR negativity (p = 0.0005), HER2 positivity (p = 0.0006), and LVI negativity (p = 0.0010). Multivariate analysis but not multifocality was found to be significant (p = 0.043 vs p = 0.429).

Multivariable analysis demonstrated statistical significance for grade (p = 0.0395, OR = 2.605 [95% CI: 1.047 to 6.482]), HER2 status (p = 0.0008, OR = 4.82 [95% CI: 1.921 to 12.095]) and LVI (p = 0.0059, OR = 0.219 [95% CI: 0.074 to 0.646]).

Conclusion: Receptor status and post-chemotherapy radiological response are better predictors of LNPpCR than tumour size or size and number of radiologically abnormal axillary lymph nodes. Patients who demonstrate complete radiological response, have ER negative, PR negative and, in particular, HER2 positive and grade 3 tumours are more likely to achieve lymph node pCR and should be given greater consideration for targeted axillary dissection after neoadjuvant systemic therapy.

No conflict of interest.

56 (PB-056) Poster Predictive factors of macrometastasis in sentinel lymph node in invasive lobular carcinoma

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Background: The axillary impact of invasive ductal carcinoma (IDC) has been extensively studied. But, invasive lobular carcinoma’s (ILC) local recurrence, its tumor biology and its poor axillary disease translation in imaging tests, results in a greater lack of knowledge about its influence at the axillary level. The aim of this study is to evaluate whether the axillary involvement of ILC in patients with cN0 is similar to the IDC described in the AMAROS trial, and analyze the risk factors (RF) associated with macrometastasis in sentinel lymph node (SLN).

Abstracts, EBCC-13 Poster Session
**Material and methods:** An observational, retrospective and bicentric study of patients diagnosed of CT1-T3 ILC between 2007–2020 who underwent to primary surgery and SNL biopsy (SLNB).

<table>
<thead>
<tr>
<th>Table 1: Univariate Analysis</th>
<th>pN0 (n = 166)</th>
<th>pN+ (n = 59)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± SD</td>
<td>58 ± 10</td>
<td>54 ± 9</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menopausal status, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menopause</td>
<td>124 (77%)</td>
<td>36 (23%)</td>
<td>0.03</td>
</tr>
<tr>
<td>Premenopause</td>
<td>42 (65%)</td>
<td>23 (35%)</td>
<td></td>
</tr>
<tr>
<td>cT, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>102 (85%)</td>
<td>18 (15%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>T2</td>
<td>51 (99%)</td>
<td>35 (41%)</td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td>10 (62%)</td>
<td>6 (38%)</td>
<td></td>
</tr>
<tr>
<td>Mammmography size (mm), mean ± SD</td>
<td>18.1 ± 13.7</td>
<td>24.3 ± 17.0</td>
<td>0.02</td>
</tr>
<tr>
<td>MRI (mm), mean ± SD</td>
<td>22.6 ± 13.2</td>
<td>30.5 ± 19.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Lymphovascular invasion, n (%)</td>
<td>Yes</td>
<td>8 (47%)</td>
<td>9 (53%)</td>
</tr>
<tr>
<td>No</td>
<td>143 (75%)</td>
<td>48 (25%)</td>
<td></td>
</tr>
<tr>
<td>Histological subtype, n (%)</td>
<td>Pleomorphic</td>
<td>235 (6%)</td>
<td>18 (44%)</td>
</tr>
<tr>
<td>Classic</td>
<td>130 (76%)</td>
<td>40 (24%)</td>
<td></td>
</tr>
<tr>
<td>Signet-ring cells</td>
<td>4 (100%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Type of surgery, n (%)</td>
<td>Conservative</td>
<td>126 (77%)</td>
<td>37 (23%)</td>
</tr>
<tr>
<td>Mastectomy</td>
<td>40 (65%)</td>
<td>22 (35%)</td>
<td></td>
</tr>
</tbody>
</table>

We compared our results with those published in AMAROS trial in the axillary lymph node dissection (ALND) group, considering that our hospital avoids ALND in patients with macrometastasis in SNLB since 2012. To identify the RF of macrometastasis, patients with micrometastasis and isolated tumor cells (ITC) were grouped with negative SLN. A uni- and multivariate analyses (logistic regression) of the most relevant diagnostic variables were performed.

**Results:** 225 patients were evaluated. 59 had macrometastasis, 41 micrometastasis, 13 ITC and 112 negative SLN. ALND was performed in 37/59 (63%) of macrometastasis. In our serie, a 19% (7/37) of ALND had > 4 additional positive lymph node compared with the 8% (52/672) described in the AMAROS trial (p = 0.02), in a sample of 80% of IDC.

The RF associated with the presence of macrometastasis in SLN in the univariate analysis are described in Table 1. In the multivariate analysis remains as RF: age (OR 0.94 IC95% 0.9–0.98), T (T2 OR 2.49; 95%CI 1.0–6.0), tumor’s size by MRI (OR 1.0; 95%CI 1.0–1.1) and histological subtype (pleomorphic OR 2.8; 95%CI 1.1–7.2).

**Conclusions:**
- The axillary involvement of ILC may be distinct from the IDC which suggests that the management of these tumors could be different.
- In our population of ILC, the predictive factors of macrometastasis in SLN are the younger age, the pleomorphic subtype, bigger tumor’s size by MRI and the stage T2.

No conflict of interest.

**Poster**

**Role of perioperative tranexamic acid in reducing drain volume in breast cancer patients undergoing axillary lymph node dissection: A randomized controlled trial**


**Background:** Axillary lymph node dissection (ALND) is the standard of care in the management of the axilla in node-positive breast cancer patients. ALND leads to persistent drainage from the axilla, seroma formation, and lymphedema. The two critical factors linked to seroma production are the formation of inflammatory exudate during the healing process after surgery and leakage from the lymphatics that were cut during the removal of nodes but were not sealed. Low fibrinogen levels and high fibrinolytic activity in the fluid exudate after dissection have increased seroma formation. Tranexamic acid (TA), an antifibrinolytic, has been tried in a few trials to reduce axillary drainage and seroma formation.

**Materials and methods:** It was designed as an open double-arm randomized controlled trial. A total of 40 patients who underwent ALND were randomized into control and intervention groups. All patients in the intervention arm received a single intravenous dose of TA (15 mg/kg) at induction and oral TA 500 mg twice daily for two days postoperatively. After discharge, patients were assessed for daily drain output and seroma formation after drain removal till day ninety of surgery. Patient and surgical variables were analyzed.

**Results:** The patient’s age, tumor size, distribution of higher BMI patients (>25), stage at presentation, neoadjuvant chemotherapy status, and the total number of lymph nodes harvested were similar in the study and treatment groups. The administration of tranexamic acid reduced the mean cumulative drain output in the intervention group, although not statistically significant (p = 0.1). The incidence of seroma formation was also decreased in the intervention group (40%, n = 8 vs. 20%, n = 4, p = 0.3), which was not significant. The mean duration of the drain was also similar between the two groups. There were no significant side effects with the administration of the drug.

**Conclusion:** Tranexamic acid, when used perioperatively, did not result in a statistically significant reduction in drain output and mean duration of drainage. Although the incidence of seroma formation was reduced, this was not statistically significant. Further studies with a higher dose and duration of the drug are required to determine tranexamic acid’s effect on drain output reduction.

No conflict of interest.
**Background:** Sentinel lymph node biopsy (SLNB) using radio-pharmaceutical and a blue dye is gold standard for axillary staging in clinically node-negative breast cancer. Treatment N = 36

<table>
<thead>
<tr>
<th>Age (years) N = 36 (1 bilateral)</th>
<th>80–84</th>
<th>24 (66.7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>85–91</td>
<td>12 (33.3)</td>
<td></td>
</tr>
</tbody>
</table>

**Tumor characteristics**

<table>
<thead>
<tr>
<th>Median number of sentinel lymph nodes (SLN)</th>
<th>83.5 (0.49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor size (mm) N = 37 ≤20</td>
<td>29 (78.4)</td>
</tr>
<tr>
<td>&lt;20 ≤ 50</td>
<td>8 (21.6)</td>
</tr>
</tbody>
</table>

**Histological type N = 37 IDC**

<table>
<thead>
<tr>
<th>Treatment N = 36</th>
<th>Adjuvant Hormonotherapy</th>
<th>Adjutant Radiotherapy</th>
<th>Neoadjuvant Hormonotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>91.7</td>
<td>11 (30.6)</td>
<td>9 (25)</td>
</tr>
</tbody>
</table>

**Background:** Sentinel lymph node biopsy (SLNB) using radio-pharmaceutical and a blue dye is gold standard for axillary staging in clinically node-negative early breast cancer and increasingly being used for post NACT cN0 axilla as well. High costs and limited availability of radio-pharmaceutical and/or gamma probe are major deterrents in performing SLNB in developing countries. In this study, we evaluated feasibility of SLN identification (SLN-IR) of fluorescein-guided (FG) SLNB in combination with methylene blue dye (MBD).

**Methods:** This was a prospective cross-sectional non-randomized validation study in patients with post NACT clinically node-negative axilla. Patients underwent validation SLNB using fluorescein (and blue LED light) and MBD. Axillary dissection was performed irrespective of SLNB histology. SLN-IR and False Negative Rate (FNR) were assessed.

**Results:** The SLNs were identified in 51 out of 56 (91%) post Neoadjuvant Chemotherapy (NACT) patients. The median number of sentinel lymph nodes identified 1 (range 1–3) in post NACT patients. The SLN-IR using MBD was 91%, FD was 85%; and combined MBD FD was 89%. The false negative rate (FNR) was 7.8% (MBD), 8.3% (FD) and 7.8% (MBD+FD)

**Conclusions:** This prospective validation study showed adequate SLN-IR and FNR using low cost dual dyes in post NACT cN0 patients and can be used in low resource settings.

No conflict of interest.

**Evaluation of patient reported outcome measure following periareolar (Benelli) mammoplasty using BREAST-Q: Single centre 5-year experience**

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**Background:** Periareolar (Benelli) Mammoplasty is a round block oncoplastic volume displacement technique confining the scar to the areola. The advent of oncoplastic techniques has increased the number of breast conserving surgeries, thereby requiring further assurance of an appropriate balance between oncological safety with acceptable aesthetic outcome. BREAST-Q is a validated, highly reliable patient reported outcome measure and has recently been developed for breast-conserving therapy (BCT).

This aim of the study was to assess patient satisfaction with their health and health-related quality of life following breast conserving surgery (BCS) using BREAST-Q.

**Methods:** This retrospective study collected BREAST-Q questionnaires from breast cancer patients undergoing Periareolar (Benelli) Mammoplasty between 1 January 2015 and 31 December 2019. Patients were contacted by phone, invited to participate and BREAST-Q questionnaire sent by post.

The BREAST-Q was given post-operatively to measure patient outcome measures using quality of life domains – psychosocial well-being, sexual well-being, physical well-being and satisfaction domains - Rasch Transformed Score was calculated for each domain.

**Results:** There were 134 patients operated in the study period. The median age was 78 (range 35–91 years). Forty-six questionnaires were returned (34%). The results are summarised in the table next to normative scores in the literature of women who have not undergone breast cancer surgery.

The highest score was for psycho-social well-being and satisfaction with breasts compared to a normal population. Physical well-being scored highly but was slightly lower than the general population and may reflect the effects of ongoing adjuvant treatment, although the adverse effects of radiotherapy were relatively low. Sexual well-being scores were low but not much different from the general population. Patient experience with the information and satisfaction with breast surgeon both scored highly.

**Conclusion:** Benelli mammoplasty scores highly on overall satisfaction, psychosocial and physical well-being, the adverse effects of radiotherapy was minimal, but it does not appear to impact sexual well-being. Patients were highly satisfied with their health care providers Data from this study will inform a larger prospective study into this topic and direct further patient support in low scoring domains.

No conflict of interest.
Background: Postmastectomy radiotherapy (PMRT) is an allegedly associated with a higher risk of complications of combined nipple-sparing or skin-sparing mastectomy and subpectoral direct-to-implant immediate breast reconstruction (INN/SSMDT-IIBR). For this reason, this combination is usually advised against or, even, refused in women who need to undergo PMRT. Because this advice has never been justified, we assessed the short-term complications that may potentially be associated with PMRT after INN/SSMDT-IIBR.

Methods: We compared the complications requiring reintervention and implant loss occurring after 273 INN/SSMDT-IIBR that were exposed to PMRT within the first 16 postoperative weeks (interventional group) to those occurring in 739 similarly operated breasts that were not (control group). Additionally, we compared the fraction of complications requiring reintervention occurring after the onset of radiotherapy in the interventional group to that occurring after a comparable postoperative period in the control group.

Results: The fraction of breasts requiring unscheduled surgical reinterventions for complications and the loss of implants did not differ significantly between both groups but significantly more reinterventions were needed among the controls (p < 0.001). Postmastectomy radiotherapy was administered at a mean of 6.2 weeks following the INN/SSMDT-IIBR. Therefore, short-term complications did not postpone the timing of the radiotherapy. The fraction of events after the onset of radiotherapy in the interventional group was higher than the fraction of events after 6.2 weeks in the control group, but not significantly so.

Conclusion: We found no proof for the alleged increase of short-term complications in patients undergoing combined breast reconstruction techniques. Free flaps offer great cosmetic results and also prevent donor site morbidity but they require advanced microsurgical techniques that may be difficult in institutions with constraints of resources. In these situations, simple and reliable techniques such as the pedicled Vertical Rectus Abdominis Myocutaneous (VRAM) flap and Transverse Rectus abdominis myocutaneous (TRAM) flap as options for post-mastectomy chest wall reconstruction.

No conflict of interest.

62 (PB-062) Poster
A comparative analysis between vertical rectus abdominis myocutaneous (VRAM) flap and transverse rectus abdominis myocutaneous (TRAM) flap as options for post-mastectomy chest wall reconstruction
A. Bhattacharya1, D. Maitra1. Medical College Kolkata, General Surgery, Kolkata, India

Background: Oncoplastic breast reconstruction prevents the chest wall deformities occurring after a mastectomy or occurring after chest irradiation following lumpectomy. It offers lower morbidity, higher quality of life and a more natural aesthetic outcome than traditional breast reconstruction techniques. Free flaps offer great cosmetic results and also prevent donor site morbidity but they require advanced microsurgical techniques that may be difficult in institutions with constraints of resources. In these situations, simple and reliable techniques such as the pedicled Vertical Rectus Abdominis Myocutaneous (VRAM) flap and Transverse Rectus Abdominis Myocutaneous (TRAM) flaps offer a safe and reliable reconstructive option.

Material and methods: 25 patients with tumours in breast (carcinoma/sarcoma) presented to Medical College Hospital, Kolkata from October, 2020 to September, 2021. All of them underwent mastectomy followed by chest wall reconstruction using oncoplastic techniques. On retrospective analysis, it was found out that 13 patients had undergone chest wall reconstruction using the VRAM flap and 12 patients had undergone chest wall reconstruction using the TRAM flap. These patients were divided into two groups. Group A consisted of patients who underwent chest wall reconstruction using the VRAM flap and Group B consisted of patients who underwent chest wall reconstruction using the TRAM flap. Both groups were compared with respect to initiation of adjuvant therapy, post-operative complications and morbidity, rate of recurrence and tissue coverage post-excision.

Results: Initiation of adjuvant therapy was possible in 92.3% of patients in Group A compared to 50% in Group B. Flap necrosis occurred in 7% of patients in Group A while 50% of patients in Group B developed flap necrosis. Donor-site skin necrosis did not occur in any patient of Group A while 33.3% patients in Group B developed donor-site skin necrosis. Umbilical necrosis did not occur in Group A while it occurred in 8% of patients in Group B. No patient in Group A complained of any stiffness or limitation in daily activity following the reconstruction, while 8% of patients in Group B complained of the same. With respect to rate of recurrence and tissue coverage, both the groups had comparable outcome.

Conclusion: Compared to patients who underwent reconstruction using the TRAM flap, earlier initiation of adjuvant therapy was possible in patients who underwent reconstruction using the VRAM flap. Moreover, the patients experienced less post-operative complications and morbidity associated with TRAM flaps were more as compared to VRAM flaps. With respect to the rate of recurrence and tissue coverage post-excision, both the flaps had comparable outcome. Thus, chest wall reconstruction using VRAM flap is superior compared to reconstruction using TRAM flap.

No conflict of interest.

63 (PB-063) Poster
Is sentinel lymph node biopsy without frozen section in early stage breast cancer sufficient in accordance with ACOSOG-Z0011? A retrospective review from King Chulalongkorn Memorial Hospital
N. Teeratanapong1, B. Lerttiendamrong1, M. Vongsaisuwon1, V. Vacharathith1, K. Tantiphatichava1, S. Manasanyakom1, P. Pongwattanakit1, Mawin Vongsaisuwon1. King Chulalongkorn Memorial Hospital, Surgery, Bangkok, Thailand

Background: In 2021, there is an increased global trend for sending sentinel lymph node biopsy (SLNB) specimens for permanent section (PS) without intraoperative frozen sections (FS). ACOSOG Z0011 revealed that re-operation of axillary lymph node dissection (ALND) was not necessary in patients with 1 or 2 nodal metastases. Permanent section alone was thought to be sufficient for sentinel lymph node (SLN) diagnosis. This pilot study conducted in Thailand determines the re-operation rate for SLNB without FS.

Material and Method: We retrospectively reviewed 239 SLNB cases without FS at King Chulalongkorn Memorial Hospital from April 2016 to April 2021. The patients were diagnosed with primary invasive breast cancer with clinically negative nodes. The clinical nodal status was assessed from physical examination radiographic findings on ultrasonography and mammography. The re-operation rate was determined by the number of positive SLNs; where 3 more nodal metastases were subjected to a second surgical procedure.

Result: Between April 2016 and April 2021, 239 patients who had undergone SLNB in accordance with ACOSOG Z0011 criteria with PS alone was enrolled. A total of 975 SLNs were removed from these 239 patients, with an average of 4.15 nodes per patient. Out of 239 patients, 21 (8.8%) and 6 (2.5%) had metastatic disease in 1 and 2 nodes, respectively. The remaining 212 (88.7%) patients had no nodal metastasis. None of the patients were subjected to a second surgical procedure.

Conclusion: We conclude that the implementation of SLNB with PS analysis alone in patients who satisfy the ACOSOG Z0011 criteria, with a re-operation rate of 0%, does not have outcomes that would be altered by the standard of care additional FS analysis. With omission of FS analysis, operation cost, operative time and anesthetic side effects are projected to decrease.

Table 1: Distribution of retrieved sentinel lymph nodes and presence of metastatic disease

<table>
<thead>
<tr>
<th>No. of patient with no nodal metastasis</th>
<th>No. of patient with 1 nodal metastasis</th>
<th>No. of patient with 2 nodal metastases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
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<td>45</td>
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</tr>
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<td>3</td>
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<td>4</td>
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<tr>
<td>6</td>
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<tr>
<td>&gt;6</td>
<td>31</td>
<td>29</td>
</tr>
<tr>
<td>975 (4.15)</td>
<td>239</td>
<td>212</td>
</tr>
</tbody>
</table>

No conflict of interest.

64 (PB-064) Poster
Borderline phyllodes tumors do not require wide resection margin
K. Yoon1. Seoul National University Bundang Hospital, Surgery, Seongnam, South Korea

Background: Phyllodes tumor (PT) is a rare fibroepithelial neoplasm of the breast that can be classified as benign, borderline, or malignant. Conventionally, surgical margins of greater than 1 cm are recommended for all types of PT; however, the optimal extent of margin is still under debate. This study aims to investigate the optimal surgical margin to prevent recurrence after surgery for PT and to evaluate risk factors for local recurrence (LR).

Material and methods: Retrospective analysis of a prospective cohort database was performed. Patients who underwent curative surgery for PT at Seoul National University Bundang Hospital between July 2013 and February 2022 were reviewed. Patients without available medical records were excluded from analysis. Surgical margin was defined as either negative (≥0.1 cm from tumor) or close/involved (<0.1 cm from tumor).

No conflict of interest.

Poster Session Abstracts, EBCC-13
Results: Of the 452 patients included, 311 (68.8%) were benign and 141 (31.2%) were borderline/local recurrence. Local recurrence rates for benign and borderline tumors were 3.5 (11/311) and 7.8 (11/141), respectively. The median follow-up was 27.5 months. For benign tumors, 5-year local recurrence-free survival (RFS) was similar between margin negative and close/involved groups (92.9% vs. 90.9%, P = 0.2). In borderline tumors, there was statistically significant difference in 5-year local RFS according to margin status (negative 93.0% vs. close/involved 73.4%, P = 0.023). In univariate analysis, surgical margin (hazard ratio (HR) 0.385, P = 0.027) and mitotic count (HR 1.945, P = 0.046) were independent risk factors for local recurrence. Further multivariate analysis found only surgical margin (HR 0.341, P = 0.022) to be prognostic.

Conclusions: In benign PT, resection margin is not a prognostic factor for LR as long as the tumor is encapsulated. However, securing a resection margin of more than 0.1 cm is required to reduce LR in borderline PT.

No conflict of interest.

65 (PB-065) Poster Quality of life and patient satisfaction after nipple sparing mastectomy versus skin sparing mastectomy and immediate and one stage versus two stages breast reconstruction

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Background: Nipple Sparing Mastectomy (NSM) and Skin Sparing Mastectomy (SSM) are oncologically safe procedures compared to classical modified radical mastectomy. This study evaluates whether NSM patients are more satisfied and have better quality of life than matched SSM patients and assesses patients’ quality of life after immediate one stage breast reconstruction with prepectoral permanent implants (IBR) compared to a matched group undergoing two stages breast reconstruction with expander and later with permanent implant.

Material and methods: Women who underwent NSM or SSM as IBR or two stages procedure in our breast unit completed a postoperative BREAST-Q survey at least one year after surgery and completing of their treatment and their prospectively collected database was reviewed.

Results: Overall 260 patients were included. 160 had NSM and 100 SSM at least 1 year prior to BREAST-Q survey completion. 100 of the SSM category had IBR with permanent implant, whereas 60 had two stages reconstruction. 55 patients of the SSM category had IBR, whereas 45 had two stages procedure. BREAST-Q Psychosocial and Sexual Well-Being scores were significantly higher in NSM patients compared with SSM patients, but there was no statistically significant difference between the IBR and the two stages reconstruction subgroups. Satisfaction with the breasts was significantly higher in NSM patients compared with SSM patients, but there was no statistically significant difference between the IBR and the two stages reconstruction subgroups. Radiation therapy, BMI >30 and nicotine abuse were independent risk factors for complications and dissatisfaction with the breasts. No patient experienced local recurrence or distant metastasis with a follow up of at least 36 months.

Conclusions: Women who are candidates for NSM should be offered these method either with IBR or with two stages reconstruction, with high rates of patients’ satisfaction. IBR is a highly acceptable method for women requiring mastectomy.

No conflict of interest.

66 (PB-066) Poster Healthcare providers’ perceptions of the surgical treatment for male breast cancer: Time to add surgical options other than mastectomy to the discussion

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Background: The most common surgical treatment offered to male breast cancer (MBC) patients remains mastectomy. One possible explanation is healthcare providers’ perceptions of men’s experience and needs, and their limited knowledge of the surgery’s effect on men. This study explores healthcare providers’ perceptions of the surgical management of MBC, its effects on men, and the extent to which these are considered in medical decision-making.

Methods: Semi-structured interviews were conducted with healthcare providers treating breast cancer. Purposive sampling was directed to identify diverse interviewees. Data collection concluded when data saturation was reached. The thematic analysis method guided data analysis.

Results: Nineteen healthcare providers from five public hospitals participated in this study including surgeons, oncologists, and nurses. Analysis of the interview transcripts suggests that healthcare providers are aware of men’s psychological distress caused by mastectomy, however still fail to offer procedures other than simple mastectomy. This is rationalized by medical considerations that preclude the use of breast conservation surgery in MBC. Findings also reveal that male breasts are perceived as unimportant, hence cosmetic considerations and plastic surgeon consultation are not considered for men undergoing mastectomy.

Conclusions: Findings imply that although healthcare providers are aware of men’s difficulties with mastectomy, these are not considered in the surgical treatment offered to men.

Medical teams should be aware of and address the emotional aspects of mastectomy in MBC. Surgical solutions, such as breast conservation or nipple reconstruction should be discussed when medically possible.

No conflict of interest.

67 (PB-067) Poster Ultrasound measurement of the distance between the breast tumor and the skin: a cut-off value for safe skin preservation. Diagnostic accuracy study

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Background and purpose: In superficial tumors of the breast, it is necessary to plan the thickness of surgical skin flaps, and whether skin can be preserved for esthetics results. Ultrasound scans allow the evaluation of the tumor size and location, and its relationship with adjacent structures such as the skin. However, because the patient is usually lying down with the arms extended behind the head during the exam, the breast may be flattened, and the distance measured by ultrasound may be different than the same measurement on a surgical or pathological specimen. This study aimed to find an ultrasound measured cut-off distance between tumor and skin (TSD) that allows patients to have the skin over the tumor spared.

Methods: This is a diagnostic accuracy study comparing preoperative ultrasound TSD with pathological TSD and the thickness of the skin flaps. We recruited all consecutive women diagnosed with breast cancer between January 2017 and December 2019 whose surgical planning allowed to have the tumor and overlying skin to be removed in bloc (reconstruction procedures, situations where skin removal would not lead to esthetic problems and superficially located tumors). We excluded patients who would not have the tumor removed surgically together with the adjacent anterior skin (either because this would not be needed or for aesthetical reasons), patients with carcinoma in situ and with non-nodular lesions (such as microcalcifications and architectural distortions). Measurements were made: preoperatively (by ultrasound), during surgery (using a metal caliper to obtain the thickness of surgical skin flap) and after surgery (pathological). A pathological tumor-skin distance greater than surgical skin flap thickness would indicate preservation of skin above the tumor.

Results: We evaluated 96 consecutive patients with 102 lesions. The average surgical flap thickness was 5.5 mm (3–10 mm). In 27 (44.3%) patients, the value was greater than 5 mm and in 34 (55.7%), it was lower. The ultrasound-measured cut-off TSD of 2.1 mm obtained 96.0% accuracy in predicting free anterior margin, considering a 5-mm thick surgical flap. The ROC curve has shown that the cut-off point of 2.1 mm in the ultrasound measurement is associated with a sensitivity of 96.7% and specificity of 90.9% of a case with skin preservation possibility. The measurement made by the pathologists (TSD-PAT) was always larger than the ultrasound value (TSD-USG). The average rate between TSD-PAT and TSD-USG was 2.64.

Conclusion: In breast superficial tumors, a cut-off distance of 2.1 mm or more measured preoperatively by ultrasound allows safe preservation of the skin above the tumor. Future studies need to follow up for longer the women submitted to skin preservation surgeries, especially those not undergoing radiotherapy.

No conflict of interest.

Abstracts, EBCC-13 Poster Session
Poster Papillary carcinoma of breast – Clinicopathological characteristics, management, and survival
B. Rehman 1, J. Sarfaraz 2, A. Mumtaz 2, B. Sajjad 2, N. Urooj 1, A.I. Khan 1, Z. Chaudhary 1, A. Pavlitz 1, Shaukat Khanum memorial cancer hospital and research center, Breast and Oncology, Lahore, Pakistan; 2Royal Free NHS London, UK

Objective: To study clinic-pathological features and treatment strategies of papillary carcinoma and to see its prognosis in term of survival.

Material and Methods: Data of 58 patients was reviewed retrospectively from January 2010 to December 2016. Four types of papillary carcinoma (on final resected specimen) were included i.e., Invasive papillary ca (IPC), Invasive (non-mass associated) papillary ca (EPC), solid papillary ca (SPC), papillary DCIS (Ductal carcinoma in situ). Various features in all four types were observed and compared.

Results: Out of total 58 patients, 08 were males (13.7%). The mean age at presentation was 61 years, while the mean tumor size was 2.1 cm. Frequency of each histological type was: IPC (n = 22/38), EPC (n = 22/38), SPC (n = 12/20.6%), papillary DCIS (n = 2/3.4%). Only 02 patients were ER negative (Both IPC). HER-2 Neu was positive in 03 patients only, out of which 2 died of progressive disease (one EPC & one IPC). LN metastasis was present in 03 (5%) patients (one in each of 1st three types), only one died of bone metastasis who was also HER-2 Neu positive. All patients underwent upfront surgery except 02 patients who had synchronous IDC on contralateral breast. Breast conservation surgery (BCS) was performed in 34 (58.6%) and Mastectomy in 22 (37.9%) patients. 13 patients did not undergo invasive axillary staging, the rest of 43 (74%) patients did.32 SLNB, 11 ALND) Chemotherapy was given to 18 patients (31%), mostly to IPC (n = 12). Only 02 patients had bone metastasis (One was IPC & one EPC). Cancer related death was observed in 03 patients.

For all groups combined, 5 years OS was 98% and DFS was 92%

Conclusion: Overall, papillary carcinoma of breast has very good prognosis, even though lesser intense treatment modalities were used. Although it is still difficult to define the optimum management and to avoid over-treatment, given the limited data in literature.

No conflict of interest.

Poster Selective pectoralis major muscle denervation in retro-pectoral implant based breast reconstruction reduces capsular contracture rate.
Long-term single institution prospective case-control study
M. Bernini 1, S. Sordi 1, C. Tommasi 1, L. Tofani 1, A. Salerno 1, I. Meattini 1, D. De Benedetto 1, G. Biocchina 1, F. Di Naro 1, J. Nori Cucciarini 1, L. Livio 1, L. Orzalesi 1, 1Careggi Hospital Florence, Breast Surgery Oncology Department, Florence, Italy; 2University of Florence, Department of Statistic Computer Science, Florence, Italy; 3Careggi Hospital Florence, Radiation Oncology- Oncology Department, Florence, Italy; 4Careggi Hospital Florence, Diagnostic Senology Unit, Florence, Italy; 5Careggi Hospital Florence, Radiation Oncology, Florence, Italy

Background: Implant-based breast reconstruction (IBBR) continues to be the most used technique for breast reconstruction worldwide. Until few years ago the gold standard was to place the device in a retro-pectoral position but, recently, pre-pectoral breast reconstruction has gained a general success, due to better aesthetic outcomes and lower capsular contracture (CC) rates. Unfortunately, not all patients are good candidates for pre-pectoral IBBR and, in these cases, retro-pectoral technique remains a right choice. CC is a well-recognized complication following IBBR and represents a cause of discomfort, pain, poor cosmetic result and sometimes requires revision surgery especially in the retro-pectoral approach. The Pectoralis Major Muscle (PMM) selective denervation, in the retro-pectoral approach, is an innovative technical modification to avoid some pitfalls of the retro-pec IBBR. 

Material and methods: We prospectively selected a group of denervated retro-pec IBBR patients and compared them with not denervated patients. Group 1 included cases with selective PMM denervation and Group 2 patients without denervation performed in the same time span. In a previous study we analyzed the subjective opinion on the reconstruction outcomes by means of the BREAST-Q postoperative questionnaire, while, recently, we compared the same groups, with a minimum 24 month follow-up, from an objective perspective, evaluating CC rates by Baker scale, through outpatient clinic visits, performed by three independent breast cancer professionals.

Results: The overall median follow-up was 3.35 years and CC rate was significantly lower in Group 1, even adjusting for propensity score.

Conclusion: PMM selective denervation has gained a statistical association by women and seems to significantly reduce CC rate from an objective evaluation in the setting of retro-pectoral IBBR in our single Institution series.

No conflict of interest.

Poster Budget impact model for magnetic tracers in the detection of sentinel lymph nodes for operable breast cancer
L. Belarousi 1, C. Fabron 2, N. Lotenzstajn 2, R. Afif 3, G. Dietrich 3, E. Sauvanel 1, V. Talon 1, H. Beausser 3, S. Baffert 3, S. Alran 3, 1Paris Saint Joseph Hospital Group, Department of Gynecological and Mammary Surgery, Paris, France; 2CEMKA, Research, Bourg-La-Reine, France; 3Paris Saint Joseph Hospital Group, Department of Pharmacy, Paris, France; 4Paris Saint Joseph Hospital Group, Department of Clinical Research, Paris, France

Objective: The aim of this study was to evaluate the excepted budgetary impact of gradually adopting a magnetic tracer (MT) over a radioisotope tracer in the detection of sentinel lymph nodes (SLN) in operable breast cancer (BC) from the perspective of one French hospital without a nuclear medicine department.

Material and Methods: This study was conducted in a population of patients with operable breast cancer with SLN dissection. A budget impact model based on a prospective study conducted between April 2020 and March 2021 at Saint Joseph Hospital was developed. The model estimates the costs and revenues associated with an increase in the use of the strategy of SLN detection with a MT versus an isotope over a three-year time horizon.

Results: Fifty-four patients were included: 20 in the isotope group and 34 in the MT group. The operating time was not statistically different between the two groups (47 minutes for the MT versus 86 minutes for the isotope, p = 0.89). Secretarial time was higher in the isotope group (25 min more than for the TM group). On the basis of 383 patients who underwent surgery the first year and assuming an increase in activity of 10% per year for the standard-of-care strategy and 11.5% for the innovative strategy, the revenues and costs for the hospital are projected to increase for both strategies. However, the increased use of MT would result in an estimated cost to the hospital of 15,639 € (9.06 per patient undergoing surgery) over a three-year period.

Conclusion: The MT detection method provides autonomy to the surgeon in SLN detection. Its cost must be weighed against the simplification of the preoperative patient journey. Its use during the COVID-19 health crisis helped make patient journeys safer by avoiding visits to nuclear medicine departments, thus limiting the risk of infection.

No conflict of interest.

Poster The value of palpation, US and NMR in staging of axilla in patients with breast cancer in order to avoid unnecessary ALND

Background: Even carefully done, ALND carries the risk for late complications and SLNB have to be performed in modern breast cancer surgery as a conditio sine qua non. We want to point out the insufficiency of palpation as a traditional method of axillary examination and importance of radiological, primarily US, findings of ipsilateral axillary lymph nodes.

Material and Methods: The analysis included 173 patients with breast cancer operated in the General Hospital “Studenica” Kraljevo, from 10.03.2017. to 04.08.2019. Axillary examination was performed in all by palpation, in 951 by palpation and US (58%) and in 43 by palpation, US and NMR (25%). Preoperative findings were compared with the definitive PH findings of SLN or axillary dissects. The results were presented in a contingency table. The PPV, NVP, sensitivity and specificity were determined.

Results: By itself, the palpation had a false positive finding in 53%, a false negative in 36%, PPV 47%, NP 64%, sensitivity 49%, specificity 61%. Axillary US by itself had a false positive finding in 3%, a false negative in 25%, PPV
Close margins (no TOI to 2 mm) were associated with increased DR compared to negative margins (HR: 1.36, 95% CI: 1.1 to 1.69, p < 0.001) after adjusting for receipt of adjuvant chemotherapy. In 5 studies published since 2010, TOI margins were associated with increased DR (HR: 2.41 95% CI:1.81 to 3.21, p < 0.001) as were TOI or close margins compared to negative margins (HR: 1.44, 95% CI: 1.22 to 1.71).

Conclusions: Involved or close pathological margins after breast conserving surgery for early-stage invasive breast cancer are associated with increased DR and LR. These data suggest surgeons should aim to achieve a minimum clear margin of at least 1 mm. On the basis of current evidence, international guidelines should be revised.

Systematic Review Registration: PROSPERO: CRD42021232115

No conflict of interest.

74 (PB-074) Poster
The positive predictive value of breast lesions of uncertain malignant potential, their correlation with radiologic findings and their follow-up on a large single-institution series

M. Bemini1, F. Spolferi2, I. Meatti3, A. Salerno5, C. Tommasi1, L. Tofani4, D. De Benedetto5, G. Biccari6, F. Di Naro3, C. Bellini2, D. Morrone5, J. Nori Cucchiari7, S. Bianchi2, L. Livi8, L. Orzalesi9. 1Careggi University Hospital, Breast Surgery- Breast Unit- Oncology Department, Florence, Italy; 2Careggi University Hospital, Radiation Oncology- Breast Unit- Oncology Department, Florence, Italy; 3University of Florence, Department of Statistic-Computer Science- Applications, Florence, Italy; 4Careggi University Hospital, Diagnostic Senology Unit, Florence, Italy; 5Villa Donatello Clinic, Diagnostic Senology Unit, Florence, Italy; 6Villa Sistiana Clinic, Diagnostic Senology Unit, Lucca, Italy; 7Department of Surgery and Translational Medicine, Florence, Italy

Background: Up to 10% of histological diagnoses following needle core biopsy (NCB) or Vacuum-Assisted Breast Biopsy (VABB) are lesions of uncertain malignant potential (B3). This study aimed to investigate the most appropriate therapeutic approach based on the association between each subtype of B3 lesions and malignancy.

Methods: Histopathological reports from 228 patients who received a diagnosis of B3 lesion following NCB or VABB between 2009 and 2016, were retrospectively collected and analyzed. All patients underwent excisional surgery. Mammogram findings were virtually measured and compared with surgical specimens. Thereafter, the correlation between NCB/VABB diagnosis and cancer risk was calculated by simple logistic regression. In addition, the association [sp1] between malignancy upgrade and type of mammographic findings was investigated. Patients without a cancer diagnosis after surgery underwent a 9-years median follow-up.

Results: A total of 226 patients were included. Mean diameter of mammographic lesions was 1.8 ± 1.5 cm while for surgical specimen was 5.9 ± 9 cm (p < 0.01). The histopathology report showed 171 (76.3%) benign and 55 (23.7%) malignant lesions. In detail 111 (49.1%) atypical ductal epithelial proliferation (ADH), 40(17.7%) lobular intraepithelial neoplasia (LINs), 36 (15.9%) flat epithelial atypia, 19 (8.4%) radial scars, 9 (3.9%) phyllid tumours and 9 (3.9%) papillary lesions. PPV of B3 patients referred to surgery was 24.3% (p < 0.05) including 31 (13.7%) ductal carcinoma in situ (DCIS), 24 (10.6%) invasive carcinoma, and 1 (0.4%) malignant phyllid tumor. Relevant upgraded lesions were ADH with an overall upgrade rate of 34.2% (21.6% to DCIS and 12.6% to invasive carcinoma, p < 0.05) and LINs with an overall upgrade rate of 27.5% (15% to invasive carcinoma and 12.5% to DCIS, p < 0.05). The morphology of mammographic microcalcifications and tumor at operative histology were correlated (p < 0.05). After a 9-year median follow-up, 15 (6.9%) patients without tumor post-surgery were diagnosed with carcinoma and 7 (4%) with a new B3 lesion.

Table 1: Positive predictive value (PPV) of malignancy in B3 lesions by comparing post operative diagnosis with NCB/VABB diagnosis.

<table>
<thead>
<tr>
<th>NCB/VABB</th>
<th>PPV (%)</th>
<th>Malignancy Odds</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEA</td>
<td>36 (15.93)</td>
<td>6.8 (9.19)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>LIN</td>
<td>40 (17.70)</td>
<td>27.5 (16–44)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>ADH</td>
<td>111 (49.12)</td>
<td>34.2 (26–44)</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>RS</td>
<td>19 (8.41)</td>
<td>2.6 (1.71)</td>
<td>0.51</td>
</tr>
<tr>
<td>Phyllid tumor</td>
<td>9 (3.98)</td>
<td>2.435 (2.52)</td>
<td>0.43</td>
</tr>
<tr>
<td>Papillary lesion</td>
<td>9 (3.98)</td>
<td>35 (12–68)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Other</td>
<td>2 (0.88)</td>
<td>0.17 (6.89)</td>
<td>0.61</td>
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</tbody>
</table>

Total 226 (100%) | 55 | 24.34 (19–30) | <0.05 |

No conflict of interest.

Abstracts, EBCC-13
Conclusions: According to the results of this study, ADH and LNs still require surgical excision for their significant PPV of malignancy. For other histological lesions, significance has not been reached, or the confidence intervals were too wide to confirm the utility of surgical excision. No conflict of interest.

75 (PB-075) Poster
The place of videos illustrating the techniques of breast surgery in the procedural training of residents in gynecology

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Background: In Tunisia, breast cancer is the leading cancer in women representing 30% of all female cancers. Mastery of breast surgery techniques is one of the objectives of the overall training of gynecology residents and one of the main skills required of medical specialists in gynecology.

The acquisition of this technical skill is not based exclusively on the psychomotor domain, but requires skills in the cognitive domain as well. The main model used in procedural training is observation theory.

The aim of the study was to assess the impact of video-based learning on learning new procedures and updating surgical skills among residents in gynecology, as well as the criteria for choosing these videos.

Material and methods: This is a descriptive cross-sectional study among gynecology residents of the maternity center of Sousse, Tunisia. We included Residents of gynecology who practice or have practiced in the maternity center of Sousse and who accepted to answer our anonymous questionnaire.

Data collection was carried out via a pre-established anonymous questionnaire sent by personal e-mail to residents.

Results: A total of 43 residents answered the questionnaire. The majority of respondents (76.7%) were and 19 respondents (44.2%) were in their terminal year of residency. Overall, 36 residents (83.7%) answered that they had already used videos to prepare for breast surgery. The main video sources used were youtube (69.4%) and Medtube (11.1%). The characteristics of the most appreciated video were presence of narration (21.6%), presence of illustration for didactic purpose (18.9%); image quality (16.2%), real time surgery videos (16.2%) and breast surgery done by a renowned surgeon (13.5%). The frequency of video use was once or twice a month in (26.8%) of cases, once a week (36.6%), several times a week (19.5%), the optimal time for viewing the video was the day before the operation (34.2%), throughout the residency period (26.8%) or after participation in the operation for better memorization (13.2%).

Finally 100% of residents recommend to their colleagues the use of videos for self-education in breast surgery.

Conclusion: Video-based learning seems to be a preferred method of surgical preparation among residents. Based on these findings we believe that the creation of quality and scientifically accurate videos appears to be the future landscape for video-based learning.

No conflict of interest.

76 (PB-076) Poster
The effect of intra-operative margin assessment during breast conserving surgery for breast cancer in a Dutch cohort

S. Woudrik1, E. Van de Voort1, T. Klem1. 1Stichting Borstkankeronderzoek Rotterdam, Francisca Gasthuis & Vlietland, Surgery, Rotterdam, Netherlands

Background: In the Netherlands, 60% of all breast cancers are screening detected and not palpable on physical examination. Pre-operative tumour localisation is therefore essential to perform an oncological complete resection while preserving healthy breast tissue and good cosmesis. Intraoperative digital specimen mammography (IDSM), in which a 2-view mammography of the specimen without compression is made in the operation room, is an alternative to conventional specimen radiography (CSR) that has the benefit of providing immediate specimen evaluation and potentially decreasing operation time. Additionally, IDSM can reduce positive margins and re-excision rates. IDSM was implemented in our hospital in 2017. The objective of this study was to evaluate if the use of IDSM has measurable advantages over CSR.

Materials and methods: This is a monocentre retrospective cohort study with two groups: before and after implementation of IDSM. The primary outcome was mean duration of surgery. Secondary outcomes were number of re-excisions, number of positive margins, specimen weight and number of shaves. An unpaired t-test was used to compare duration of surgery and specimen weight between the two groups. A Chi-square test was used to compare the number of re-excisions and the number of positive margins in both groups.

Results: There were no significant difference in duration of surgery after implementation of IDSM. A possible explanation could be that the sentinel node procedure is frequently performed during the waiting period of the radiology result and that the radiology department was within 4 minutes walking distance from the OR. The number of re-excisions and the number of positive margins did not differ between both cohorts. This may be because these numbers were already quite low in our hospital. Further analyses will follow.

No conflict of interest.

77 (PB-077) Poster
Initial experience with targeted axillary dissection (TAD) guided by ultrasound in early-stage node positive breast cancer patients undergoing upfront surgery

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Background: Since publication of ACOSOG Z0011 trial, the standard of care for early-stage breast cancer patients with 1–2 positive sentinel lymph nodes (SLN) is to avoid completion of node dissection, assuming the risk of leaving additional positive non-SLN in 27% patients without a detrimental effect on their disease free survival (DFS) or overall survival (OS).

The National Comprehensive Cancer Network (NCCN) in recent editions of their clinical guidelines recommended to extent this indication to patients that present with biopsy proven positive disease if only 1 or 2 suspicious nodes are found on imaging and the other eligibility criteria from the Z0011 study are otherwise met. This recommendation is based on an expert consensus and no prospective study has yet ascertain if it is the optimal approach to stage the axilla in this patient population with risk of higher nodal disease load and extracapsular invasion.

Material and Methods: Between February 2019 and July 2022 patients with estrogen receptor positive (ER+) early-stage breast cancer (ct1–2 with limited nodal disease by ultrasound (CN1), defined as only 1 or 2 suspicious nodes confirmed by biopsy, were included. Once neoadjuvant systemic treatment was ruled out by medical oncologist, upfront surgery was proposed performing a TAD including removal of SLN and metastatic node biopsy, which previously was marked with an ultrasound visible marker (hydromark®). SLN and clipped node retrieval were performed using radioactive dye (Tc99) ± blue dye and intraoperative ultrasound guided surgery, respectively. Completion node dissection (CND) was not mandatory, but recommended if the clipped positive node or SLN were not removed.

Results: A total of 13 patients were included. Except one patient, all were postmenopausal women with a median age of 72 years. Most frequent histology was invasive ductal carcinoma (10/13) and luminal A like subtype (10/13). SLN and clipped node were successfully retrieved in 10/13 and 13/13, respectively. Clipped node was confirmed to be positive in all cases (13/13), but SLN was reported as negative in 3/10 patients. None of the patients reported 3 or more positive nodes with TAD. However, CND was performed in 8/13 patients finding additional positive nodes in node dissection in 5/8 patients, of which 2 were upstaged to pN2a.

Conclusions: Early-stage clinically node positive breast cancer patients seem to have a higher node disease burden than patients with metastases found incidentally in SLN biopsy. Prognostic impact of this residual node disease, taking into account systemic therapy and radiotherapy, remains unknown. Retrieval of clipped node by ultrasound guided surgery has been shown to be a feasible and confident technique.

No conflict of interest.
The Impact on Management and Outcomes of Benign and High-Risk Breast Lesions After the Introduction of Vacuum Assisted Excision

S. Wouda1, E. Van de Voort1, T. Klem2, G. Struk1, E. Birnie1, R. Sinke1, M. Maccio1, K. Verhoef5.

Background: For benign lesions up to 3 cm, previous studies have shown that vacuum assisted excision (VAE) is a safe and effective alternative for surgical excision. However, the use of VAE for the management of high-risk lesions is controversial and guidelines are ambiguous. This study describes the impact of the implementation of VAE in terms of management and outcomes.

Methods: A single centre retrospective cohort study with two cohorts: 'before' and 'after' implementation of VAE was conducted. All patients with a benign or high-risk lesion excised by VAE or surgical excision (SE) from 2016 up to 2019 were included. Excision, complication and upgrading rates were compared using Chi-square or Fisher’s exact test. Cox regression was used for the evaluation of local recurrences and re-excisions.

Results: A total of 103 surgically excised lesions in the before, and 216 lesions in the after cohort (98 SEs, and 118 VAEs) were included. After implementation, Benign lesions were significantly more often managed by VAE (101/164, 62%, p = 0.001). Re-excision, recurrence, and complication rates were comparable between the two cohorts (3.9% versus 3.7%, p > 0.99; 2.9% versus 1.9%, p = 0.750; 4.4% versus 6.7%, p = 0.595), also for high-risk lesions separately.

Conclusion: VAE can be implemented safely and effectively for both benign as high-risk breast lesions. After implementation, recurrence, re-excision, upgrade and complication rates remained low even for high-risk lesions.

No conflict of interest.

FBM078

Nipple-sparing mastectomy with primary breast reconstruction: Breast cancer local recurrence according to molecular subtype

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Background: The purposes of this study were to assess local recurrence in breast cancer patient after nipple-sparing mastectomy with primary breast reconstruction relative to 1) Ki67 values and molecular subtypes of the initial lesions and 2) size of the initial tumor and size of the implant.

Materials and Methods: 156 breast cancer patients mean age of 51.5 years (26–75) who underwent nipple sparing mastectomy (NSM) with primary implant breast reconstruction were analyzed. Mean follow up was 59 months (17–85). Molecular subtypes, Ki67 values, estrogen receptor (ER), progesterone receptor (PR) and Her2 status were recorded for each patient. Additionally, information regarding the size of implant and initial tumor size were collected. The information was used to assess for local recurrence. For univariate analyses of risk factors Chi-square and t test for independent samples were used. For the multivariate analyses, a Cox proportional-hazards model was used.

Results: NSM was primary treatment for breast cancer in 122/156 (78.2%) patients while 34/156 (21.8%) patients received neoadjuvant chemotherapy (NSM) with primary implant breast reconstruction were analyzed. Mean follow up was 59 months (17–85). Molecular subtypes, Ki67 values, estrogen receptor (ER), progesterone receptor (PR) and Her2 status were recorded for each patient. Additionally, information regarding the size of implant and initial tumor size were collected. The information was used to assess for local recurrence. For univariate analyses of risk factors Chi-square and t test for independent samples were used. For the multivariate analyses, a Cox proportional-hazards model was used.

Conclusion: In this patient cohort low ER and PR expression were risk factors for local recurrence of breast cancer. Ki67 status and molecular subtypes were not statistically significant risk factors for local recurrence.

No conflict of interest.

Poster Session
Efficacy of pre-operative axillary ultrasonography in excluding nodal disease—can it replace sentinel lymph node biopsy in early stage breast cancer?

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Background: We designed this study to determine the false negative rate (FNR), negative predictive value (PPV) and the factors predicting false negativity of pre-treatment axillary ultrasound (AUS).

Materials & methods: We retrospectively selected patients with normal lymph nodes on ultrasound, T1, T2 or T3 tumors, invasive cancer, who underwent sentinel lymph node biopsy (SLNB), between January 2019 and December 2020 at Shaakat Khanum Memorial Cancer Hospital, Lahore, Pakistan. Ultrasound findings were compared with the SLNB results, dividing our study population into False Negative (FN) and True Negative (TN) groups. Clinical, radiological, histopathological parameters and therapeutic strategies were compared between the two groups.

Results: Out of 781 patients, 627 (80.2%) had TN, while 154 (19.7%) had FN ultrasound results, with NPV of 80.2%. On univariate analysis, initial tumor size, histopathology, tumor grade, receptors, timing of chemotherapy, and type of surgery were found to have statistically significant differences between the FN and TN AUS groups. On multivariate analysis, tumor size, grade, Progesterone receptor, and human epidemic growth factor receptor 2 (HER2 neu) status were found to be the significant predicting factors for FN AUS results. Larger, high grade, PR negative and HER2 neu positive tumors were found to be associated with lower FNR on AUS.

Conclusion: Axillary ultrasound is effective in ruling out axillary nodal disease especially in patients with high burden axillary disease, aggressive tumor biology, larger tumor size and higher grade. However, we should be especially cautious while interpreting the results of AUS in case of lobular histology.

No conflict of interest.

Quality of life and lymphedema incidence after axillary surgery in pN1 breast cancer patients: lymphadenectomy vs. Sentinel lymph node biopsy

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Introduction: In the last decade, there has been a paradigm shift in axillary management in patients with breast cancer: the possibility of avoiding axillary lymph node dissection (ALND) in a specific group of breast cancer patients with axillary disease, to decrease the axillary surgery-related morbidity.

Objectives: To Assess the impact on the quality of life (QoL) of ALND vs. Sentinel lymph node dissection (SLN) associated with radiotherapy for patients with node-positive breast cancer. To Appraise the incidence of lymphedema after axillary therapy in both groups.

Methods: Retrospective observational study of surgery patients with node-positive breast cancer (pN1), at a university center from 2018 to 2019. In addition, a cross-sectional study was performed between May to July 2022 to assess the incidence of arm lymphedema measured by circometry and appraise QoL. We use the QLQ-3R23 questionnaire to assess the general QoL, and ULL-27 questionnaire to appraise the specific QoL scale in upper limb lymphedema, both for Spanish population.

Results: 114 patients completed the questionnaires and measurements: 68 ALND patients and 46 SLN, with 40.8 months postoperative follow-up. The scores on both questionnaires were similar in all dimensions explored in both groups of patients, with significant clinical or statistical differences. In the lymphadenectomy group, the incidence of lymphedema was higher (32.4% vs 10.9%; p = 0.006). The QoL of lymphedema patients were globally similar than no lymphedema patients, but the QoL of symptomatic lymphedema was worse (BR-23: perspective dimension 56.9 vs 72.4, p = 0.002; sexual function 61.6 vs 77.9 p = 0.002 and ULL-27 (best 0 worse 100): physical dimension 37.8 vs 19.1 p = 0.003).

Conclusions. The axillary node dissection does not produce a significant impact on the quality of life of patients with breast cancer and axillary
involvement, despite developing lymphedema more frequently. The symptomatic lymphoma patients have worse quality of life.

No conflict of interest.

85 (PB-085) Poster
Fluorescence guided fully endoscopic axillary dissection for locally advanced breast cancer. A feasible novel technique
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Background: Axillary dissection for breast cancer has become a less needed procedure during recent years, mainly because of the downstaging reported after neoadjuvant systemic treatment.

However, there is still a few scenarios in which a patient can benefit from a complete axillary dissection, this is the case in high axillary tumor burden (T2-3) or absence of complete radiologic axillary response after neoadjuvant chemotherapy (NAC).

Our group has been performing SLNB with indocyanine green (ICG) since 2018, and has also actively developed endoscopic techniques.

Material and methods: We inject 0.5 ml standard concentration ICG into the subdermal periareolar space, then we approach axillary dissection, using 3 balloon trocars in the lateral aspect of the ipsilateral thorax on the subcutaneous layer.

We insufflate low pressure CO2 to open a virtual space in which we are able to identify all the anatomical landmarks, to limit our dissection as we would in open surgery, there are certain differences in the sequence in which we approach these anatomical landmarks, for example, we start by identifying the neurovascular pedicle of the Lattissimus Dorsi muscle from its insertion towards the axillary vein, then we dissect the vein medially and look for the long thoracic nerve. During this dissection we also identify and preserve the intercostobrachial plexus, and in the end, we are able to see our fluorescent lymphatic nodes within the axillary fatty tissue that remains on the upper aspect of our surgical field and we proceed to dissect and extract it through the most distal trocar (Hasson) used for the optic. We then place a drain through one of the 5 mm trocar incisions.

Results: From February 2021 to December 2021 we performed 7 procedures, all of the patients had previously received NAC due to locally advanced disease, axillary dissection was indicated due to initial stage N2 or above (2 cases) or absence of complete response after NAC (5 cases). All patients had simultaneous breast preserving surgery on primary tumor (oncoplastic periareolar approach). The average number of lymph nodes dissected was 17 (8–32) with a median of 2 (0–9) affected nodes.

We did not register any complications during follow up, patients refer satisfactory outcomes in terms of upper limb function, pain control and sensibility preservation on internal aspect of the arm, this information was gathered during outpatient follow up of 8–18 months.

Conclusions: Fully endoscopic approach for axillary dissection with ICG is an oncologically safe alternative for locally advanced breast cancer patients who would benefit from this procedure. The experience in terms of recovery and function preservation are promising, and we believe that learning curve and technical aspects need further investigation, as well as long term follow up to assess possible reduction in lymphoedema and other complications.

No conflict of interest.

86 (PB-086) Poster
Magnetic delayed sentinel lymph node dissection in primary systemic therapy. Implications for enhanced axillary mapping (Update)
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Background: Superparamagnetic iron Nanoparticles (SPIO) have been used for Sentinel Lymph Node Detection in breast cancer with equivalent efficacy to Radioisotope (RI) ± blue dye while facilitating logistics and leading to successful SLND even when injected up to eight weeks before surgery. However, neither the role of SPIO for SLND after primary systemic therapy (PST) nor the maximum timeframe from SPIO administration to successful SLND have been adequately defined.

Methods: Patients originally cN0/I planned for PST were included. All with cN0 axilla underwent SLND while patients with cN1 who converted to cN0 received targeted axillary dissection (TAD) with a paramagnetic clip. All patients received SPIO either before PST or before surgery and RI was injected on the day of surgery.

Results: In total, 114 patients were included in the analysis (median age 56 yrs; iqr 45, 63, median BMI 25.1 kg/m²; iqr 22.9, 28.4), of which 91 (79.3%) received chemotherapy ± targeted therapies and 23 (20.2%) endocrine therapy. SLND was performed in 81 (71.1%) and TAD in 33 (28.9%) of patients. SPIO was injected within a week to surgery in 74 (64.9%) patients and longer than a week before in 40 (35.1%), in a median of 2 days (range 0–248) for the entire cohort. At least one SLN was detected in 97.4% with SPIO and 92.1% with RI (p = 0.149) while the combination was successful in 100%. At least one SLN was concordant for SPIO and RI in 83.3% of patients. The median (iqr) lymph node yield was 3 (2.4) for SPIO, 2 (2.3) for RI and 3 (2.4) for the combination (p < 0.001). Time from SPIO injection to surgery affected detection (Spearman’s rho: 0.194, p = 0.039) but not number of SLNs (rho: −0.059, p = 0.511) or concordance per patient (rho: −0.057, p = 0.544). The addition of SPIO to RI significantly increased overall detection rate (difference 7.9%, p = 0.008), but the addition of RI to SPIO did not significantly improve overall detection (difference 2.6%, p = 0.248).

In patients undergoing TAD (n = 33), detection was 100% for SPIO and 90.9% for RI (p = 0.248). The index node was magnetic in 89.3% and radioactive in 64.3% (p = 0.035), an outcome not affected by any factors.

A median (iqr) of 1 (1.2) axillary metastases were found in 25 patients (21.9%), SPIO detection was 100% and RI detection was 70.8% (p = 0.023). SPIO detected more metastatic SLNs than RI (median[iqr] 1 (1.1) vs 1 (0.1); p = 0.005). In completion ALND, additional metastatic nodes were found in one patient (4%).

Conclusions: In this well-defined single-arm cohort study, SPIO performed comparably to RI, but detected more SLNs and had higher detection of metastatic SLNs. Injection before PST is not only feasible, but does not seem to affect concordance with RI. These findings support the use of SPIO in PST patients and motivate more dedicated research in the concept of delayed SLND in this setting.

No conflict of interest.

87 (PB-087) Poster
The role of axillary staging in patients with Ductal Carcinoma In Situ (DCIS) on diagnostic tissue biopsy
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Background: There is an inherent risk of overestimating the risk of co-existing invasive disease in patients with DCIS on a diagnostic core needle biopsy. This results in a potential escalation of surgical intervention with the introduction of a diagnostic SLNB for the synchronous staging of the axilla which may result in additional morbidity. Patients with pure low-grade DCIS (LG DCIS) do not benefit from SLNB at the time of their primary surgery as the incidence of upgrade to microinvasion/ invasion is very low. We, therefore, restricted the scope of this study to look at the role of SLNB in Intermediate-Grade DCIS (IG DCIS) and High-Grade DCIS (HG DCIS) only.

Methodology: We conducted a retrospective study of patients diagnosed with IG DCIS and HG DCIS on image-guided diagnostic needle biopsy from July 2016 to October 2020 at Guys Hospital, UK, a tertiary academic cancer centre. Patient-level data were obtained from electronic hospital records following approval from the Trust Audit Committee. We looked at all patients that underwent either, a wide local excision (WLE) or a mastectomy with immediate reconstruction. Patients who underwent another procedure elsewhere were also excluded.


**Results:** In all, 81 patients with IG and HG DCIS comprised the whole cohort. After exclusion, a total of 15 with pure IG DCIS and 46 with pure HG DCIS on diagnostic biopsy were included for analysis. Total upgrade rate from IG DCIS to invasion/microinvasion was 20%. SLNBs were performed on 9 patients in the IG DCIS cohort, the total incidence of node positivity was 0%. Total upgrade rate from HG DCIS to invasion/microinvasion was 30.4% (14/46). SLNB was performed in 29 patients in the HG DCIS cohort. In all, 10.3% (3/29) patients had a positive sentinel lymph node, 2 harboured macrometastases (6.6%) and 1 had micrometastasis. The total incidence of node positivity in HG DCIS was 6.5% (3/46). No further axillary surgery was performed on any of these patients. They were considered “low burden” disease as per ACOSOG Z11/AMAROS criteria and 1 patient had additional tangents of RT to cover mid axilla.

**Conclusion:** This data demonstrates that there is no role of SLNB in patients with IG DCIS. While the incidence of node positivity was 6.5% for HG DCIS, the surgical management of the axilla did not change further in the 3 patients with a positive SLN. The results of the SENTINOT study are hypothesis-generating with effective use of superparamagnetic iron oxide (SPIO) in identifying SLN at a later stage in women undergoing surgery for DCIS, thus avoiding SLNB in 78.3% patients. We propose conducting larger trials to test the efficacy and safety of SPIO in patients undergoing mastectomy for HG DCIS due to their risk of invasion which will also avoid morbidity associated with SLNB.

**No conflict of interest.**

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**90 (PB-090) Poster**

**Accuracy of pre-operative axillary US and biopsy in breast cancer patients**


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**Background:** Axillary lymph node status is an important factor in prognosis and treatment decision making of breast cancer. Ultrasound scan (US) is a useful tool in pre operative assessment axilla in patients with breast cancer and plays a pivotal role in the surgical management of axilla, sentinel lymph node biopsy (SLNB) vs axillary lymph node clearance (ALNC). The sensitivity of pre operative axillary US varies widely among centres, however the standard for the identification of metastatic axillary lymph nodes on preoperative ultrasound and biopsy is 40–50% as per NICE Guidelines. The aim of this study is to assess local adherence to these targets through highlighting positive sentinel lymph node biopsy results in clinically node negative patients.

**Material and methods:** A retrospective study including all symptomatic patients with biopsy confirmed breast cancer in 1 year time frame, who had axillary US with or without biopsy prior to curative breast cancer surgery at a local breast unit. Data was collected by reviewing digital case records of patients. Radiology, surgery and Pathology reports were reviewed to obtain required information about results of pre operative axillary US with biopsy, intraoperative assessment of sentinel lymph node biopsy on OSNA and axillary node clearance.

**Results:** A total of 170 patients had US with or without nodal biopsy for pre operative axillary US and 32 had biopsy prior to breast cancer surgery. 131 had normal axillary US while 39 patients with abnormal or indeterminate lymph nodes on US had axillary node biopsy. 14 out of 39 had benign biopsy results while 25 patients with positive nodes proceeded directly to ANC. Out of 145 patients who underwent SLNB procedure, 26 had positive SLNB. 16 macrometastasis and 10 with micrometastasis on OSNA. The sensitivity of pre operative axillary ultrasound nodal found to be 60% and accuracy 90%.

**Conclusion:** Our local practice for ultrasound sensitivity is 60% which is above guidelines set by RCR and NICE. 25 patients with positive axilla on pre operative ultrasound and biopsy were spared the additional step of SLNB.

**No conflict of interest.**

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**91 (PB-091) Poster**

**Effect of socio-economic status and acculturation on breast cancer screening in Asian American women**


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**Background:** Racial groups in the United States (US) have lower breast cancer (BC) screening rates than white Americans. Asian Americans groups experienced increasing incidence of BC. Data is limited on BC screening participation in this population.

**Aim:** To study the effect of socioeconomic status (SES) and acculturation (adaptation to local culture) on: screening mammogram participation, knowledge of BC symptoms/risk factors and on barriers to seeking medical care, in Asian American women of Chinese and Hindi origin from 4 counties around Mayo Clinic, Rochester, Minnesota, USA.

**Methods:** We identified females older than 39 years of age, without BC, of Chinese and Hindi ethnicity, residing in 4 counties in Minnesota, in the Rochester Epidemiology Project (REP) database.

We mailed out a survey containing the Suinn-Lew Asian Self-Identity Acculturation (SL-ASIA) scale and the Breast Cancer Awareness Measure (CAM), both in English and Chinese or Hindi translations.

SL-ASIA scores range from 1 (mostly Asian) to 5 (mostly Westernized).

The CAM tool surveys mammogram behaviors, BC symptoms/risk factors (score 0–3) and barriers to seeking medical care. Mammogram participation was also derived from the REP database.

SES was measured through the HOUSES index, a measure of the value of the participant’s property, derived from the home address and scored as quartiles from 1 to 4 (higher numbers = higher SES).

We performed univariate logistic regression analysis between SES and acculturation with the following outcomes: mammogram participation, BC knowledge, barriers to medical care.

**Results:** 553 women were eligible, 82 (15%) responded, 53 Chinese and 29 Hindi. Mean age of responders was 57 (57 for non-responders), mean mammography score was 2.3 for Chinese and 2.6 for Hindi. Of the responders, 5% had HOUSES index = 1, whereas 62% had HOUSES index = 4. The non-responders (N = 471) had a significantly lower SES than the responders, with 26% having a HOUSES index = 1 (p = 0.0004).

Of the responders, 96% by self-report and 92% by REP database had a mammogram within the last 1.5 years, representing good screening participation as opposed to 41% of non-responders (p = 0.001).

**Conclusion:** Our study shows that preservation of the intercostobrachial nerve is associated with significantly reduced pain in the chest wall, axilla, and arm, lesser sensory changes, and improved quality of life.

**No conflict of interest.**
35\% had no BC knowledge (score of 0), 64\% had some knowledge. 50\% identified barriers to medical care.

SSES or acculturlation level had no significant impact on mammogram participation, BC knowledge or barriers to medical care within responders.

Conclusions: Responders had a very high mammogram participation, despite low BC knowledge and significant number with barriers to medical care. SES and acculturulation did not influence these outcomes. Our study is limited by the low response rate (15\%), higher SSES in responders and significantly lower mammographic participation in non-responders. Interventions to increase BC screening, knowledge and remove barriers to medical care at community level are needed.

No conflict of interest.

93 (PB-093)
Poster
Causes and consequences of delayed diagnosis in breast cancer screening; focus on mammographic features and tumour characteristics
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Background: Early detection of breast cancer is associated with more favourable outcomes, concerning tumour characteristics, risk of lymph node metastases and final surgical outcome. However, delay in breast cancer diagnosis is not uncommon. The current study aims to gain more insight in the prevalence, causes and consequences of delayed breast cancer diagnosis by analysing delayed screen-detected cancers as well as interval cancers.

Materials and methods: This retrospective study, using a prospectively obtained database, was performed in women who received biennial screening mammography between January 1, 2009 and June 30, 2019. All mammograms were reviewed by two of the in total four participating screening radiologists. Patients were divided into 3 groups; women with screen-detected breast cancer without a diagnostic delay, women with a primary diagnostic delay (i.e. minimal sign or missed in previous screening round) and women with a delay in diagnostic work-up. Women with a true interval cancer were excluded. Outcome parameters included mammographic and tumour characteristics, lymph node status and surgical treatment.

Results: A total of 423 women experienced a delay of at least 4 months; 394 women with a primary diagnostic delay and 29 women with a delay in diagnostic work-up, respectively. Median time of delay in women with a delay in diagnostic work-up was 8 months (range 4–48) versus 12 months (range 4–97) in women with a primary diagnostic delay. Compared to the control group, women with a delay in diagnostic work-up showed no differences in mammographic and tumour characteristics, nor in final surgical outcome. Causes of delay in this group were mainly a BIRADS 3 routing or incorrect clinical BIRADS classification, resulting in a mean delay of 9 months (range 6–23) and 19 months (range 6–48), respectively.

Women with a primary diagnostic delay had higher breast tissue density (p < 0.001) and showed more subtle abnormalities on mammography (i.e. architectural distortion and asymmetries, p < 0.001). Moreover, this group comprises larger tumours (p < 0.001), more triple-negative tumours and lymph node metastases (respectively p = 0.04 and p < 0.001). This resulted in more mastectomies (p = 0.04).

Conclusions: Screened women with a primary diagnostic delay in breast cancer diagnosis show less favourable tumour characteristics and relatively more mastectomies compared to women with a delay in diagnostic work-up after recall.

No conflict of interest.

94 (PB-094)
Poster
Real world evidence from a Breast Screening pilot for the underprivileged: Experiences from Bruhat Bengaluru Mahanagara Palike hospitals
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Background: In India, less than 5\% of women get routine screening for breast cancer due to lack of awareness and the absence of a coordinated national breast cancer screening programme. A community health initiative was launched by Niramai in collaboration with City Health officials in Bangalore as a pilot to increase awareness and make breast health screening available to all. Free breast cancer screening using AI powered Thermalytix test is being offered to all the underprivileged women walking into Bruhat Bengaluru Mahanagara Palike (BBMP) government hospitals from November 14, 2017 till today (after a break for 15 months during COVID).

Materials and methods: This observational study was conducted in 22 BBMP-affiliated primary health centers where outpatient women over the age of 18 years and not pregnant were enrolled. The procedure included a briefing on camp procedures, taking patient consent, identification of eligible candidates, general health education, and conducting the Thermalytix test by a healthcare worker who was trained to use the Thermalytix software tool. Women were triaged using the output generated by Thermalytix 180. Those triaged as red were referred for further detailed imaging investigation in a district hospital using mammography, ultrasound and FNAC/biopsy.

Results: A total of 6935 women underwent Thermalytix screening in 22 BBMP hospitals during Nov 2017 to July 2022. A total of 1687 participants were excluded from the analysis as they did not meet the eligibility criteria. The median age of the 5248 eligible participants was 42 years (range 18–86). Among them, 90 women (1.71\%) had previously noticed a lump in their breast, 431 women (8.12\%) had breast pain, 16 women had complained of nipple discharge, and 5 women had noticed skin discoloration. When screened, 62 (1.2\%) women were detected with abnormalities and triaged positive by Thermalytix. Among them 11 women have so far gone through diagnostic investigations, of which 8 were radiologically positive and were recommended for histopathology correlation. The overall test positivity rate of Thermalytix in this cohort was 1.2\% and positive predictive value with radiological positivity as reference was found to be 9/11 = 81.81\%. Further histological analysis reported 1 DCIS and 8 benign fibroadenoma. The tests were conducted in screening camps and the average cost of conducting the test in the field came to around 6.5 USD per person.

Conclusions: Thermalytix could be a potential automated screening tool for population-level screening in resource constrained settings. The portable equipment enabled easy movement across different PHCs. Since it is a privacy-aware test, there was no need to give consent to participate in the test. Community mobilization with the help of the local government health officials was crucial to ensure walk-ins.

Conflict of interest:
Ownership: yes
Board of Directors: yes
Corporate-sponsored Research: yes

95 (PB-095)
Poster
Evaluation of effect of post-biopsy mammogram on marker clip migration after Stereotactic-Guided Core Needle Breast Biopsy
L. Baker, University Sussex Hospitals, Breast Care Unit, West Sussex, United Kingdom

Background: Stereotactic Core Needle Biopsy (SCNB) is a standard technical procedure for the sampling of suspicious lesions, particularly microcalcifications identified on mammography. A marker clip (HydroMark) is deployed at the site of biopsy to localize the area at future mammograms or imaging investigation in a district hospital using mammography, ultrasound and FNAC/biopsy.

Materials and methods: This retrospective study collected data from patient pre-recorded quantitative data from patients who required a Stereotactic Core Needle Biopsy (SCNB) for micro-calciication under symptomatic GP referral or NHBSP assessment recall between June 2020 and June 2021. One marker clip brand/type was used ‘HydroMark’.

Objective: The aim of this study was to determine whether the order of projections performed first, for the post-biopsy mammogram, contributed to marker clip migration — same as or orthogonal to the projection used during a stereotactic-guided core needle biopsy.

Methods: This retrospective study collected data from patient pre-recorded quantitative data from patients who required a Stereotactic Core Needle Biopsy (SCNB) for micro-calciication under symptomatic GP referral or NHBSP assessment recall between June 2020 and June 2021. One marker clip brand/type was used ‘HydroMark’.

Conflict of interest:
Board of Directors: yes
Ownership: yes
Corporate-sponsored Research: yes

Abstracts, EBCC-13
The SCNB were separated into one of the following groups, depending on which post-biopsy mammogram view was obtained first:

- Group A: first view on the postbiopsy mammogram obtained in the same projection as that used during the SCNB.
- Group B: first view on the postbiopsy mammogram obtained orthogonally to the projection used during the SCNB.

**Results:** 150 SCNB cases in total were recorded during the time-period. The mean age was 64 years of age for both group A and B. The range of ages included 50 to 86 years of age.

<table>
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<tr>
<th>Group A</th>
<th>Group B</th>
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<tr>
<td>78 out of 150 were in group A.</td>
<td>72 out of 150 were in group B.</td>
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<tr>
<td>Group A had 18 cases of migration.</td>
<td>Group B had 60 cases of migration.</td>
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<td>Group A (18 out of 78) had clip migration distances of = (76.9%, &lt;10 mm; 20.5%, 10–20 mm; and 2.6%, 21–30 mm).</td>
<td>Group B (60 out of 72) had clip migration distances of = (16.7%, &lt;10 mm; 38.8%, 10–20 mm; and 44.4%, 21–30 mm).</td>
</tr>
</tbody>
</table>

The mean displacement distance was 15.3 mm in group A and 19.7 mm in group B. The mean displacement distance was ~4.4 mm with a bootstrap confidence interval from 10 mm to 30 mm.

**Conclusion:** The type of projection used to obtain the first view on the post-biopsy mammogram, relative to that used during the Stereotacatic Core Needle Biopsy (SCNB), had a statistical significance to the effect of biopsy marker clip migration.

**No conflict of interest.**

**96 (PB-096) Poster**

**Update of the European Breast Cancer Guidelines for Screening and Diagnosis: priority questions and new topics**

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**Background:** The European Guidelines for Screening and Diagnosis of Breast Cancer are evidence-based and developed within the European Commission Initiative on Breast Cancer (ECIBC). They are developed by a multidisciplinary group (GDG) of selected experts following the GRade approach and include the use of 'Evidence to Decision' frameworks.

**Material and methods:** To ensure the provision of up-to-date guidelines' recommendations, the European Breast Guidelines periodically go through a structured updating strategy. This strategy consists of four phases (prioritisation, surveillance, updating, publication), it considers if new evidence may affect existing recommendations and allows the introduction of new Healthcare Questions (HQs).

**Results:** In December 2020, the GDG started the second round of updating the European Breast Guidelines. Out of the 10 recommendations initially prioritised as relevant for surveillance, 7 required a complete update. Those recommendations pertained to imaging techniques in screening and surgical treatment planning. Decision Aids, and the need for organised screening programmes in women aged 45 to 49. Through online meetings, the GDG evaluated the updated evidence and 5 out of 7 recommendations were unmodified, while the recommendations focusing on Digital Breast Tomosynthesis in women with dense breasts were subject to changes. In addition, new HQs addressing Artificial Intelligence to support the reading of mammograms were also identified as relevant and are currently under development.

**Conclusions:** In December 2020, the GDG began the second round of updating of the European Breast Guidelines. The updating strategy allowed for a structured identification of priority topics where new impactful evidence is available and the introduction of HQs on emerging technologies. In essence, this means these European Guidelines will not expire or become outdated.

**No conflict of interest.**

**97 (PB-097) Poster**

**Screen-detected breast cancers have an improved 5-year recurrence free interval compared to interval and non-screened breast cancers: a population-based study**

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**Background:** Women with screen-detected tumours have an improved overall survival compared to women with interval or non-screened cancers. The development of recurrences in these groups has also been studied, but often in small (hospital based) studies. We aimed to investigate the association between method of detection and risk of recurrence in a nationwide population-based setting.

**Materials and methods:** We selected women between 50 and 76 years from the Netherlands Cancer Registry (NCR) who were diagnosed with primary invasive non-metastatic breast cancer between 2006 and 2008, and who were surgically treated in a Dutch hospital. After linking the NCR to the Netherlands Breast Cancer Screening Program, 3 groups were formed based on method of detection. 1) Screen-detected cancers included cases diagnosed <24 months after a positive screening result, 2) interval cancers were diagnosed <24 months after a negative result. 3) Non-screened cancers included those diagnosed in women at a screening interval beyond the planned 24 months, or never attended screening. Data on local recurrences (LR), regional recurrences (RR) and distant metastasis (DM) were obtained retrospectively from patient files. Primary outcome was 5-year recurrence-free interval (RFI), defined as being free from any recurrence or metastasis within 5 years after diagnosis. Multivariable cox regression analysis was used to compare RFI per method of detection, correcting for age, tumour grade, tumour size, tumour multifocality, hormone receptor subtype (ER+/PR+ and HER2- ER+/PR+ and HER2+, ER- and PR- and HER2- ER- and PR- and HER2+).

**Results:** We included 15 176 patients, of whom 8487 had a screen-detected cancer, 3536 an interval cancer and 3153 a non-screened cancer. Of women with screen-detected cancers, 1.2% developed a LR, 0.4% RR, and 4.4% DM. Of women with interval cancers 1.2% developed a LR, 1.1% RR and 10.4% DM. Women diagnosed with non-screened cancers developed a LR in 2.0%, a RR in 1.2%, and a DM in 10.8%. Five year RFI was 94.1%, 87.3%, and 86.0% for patients with a screen-detected, interval cancer and non-screened cancer, respectively (p < 0.01). Patients with an interval cancer more often developed a recurrence or metastasis (HR 2.23, 95%CI 1.96–2.53) as were patients with a non-screened cancer (HR 2.53, 95%CI 2.22–2.87). After correcting for confounders, these results remained significant with an HR[updated] 1.25 (95%CI 1.09–1.43) for interval cancers and HR[updated] 1.51 (95%CI 1.32–1.73) for non-screened cancers.

**Conclusion:** After adjusting for age and tumour characteristics, women with screen-detected breast cancer showed an improved RFI compared to women with an interval cancer or non-screened cancer. These results suggest that patients with screen-detected breast cancer have a better prognosis.

**No conflict of interest.**

**99 (PB-099) Poster**

**Preoperative MRI in women with newly diagnosed breast cancer: re-excision rates and additional findings**

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**Background:** Preoperative breast magnetic resonance imaging (MRI) is controversial as an adjunct to conventional breast cancer workup. Our objective was to analyse the influence of preoperative breast MRI on re-excision rates in women with breast cancer, to study MRI findings and their impact on surgical management.

**Materials and Methods:** Women with newly diagnosed breast cancer having preoperative MRI and surgery at Vastmanland County Hospital Breast Unit from January–June 2018 (n = 84) were compared with women not undergoing preoperative MRI from January–June 2016 (n = 97). Data were collected from retrospective review of patients’ medical records.

**Results:** The re-excision rate was one of 84 in 2018 and three of 97 in 2016. There was no statistically significant difference in re-excision rates. In the MRI cohort, seven patients had additional malignancy in the ipsilateral and two in the contralateral breast not previously detected by conventional imaging. Findings were more common in women <59 years, and more often resulted in mastectomy.
Conclusions: Preoperative MRI in women with newly diagnosed breast cancer did not reduce the number of re-excisions. Additional malignant findings were more common in women younger than 59 years, influenced surgical management but resulted in no delay of surgery.

No conflict of interest.

100 (PB-100) Poster
Patient-assisted versus standard compression in mammography screening: A randomized trial
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Background: In mammographic screening context, interventions to reduce the discomfort caused by the mammogram are key to improve women’s adherence, whereas assuring the technical quality of the image. This study aims to evaluate the differences in discomfort and technical indicators of patient-assisted versus standard compression modes.

Methods: We conducted a prospective randomized controlled study from September 2017 to December 2019 at the University Hospital del Mar in Barcelona, Spain. All asymptomatic women aged 50 to 69 years who attended mammography screening, and who were able to understand the self-compression procedure, to provide informed consent and to assess the subjective scale of pain, were invited to participate. Both, the laterality, and the compression mode to start with were randomized across all subjects. For assessing discomfort, we used a validated 11-point numeric rating scale, where 0 indicated no pain and 10 indicated the worst pain. We evaluated the patient’s experience with a four items questionnaire. One technical indicator measure per each one of the four mammography views was obtained. The technical indicators were compression force, breast thickness, and average glandular dose. Mann-Whitney U tests were used to test differences of the technical indicators according to the compression mode. Density plots were analyzed.

Results: A total of 448 participants were included. Overall, discomfort score was higher in patient-assisted than standard compression, but it was only significant in right views and showed similar densities. Regarding the patient experience, 63.2% of women agreed or strongly agreed showing their preference in favor of the patient-assisted compression mode. Patient-assisted had a significantly higher compression force than the standard compression. When analyzing density plots, patient-assisted and standard compression had similar breast thickness and average glandular dose. Both variables were significantly lower in patient-assisted compression in cranoocaudal and right views.

Conclusion: The discomfort reported by women during the acquisition of the images seems to have similar distributions among the patient-assisted and the standard compression exams. Responses to experience questionnaire reveal that women might prefer patient-assisted compression instead of standard exams. Overall, technical indicators were similar among both compression modes, except compression force, which was significantly higher in patient-assisted compression.

<table>
<thead>
<tr>
<th>Compression Mode</th>
<th>Patient-assisted (n = 448)</th>
<th>Standard (n = 448)</th>
<th>p-value*</th>
<th>mean (95%CI)</th>
<th>mean (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discomfort score</td>
<td>3.9 (3.7–4.2)</td>
<td>3.7 (3.5–3.9)</td>
<td>0.042</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast thickness (mm)</td>
<td>56.1 (55–57.2)</td>
<td>57.5 (56.4–58.6)</td>
<td>0.015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression Force (N)</td>
<td>99.3 (96.2–102.4)</td>
<td>83.3 (81.7–84.8)</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average glandular dose (mGy)</td>
<td>1.3 (1.3–1.4)</td>
<td>1.4 (1.3–1.4)</td>
<td>0.018</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p-value for Mann–Whitney U test.

Conflict of interest:
Corporate-sponsored Research: The study received funding from General Electric (GE Healthcare, Chicago, IL). Results could benefit founding institution. Nevertheless, the funders had no role in study design, data collection and analysis, decision to publish, or preparation of manuscript.

102 (PB-102) Poster
SAFE: A Microwave Imaging Device for Breast Cancer Early Screening
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Background: SAFE (Scan and Find Early) is a microwave breast cancer imaging (MBI) device with the protentional for non-invasive and non-ionizing breast cancer early screening. The MBI technology utilizes the difference in dielectric properties of cancerous and normal breast tissue. In this study, we assess the ability of the SAFE to accurately detect and classify the existing lesion inside patient’s breast.

Materials and Methods: Only patients scheduled for the biopsy were included in the study. The study was approved by the Ethics committee of Marmara University School of Medicine and in accordance with both institutional and national ethical standards in research and with the World Medical Association Declaration of Helsinki. Machine learning (ML) algorithms, namely Stochastic Gradient Descent (SGD) and AdaBoost, were used to classify the lesions inside patient’s breasts based on the difference in backscattered signals of healthy and lesion affected breasts, while ML Adaptive Boosting (AdaBoost) approach was used to determine the lesion localization. Due to the limited dataset, stratified 5-fold cross-validation was used to assess the proposed models and test their performance. Localization of detected lesions was assessed based on the inverse scattering algorithm.

No conflict of interest.
namely linear sampling method (LSM), used to reconstruct the image of the patient’s breast.

Results: Dataset included 113 patients, 70 with benign and 43 with malignant findings in one of the patient’s breast. The proposed detection model achieved the accuracy of 80.5%, 81.4% and 81%, respectively. Furthermore, proposed classification model had the accuracy of 82.5%, sensitivity at 84.6% and specificity at 81%. Disease correctly localized 83% of the detected lesions.

Conclusion: The study results show that our MBI system is capable to detect, localize and classify breast lesion with malignancy. Further clinical studies are planned to validate acquired results.

No conflict of interest.

103 (PB-103) Poster
Interhospital variations in diagnostic work-up following recall at biennial screening mammography – a population-based study

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Background and aim: Quality control in breast cancer screening itself has been subject of previous studies. Less is known about the work-up after recall, in particular possible interhospital variations regarding work-up. Knowledge about possible differences might aid in further optimizing breast cancer care and is therefore subject of the current study.

Methods: In this retrospective analysis using a prospectively obtained database, we included 17,809 women who experienced a recall in the Dutch national screening program between 2009 and 2018. The diagnostic work-up (e.g. type of additional imaging, frequency and type of biopsy) in seven hospital groups was compared and analyzed using a multivariable logistic regression.

Results: After correction for patient and tumor characteristics, significant differences were found in the diagnostic work-up between the seven hospital groups. Both the number of biopsies and the percentage of problem-solving MRI’s performed were significantly different (smallest OR 0.53 95% CI 0.42–0.66, and smallest OR 0.30; 95% CI 0.18–0.51, respectively). No significant difference was found regarding type of biopsy (percutaneous vs. excision) after adjustment for confounders (smallest OR 0.38 95% CI 0.15–0.97).

Conclusion: The seven hospital groups in our screening region show a significant difference in number of biopsies and percentage of problem-solving MRI’s performed in women recalled at biennial screening mammography. A consistency in work-up between different hospitals might further improve the standard of care for screened women. However, additional research on the effects of these differences is needed to make any definite recommendations.

No conflict of interest.

104 (PB-104) Poster
Comprehensive mutation profiling of PIK3CA gene in Indian breast cancer patients

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Background: Breast cancer (BC) is the most commonly diagnosed cancer and the leading cause of cancer-related death among women worldwide. It is a complex, heterogeneous disease in which several lifestyle-related and genetic factors are implicated in its pathogenesis. The phosphatidylinositol 3-kinase (PI3K) is a complex signaling pathway that plays an essential role in cell growth, proliferation, epithelial to mesenchymal transition, survival, invasion, migration, and apoptosis. It is often altered in BC caused by mutations or amplification of the genes encoding the PI3K catalytic subunit p110α (PIK3CA). However, there is a relative paucity of data on the prevalence and hotspot mutation frequency of PIK3CA in Indian BC patients. Therefore, we investigated the distribution of somatic PIK3CA mutations in Indian BC patients and correlated their associations with clinical features and prognosis.

Material and methods: A total 40 patients with newly diagnosed treatment naïve primary breast cancer were recruited from breast clinics at AIIMS, New Delhi. After surgery, tumour and blood samples were obtained with informed consent, and genomic DNA was extracted. Followed by targeted sequencing of the entire exon of PIK3CA by using illumina platform. Bioinformatics analysis was done by using in house developed script. Further DDPCR (Dropet Digital PCR) was used to validate the hotspot mutation. The QX200 droplet digital PCR system was used according to the manufacturer’s instructions.

Results: By using automated sequencing technology, the PIK3CA genes are shown to be mutated in BC with a somatic mutation rate of 40%. Our studies have discovered mutation at 7 different positions in the catalytic subunit of PIK3CA. Out of these, 5 point mutations (E545K, Q546K, C901F, H1047R, and H1047L) were reported to have higher frequency than others. The substitutions of His with Arg at 1047 shows the highest frequency (20%). DDPCR results endorsed the presence of H1047R in tumor and matched blood samples. In tumor and blood samples, mutant fraction % varies from 0 to 33.36% and 0 to 2.7% respectively.

Conclusion: We demonstrated the first mutation profiling of PIK3CA in BC of the Indian population. We also found a novel nonsynonymous mutation with oncogenic potential along with the reported point mutation. Previous studies elucidate the mechanism of endocrine therapy resistance induced due to H1047R. A higher mutant fraction of H1047R is associated with less likely achieve pathological complete response (pCR). A droplet fraction of H1047R in blood compared to a tumor indicates its low copy number in circulation. Thus H1047R mutation can be used as a predictive pCR and the development of a specific inhibitor against this mutation may be useful in the fight against this breast cancer subtype.

No conflict of interest.

105 (PB-105) Poster
Contrast enhanced mammography in further assessment of screen-detected breast cancer

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Background: Bilateral mammogram and ultrasound is the standard local assessment after diagnosis of early breast cancer. MRI is selectively used but remains controversial. Contrast enhanced mammography (CEM) is reported to have higher sensitivity than mammography, better specificity than ultrasound, and similar performance with better accessibility than MRI. We introduced CEM as near-routine for assessment of patients with screen-detected breast cancer, to identify mammographically occult disease. Here we report imaging biopsy findings for occult disease and impact on surgical decisions.

Material and methods: Women with screen-detected breast cancer underwent CEM as supplementary imaging. CEM findings were documented and radiology of lesions identified by CEM was described. Additional findings were divided into true positives (TP) and false positives (FP). TPs included DCIS or invasive cancer on histopathology, and FPs included any other finding, based on histopathology or imaging.

Results: 208 screen-detected breast cancer patients underwent CEM. 66/208 (32%) had additional findings on CEM; consisting of enhancing mass (38/66), non-mass enhancement (25/66), or both (36/66). 31/66 (47%) were TPs, with 23 invasive cancers and 6 DCIS cases, while 33/66 (50%) were FPs and 2/65 (3%) had neoadjuvant CT and were unclassifiable. FPs consisted of normal breast tissue (16/33), non-proliferative lesions (4/33), atypical proliferative lesions (4/33), and other benign lesions (3/33). Overall, CEM identified 31 (15%) potential or occult malignant lesions in screen-detected breast cancer. TPs were found with lowBIIRADS A/B (15/31, 48%) and high/BIRADS C/D (16/31, 52%) mammographic densities (MD). 30% of patients with lower density breasts had additional abnormalities, compared with 38% patients with higher density breasts; this difference was not statistically significant (p = 0.21). Further, there was no statistically significant difference between the percentage of lower and higher MD patients with an occult malignancy identified on CEM (14% vs 20%, p = 0.25). TPs were identified in younger and older patients (16/71 >60 years old, 15/137 ≤60 years old). CEM resulted in management change in 4/208 (67%) patients, including wider resection (20/208), conversion to mastectomy (10/208), contralateral breast surgery (6/208), additional ipsilateral excision (4/208), bracketing (2/208), and neoadjuvant therapy (2/208). 25/44 patients with management change were TP with occult malignancy, while 18/ 44 patients were FP.
Conclusions: CEM for further assessment in screen-detected breast cancers identified occult malignancy in 15% of patients, with even distribution of TPs over low and high MD and age. This indicates CEM may supplement standard imaging in screen-detected breast cancers. The impact on longer-term outcomes requires further investigation.

No conflict of interest.

106 (PB-106) Poster Prediction of histological grade and molecular subtypes of invasive breast cancer using mammographic growth rate in screening
J. Peters1, N. Moriak023, J. van Dijk1, S. Elias3, D. Lips4, J. Wesseling5, R. Mans6, J. Teunen5, M. Caballo7, M. Broeders8
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Introduction: In breast cancer screening, recall decisions may be optimized if we could determine the aggressiveness of a suspicious lesion. Aggressive invasive breast cancer (IBC) should be detected timely, while overdiagnosis of indolent lesions could be reduced by delaying recall. Molecular subtypes and histological grade of IBC are widely used in prognostication. Growth rate (GR) may be a prognostic marker and can be measured on serial mammograms. We therefore evaluated the discriminative accuracy of mammographic GR to predict molecular subtypes and histological grade of IBC in screening.

Material and methods: In this consecutive cohort study, serial mammograms of 641 women with screen-detected IBC presenting as a unifocal mass were used. Two investigators manually segmented the masses in both mammographic views. A physics-based algorithm was developed to estimate tumour volume (mm³), which was measured on the last, prior and penultimate screening mammogram, when available. GR was calculated based on a power law growth function. Information on estrogen receptor (ER), Her2 receptor and histological grade was obtained from pathology reports. Surrogate molecular subtypes were defined as "luminal-like" (ER+Her2+), "Her2-enriched-like" (ER-Her2+), or "basal-like" (ER-Her2-). Tumour volume at last screening, GR or both were used in logistic regression models to predict whether a tumour was of high grade (III) or not (I or II), or whether a tumour was of a particular molecular subtype. For each model, an internally validated discriminative accuracy was calculated using the mean 10-fold cross-validated area under the curve (AUC), with standard deviations (SD) calculated over 100 repeats.

Results: Preliminary results are shown in Table 1. For each task, a higher predictive accuracy was achieved with GR compared to volume alone. Combining volume and GR did not further improve this performance. The best AUC (AUC 0.72 ± 0.004) was achieved using GR to predict whether a tumour was high grade or not.

Table 1: Mean validation AUCs for the predictive accuracy of volume, GR or both to dichotomize between surrogate molecular subtypes or grade of IBC

<table>
<thead>
<tr>
<th>Grade</th>
<th>Luminal vs. non-luminal</th>
<th>Basal-like vs. other</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0.65 (0.06)</td>
<td>0.63 (0.01)</td>
</tr>
<tr>
<td>II</td>
<td>0.65 (0.06)</td>
<td>0.63 (0.01)</td>
</tr>
<tr>
<td>III</td>
<td>0.65 (0.06)</td>
<td>0.63 (0.01)</td>
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<td>I</td>
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<td>III</td>
<td>0.65 (0.06)</td>
<td>0.63 (0.01)</td>
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</tbody>
</table>

Conclusions: GR can predict molecular subtypes and histological grade of IBC, with moderate discriminative accuracy for prediction of high grade. Using GR improves predictive performance over using volume alone. Interval cancers have yet to be included. To determine the precise value of GR as a prognostic marker to optimize recall decisions, external validation and the study of survival endpoints are of interest.

No conflict of interest.

107 (PB-107) Poster MaThAI: A MultiModal imaging combining Mammography and Thermalytix for better prioritization of mammography scans to detect early malignancies
S.T. Kakakli1, G. Manjunath1, Nirmali Health Analytica Pvt Ltd, Machine Learning Research, Bengaluru, India

Background: Breast cancer screening helps in early intervention and treatment. Post COVID, there is a huge backlog of women who missed their regular screening resulting in increased workload for radiologists, delayed reporting and intervention for malignant women. Thermalytix is an AI-based tool over thermal images that generates a 5 point score called B-Score where 5 is highest suspected risk for breast cancer and 1 is the lowest risk. In this study, we propose and evaluate a multimodal imaging modality called MaThAI that combines mammography and Thermalytix for prioritization of mammography scans using B-Score.

Materials and Methods: Data from two clinical studies were pooled together and a total of 583 women who took both mammography and thermal scans were included in the study. Among them, 72 women were diagnosed to be malignant using mammography, ultrasound, and/or biopsy. Sensitivity and specificity of (i) Mammography alone (as reported by experienced radiologists), (ii) Thermalytix alone (using B-Score ≥ 3 as positive) and (iii) MaThAI (considering a scan as positive if either Mammmogram interpretation or Thermalytix interpretation or both were positive) were computed. As a second experiment, we assessed the benefit of MaThAI prioritization using mammography scans by estimating the reporting times for detecting 95% malignant patients.

Results: The sensitivity and specificity of mammography were 81.9% and 98.8%, respectively, assuming BIRAD 0 as negative. Assuming BIRAD 0 as positive the sensitivity and specificity were 90.3% and 86.9%, respectively. Six malignancies were found in the 67 women with inconclusive reports (BIRADS 0). When Thermalytix-B-Score was considered, the sensitivity and specificity were 94.4% and 81.0%, respectively. MaThAI showed an overall sensitivity and specificity of 98.6% (CI: 95.9%–100%) and 80.6% (CI: 72.2%–84.1%), respectively. The combo modality increased sensitivity over mammography alone by 16.7%, and Thermalytix alone by 4.2%, while decreasing the specificity of mammography by 6.3%.

In the second experiment, we evaluated the benefit of MaThAI in prioritizing mammography scans using Thermalytix B-Score. Assuming mammography B-Score interpretation time is 20 minutes per exam and considering the order of the interpretation to be scan date + time, a single radiologist would have released the reports of 95% of the women with malignancy in 6720 minutes. Whereas using B-Score to reorder the scans for interpreting, the same radiologist would release the reports of 95% of the women with malignancy in 3080 minutes.

Conclusion: MaThAI is a promising multimodal tool for breast screening that enables effective and efficient adjunct usage of thermal image along with mammography. It was effective in increasing the sensitivity of mammography by 16.7% and is estimated to reduce the reporting time for malignant patients by 54%.

Conflict of interest: Ownership: Yes Board of Directors: Yes Corporate-sponsored Research: Yes

POSTER SESSION 16 November 2022

Supportive and Palliative Care Including End of Life Treatment

109 (PB-109) Poster Evaluation and optimization of treatment for patients with metastatic breast cancer and receiving CDK4/6-inhibitors
F. Hanze1, A. Hester1, A. Koeing1, N. Harbeck1, R. Wuerstlein1, 1Breast Center, Department of Gynecology and Obstetrics, CCC Munich and LMU University Hospital, Munich, Germany

Background: Since the European approval of CDK4/6-I, treatment sequences and procedures for patients with HR+ HR+ breast cancer have changed substantially. Compared to intravenous or oral chemotherapy, endocrine-based therapy has different side effects and different diagnostic and therapeutic consequences. Therapy goals are optimal drug efficacy and treatment duration while maintaining maximum independence, adherence and quality of life for patients and conserving resources for medical staff.

Abstracts, EBCC-13 Poster Session
Methods: Time and workload were measured in real time before start and during the first course of therapy. Therapy preferences of medical staff (25 nurses and physicians) and patients (11 treated with endocrine monother-apy, 17 with CDK4/6- and 14 with intravenous chemotherapy) were evaluated, using specified questionnaires.

Results: Most time and workload investments for practitioners occur before patients start with endocrine-based oral therapy; these remains substantial during the first three months of therapy because of managing side effects, dose interruptions, and dose modifications. After the first 3 months of therapy with CDK4/6- i, few side effects occur and contacts between doctors/nurses and patients can be reduced. Compared with intravenous chemotherapy the workload with oral tumor therapy is less after the first three months. All Patients (n=42) clearly prefer oral therapy (100%) compared to other application forms like intravenous (47.6%), subcutaneous (35.7%) or intramuscular (16.7%) injections and visit intervals at the oncology department of 4 weeks (76.2%). Medical staff (25) also prefer oral therapy (100%), followed by subcutaneous (72.0%), intravenous (60%) and intramuscular (36.0%) injections; 96% of them also prefer patient visit intervals of 4 weeks. Regarding medication regimens, medical staff members prefer continuous (100%) compared to 2/17 regimens (40%) while patients do not show significant preferences for any regimen. Patients are likely to accept side effects, e.g., neutropenia, diarrhea, and fatigue up to a severity of CTCAE grade I. Patients would accept an average of 3 [2--5] additional tablets to reduce side effects. From a severity of CTCAE grade II onwards, patients prefer the side effect to be less severe or not exist.

Conclusion: Patients and practitioners prefer oral tumor therapy over other application forms. Time requirements and workload for the medical staff is least before start of endocrine-based therapy and continues in the first three months but substantially reduced over long time treatment. Visit intervals of 4 weeks and well-treated side effects during a long-lasting therapy with CDK4/6-are enable maintained quality of life and high adherence for metastatic breast cancer patients.

Conflict of interest: Advisory Board: F. Henze: Pierre Fabre

Corporate-sponsored Research: A. Hester: Walter-Schultz-Stiftung

Other Substantial Relationships: F. Henze: Lilly, WebMD
A. Hester: Pfizer, Roche
Koenig: Henze
R. Wuerstner: Agenda, Amgen, Aristo, Astra Zeneca, Boeringer Ingelheim, Carl Zeiss, Celgene, Clinisol, Daichi-Sankyo, Eisai, Exact Sciences, Genomic Health, Gilead, Glaxo Smith Kline, Hexal, Lilly, Medstrom Medical, MSD, Mundipharma, Mylan, Nanostim, Novartis, Odonate, Paxman, Palleos, Pfizer, Pierre Fabre, Pome Med, Pumabiotechnology, Riemsier, Roche, Sandoz/Hexal, Sanofi Genzyme, Seattle Genetics (Seagen), Tesaro Bio, Teva, Veracyte, Viatris
N. Harbeck: Amgen, Astra Zeneca, Daichi-Sankyo, Exact Sciences, Gilead, Lilly, MSD, Novartis, Pierre Fabre, Pfizer, Roche, Sandoz, Seagen

111 (PB-111) Poster

Use of immersive virtual reality for management of anxiety and depression among chemotherapy-naive Filipinos breast cancer outpatients in a national university hospital

M. Ando1. 1Perpetual Succour Hospital, Cebu Cancer Institute, Cebu, Philippines

Background: Anxiety and depression have negatively influenced the quality of life among breast cancer patients, potentially interfered with their compliance to treatment, and eventually affected their overall survival. The use of antidepressants has been the standard therapy but may present with several side effects, e.g., drug-to-drug interactions, dependence, and tolerance. As a novel method to address these stressors, virtual reality (VR) utilizes non-invasive simulation digital technology that generates sensory experiences which allows the subjects to interact with the stimuli. This study aimed to determine the effectiveness of immersive VR as an adjunct in the management of treatment-related anxiety and depression among breast cancer outpatients undergoing chemotherapy.

Material and Methods: In this open-label phase II randomized control trial, participants were randomly assigned into two groups during their first cycle of chemotherapy – the intervention group who were subjected to immersive VR experience using VR Box 3D goggle sets plus standard-of-care and the control group who received standard-of-care only. Anxiety and depression scores of at-risk breast cancer patients were measured using the self-reported questionnaire Hospital Anxiety and Depression Scale – Filipinos (HAADS-P) score before and after chemotherapy. The influence of demographic factors on mean differences in HAADS-P scores was explored. Pre- and post-chemotherapy blood pressure, heart rates, and respiratory rates were also determined.

Results: A total of 114 patients were screened and 65.8% (n = 75) of them had HADS-P scores of ≥11. Proportion of patients who were at-risk to develop treatment-related anxiety and depression was 73.5% (n = 50) and 22.1% (n = 15), respectively. 68 patients were subsequently randomized. Statistically, significant mean differences of [−2.71] and [−4.74] in pre-and post-chemotherapy HAADS-P scores between the control group and intervention group were reported (p < 0.05). Changes in mean arterial pressures, heart rates, and respiratory rates pre-and post-chemotherapy were not statistically significant.

Conclusion: Immersive VR could potentially decrease the level of treatment-related anxiety and depression of breast cancer outpatients undergoing chemotherapy.

No conflict of interest.

112 (PB-112) Poster

Designing digital health tools for helping metastatic breast cancer patients manage symptoms at home and optimize quality of life: PRICE and MET-GUIDE

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Background: Patient Reported Outcome Measures (PROMs) are patients’ reports of their symptom experience, quality of life and functionality. These measures are used as an endpoint to clinical trials but rarely integrated into routine cancer care. Moreover, they are resource intensive and prone to retrospective biases. Women with Metastatic Breast Cancer (MBC) face different challenges compared to women with earlier stages of breast cancer and today many of their needs are unmet and not well understood. Therefore, collecting information from this population routinely can allow for ecologically momentary interventions using digital means.

Materials and Methods: We present two digital tools developed to collect PROMs from MBC patients using Ecological Momentary Assessment (EMA) of pain using a mobile application (PRICE) and a website where MBC patients have access to short interventions based on Acceptance and Commitment Therapy (ACT) providing short messages to patients reporting severe pain. Working closely with 51 cancer patients, medical and paramedical personnel, we co-designed an intelligent personalized mobile application to first collect Ecologically Momentary Assessment data on symptoms like pain and fatigue and Health-Related Quality of Life and subsequently enhance symptom management of cancer patients at home.

Results: We will outline the screening process and quantitative analysis we run to identify virtual environments patients would like to receive as a Virtual Reality intervention in the PRICE project and the evidence from focus groups indicating that both tools are acceptable and can support care of MBC patients.

Conclusions: Methods to collect data like EMA can overcome biases and barriers in PROM assessment whilst EMI can offer an easy and possibly cost-effective intervention until patients re-visit the clinic.

No conflict of interest.

113 (PB-113) Poster

Long-term yogic intervention improves the level of TNF-α, IFN-γ, MDA, and NO in breast cancer patients undergoing chemotherapy and/or radiotherapy: A randomized control study

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Background: Breast cancer is the 1st most commonly diagnosed cancer in women and is one of the leading cancers in the world and expected 2.3 million new cases and 0.69 million new deaths in 2022. Inflammation is very well linked to tumor proliferation and metastasis in breast cancer. The yogic
intervention had a positive impact on the patient's quality of life and fatigue. But its association with pro-inflammatory cytokines along with oxidative stress markers in breast cancer has not yet been reported.

Material & methods: We randomized 96 stage II/III breast cancer patients receiving radiotherapy and/or chemotherapy with no other comorbidities. Forty-eight stage II/III breast cancer patients were divided into each group (yoga and control). The yoga group was performing yoga for 5 days/week for 1-year and the control group was not performing the yoga. Serum levels of Tgf-β, IFN-γ, GM-CSF, MDA, NO, SOD and catalase were measured in both the group at baseline, 4th months, 8th months, and 12th months.

Results: In both groups total of 70% of patients were infiltrating ductal carcinoma and the remaining 30% were others. The mean age in the control group was 47.67 ± 1.68 and in the yoga group 43.11 ± 3.98. A total of 42 patients in the yoga and 40 patients in the control group were analyzed for all 4-time points. In the control group, five patients died whereas three were lost in follow-up after 6 months. In the yoga group, two patients died and four were lost in follow-up at different time points. Both groups did not show any significant difference in the level of Hematocrit, TLC, platelets, and total serum bilirubin. Serum IFN-γ and MDA, levels decreased significantly in the yoga group vs the control group at the 8th (p < 0.01) and 12th (p < 0.001) months. Whereas reduction in the TGF-β was observed in both the groups but the difference in the control group was not significant. TGF-β decreases significantly in yoga group vs control at 8th (p < 0.05) and 12th (p < 0.01) months. However, the level of NO was upregulated in the control group but in the yoga group, no change was observed. A significant difference was obtained in the level of NO while comparing the yoga group with the control group at 8th (p < 0.05) and 12th (p < 0.001) months.

Conclusion: The data suggested that long-term yoga intervention is beneficial in reducing the level of TGF-β, IFN-γ, and MDA in breast cancer patients going through treatment. Yoga also helps in maintaining the level of NO. Yoga can be a helpful additional therapy for reducing inflammation and oxidative stress in breast cancer patients undergoing cancer treatments.

No conflict of interest.

114 (PB-114) Poster Exosomes from mistletoe treated tumor cells for the stimulation of immune cells
J. Sahay1, S. E. Combs1, D. Schilling1, M. Gehrmann1. 1Klinikum rechts der Isar, Technische Universität München, Department of Radiation Oncology, München, Germany

Background: Breast carcinoma is the most common and one of the most malignant tumors in women. Multimodal standard therapy currently increases the 5-year survival rate to over 80%. For some years now, complementary medicine has also been playing an increasingly role in the field of cancer therapy. In particular, mistletoe extract is used in breast cancer therapy to reduce the side effects of tumor therapy and to improve patients' quality of life. Different approaches exist to stimulate the immune system. In this in vitro study, the effects of exosomes from mistletoe extract treated tumor cells on the cytotoxic behavior of immune cells were investigated.

Material and Methods: Two human breast cancer cell lines MCF-7 and SK-BR3 were used. Mistletoe extract preparation Viscum album M at a concentration of 10 µg/ml was used to treat tumor cells. After 48 h incubation, exosomes were isolated from the cell culture supernatant of tumor cells. Thereafter, they were used for stimulation of T cell line MOLT4 and NK cell line KHYG-1. Fluorescence-activated cell sorting (FACS) and a cytotoxicity assay (LDH assay) were used to examine the immune cells. The focus was laid on the analysis of surface markers and cytotoxicity of immune cells against tumor cells.

Results: The LDH assays showed significant differences with respect to the cytotoxicity of the immune cells. The NK cell line KHYG-1 showed a significant increase in cytotoxicity after incubation with the exosomes derived from mistletoe extract-treated tumor cells compared to the NK cells that remained untreated (57.9% ± 22.6% vs. 86.8% ± 12.8%). FACS analysis shows significant differences in surface markers CD3 and CD45 on the T cell line after incubation with the exosomes isolated from the tumor cells treated with mistletoe extract.

Conclusion: Based on the results, we conclude that mistletoe extract has a positive effect on the cytotoxicity of immune cells. Thus, there is an assumption of a stimulation effect of the patient’s immune system. It is already proved by clinical studies that mistletoe extract does not exert negative influence on standard therapy procedures nor does it lead to unexpected side effects. Therefore, the use of mistletoe extract could be an integral part of standard therapy in breast cancer patients in the future.

No conflict of interest.

115 (PB-115) Poster Anxiety and depression screening during neoadjuvant chemotherapy treatment in early breast cancer patients: a multicenter longitudinal observational study
J. Rodrigues1, A. Sá2, R. Fontes1, A. Barbosa3, J. Barbosa-Martins3, C. Oliveira4, M. Peixoto1, S. Santos1, J. Rocha1, M. Almeida1, C. Carvalho1, L. Queiroz1, R. Fernandes1, I. Faustino1, C. Portela1, C. Coutinho3, R. Nabiço1. 1Hospital de Braga, Medical Oncology, Braga, Portugal; 2Hospital da Senhora da Oliveira – Guimarães, Medical Oncology, Guimarães, Portugal

Background: Anxiety and depression are common psychiatric disorders in breast cancer patients with an impact on quality of life. While there are many studies addressing psychiatric disorders in metastatic breast cancer patients, few address this problem in early breast cancer treatment.

Methods: This was a multicenter longitudinal observational study that aimed to screen for anxiety and depression with Hospital Anxiety and Depression Scale (HADS) in early breast cancer patients, with no previous known psychiatric disorders, at different time points during neoadjuvant chemotherapy treatment.

Results: A total of 42 female patients with early breast cancer diagnosis were included, with a mean age of 50 years. 52.4% were premenopausal and 92.9% with an ECOG-PS 0. Invasive breast carcinoma of no special type was the most common diagnosis (92.9%). According to HADS score, at baseline screening before chemotherapy, 17 patients had anxiety (40.5%) and seven patients (16.7%) were borderline cases. A reduction in mean anxiety HADS scores was seen when comparing baseline screening (9.55, SD 4.43) to time point one (between cycle 2 and 3 of the first phase of neoadjuvant chemotherapy protocol) (6.81, SD 3.78) and time point two (between cycle 2 and 3 of the second phase of chemotherapy protocol) (7.10, SD 4.35) (p = 0.026, p = 0.022, respectively), reflecting a decline in the number of cases and borderline anxiety cases with time. As for depression, baseline screening, one patient had a score reflecting depression, while eight patients presented as borderline cases. During chemotherapy, the number of depression cases and borderline cases increased from 26.2% at time point one to 33.3% at time point two. Throughout treatment, 28.6% patients started anxiolytic treatment, while 11.9% began antidepressants. Despite a high incidence of anxiety and depression in our study, only four women enrolled psychologist or psychiatrist follow-up during neoadjuvant chemotherapy treatment.

Conclusions: Anxiety is highly prevalent and potentially neglected at the time of breast cancer diagnosis. Depression, on the other hand, seems to be absent in the beginning, but the number of cases increases progressively during neoadjuvant treatment. As psychiatric disorders can impact quality of life, screening at diagnosis and during (neo)adjuvant chemotherapy treatment may allow an early psychologist or psychiatrist intervention.

No conflict of interest.

116 (PB-116) Poster The psycho-emotional condition of the spouses of breast cancer patients
A. Georgiou1, E. Ephiphanious1, P. Liakou2, G. Georgiou3. 1University of Cyprus, Clinical Psychology, Nicosia, Cyprus; 2Metropolitan General, Breast Unit, Athens, Greece; 3Limassol General Hospital, Surgical Department, Limassol, Cyprus

Background: There is substantial evidence that there is an alarming increase in the incidence of breast cancer and therefore, several studies have been undertaken. Many studies were conducted in relation with the psycho-emotional condition of the women with breast cancer. However, the current available and existing research in relation with the care givers of women with breast cancer (i.e., spouses, siblings, friends, dependents) is limited. The aim of the present study is to analyze and evaluate the levels of anxiety, stress, and depression of the spouses of women with breast cancer and the spouses of women without any health issues.

Material and Methods: The sample of the present study consists of 26 spouses of women with breast cancer and of 77 spouses of women without any health issues. We used a qualitative method with standardized questionnaires (DASS-21) for the evaluation of the levels of anxiety, stress, and depression.

Results: The results of our study shows that there is a significant difference in the levels of anxiety, stress and depression among the two groups. The spouses of women with breast cancer have higher levels of anxiety, stress and depression regarding the spouses of women without any health issues.
Conclusions: The outcome of the present research, encourages the further research on the psychosocial condition of the spouses of women with breast cancer. Hopefully new ways can be suggested to help them afford this new situation, be more effective and helpful for their siblings with breast cancer.

No conflict of interest.

POSTER SESSION 17 November 2022

Genetics

117 (PB-030) Poster
Mutation detection rates associated with specific selection criteria for BRCA1/2 testing in 100 high risk families with breast cancer: A single center study
J.S. Lee1, Korean Breast Cancer Foundation. 1Inje University Haeundae Paik Hospital, Surgery, Busan, South Korea

Background: BRCA mutation screening for BrCa/OvCa families is frequently offered on the basis of the fulfillment of selection criteria, thought to be indicative of a genetic predisposition to breast/ovarian cancer (BRCa/OvCa). This study aimed to evaluate, in a single center cohort of BrCa/OvCa families, the mutation detection rate associated with specific clinical features and the relative performance of the employed selection criteria.

Methods: This was a cross-sectional study in 100 healthy individuals with breast cancer family history, including 13 who were referred for BRCA1,2 carrier families. BRCA1/2 mutation screening (cohort 1) and 67 whose family with breast cancer had not previously tested for BRCA1,2 mutations (cohort 2). Sensitivity of mutation detection in BRCA1 and BRCA2 was determined by Next generation sequencing. Fisher exact test was used to compare the detection rates associated with different clinical features. In a subset of families fulfilling only mutually inclusive criteria, odd ratios and 95% confidence interval were estimated to test the relative effectiveness of each criterion.

Results: Among Cohort 1, the DFRs was 53.8% (5 BRCA-1 mutation, 2 BRCA-2 mutation). Additionally, 2 VUS (15.3%) (BRCA-2; c.1909 + 12delT) and 4 negative BRCA mutation was found. Among Cohort 2, only two women (1.74%) was c.390C>A (p.Tyr130), c.5445G>A (p.Trp1815) at BRCA-1. 14 inclusive criteria, odd ratios and 95% confidence interval were estimated to test the relative effectiveness of each criterion.

Table 1: Characteristics of families with breast cancer (n = 100)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cohort 1</th>
<th>Cohort 2</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age(years old), mean ± SD</td>
<td>39.7 ± 5.6</td>
<td>34.6 ± 7.8</td>
<td>0.01</td>
</tr>
<tr>
<td>BRCA 1/2 Mutation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRCA-1 Neg &amp; BRCA-2 Pos</td>
<td>2 (15.3%)</td>
<td>0 (0%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BRCA-1 Pos &amp; BRCA-2 Neg</td>
<td>5 (38.5%)</td>
<td>2 (17.4%)</td>
<td></td>
</tr>
<tr>
<td>BRCA-1 Neg &amp; BRCA-2 VUS</td>
<td>2 (15.3%)</td>
<td>1 (12.6%)</td>
<td></td>
</tr>
<tr>
<td>BRCA-1 VUS &amp; BRCA-2 Neg</td>
<td>0</td>
<td>3 (33.3%)</td>
<td></td>
</tr>
<tr>
<td>Both negative</td>
<td>4 (30.7%)</td>
<td>7 (68.1%)</td>
<td></td>
</tr>
<tr>
<td>Age of breast cancer onset</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤40</td>
<td>7 (36.8%)</td>
<td>16 (13.9%)</td>
<td>0.02</td>
</tr>
<tr>
<td>&gt;45</td>
<td>2 (10.5%)</td>
<td>19 (16.5%)</td>
<td></td>
</tr>
<tr>
<td>≥50</td>
<td>10 (52.6%)</td>
<td>68 (59.1%)</td>
<td></td>
</tr>
<tr>
<td>unknown</td>
<td>0</td>
<td>12 (10.4%)</td>
<td></td>
</tr>
<tr>
<td>Family history of breast cancer in the first or second degree relatives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5 (38.4%)</td>
<td>67 (77.0%)</td>
<td>0.002</td>
</tr>
<tr>
<td>2</td>
<td>6 (46.1%)</td>
<td>13 (14.9%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2 (15.4%)</td>
<td>7 (8.0%)</td>
<td></td>
</tr>
<tr>
<td>Family history of ovary cancer in the first or second degree relatives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No history</td>
<td>118 (84.6%)</td>
<td>85 (97.8%)</td>
<td>0.03</td>
</tr>
<tr>
<td>1</td>
<td>2 (15.4%)</td>
<td>2 (2.2%)</td>
<td></td>
</tr>
<tr>
<td>&gt;50</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Disease history of cancers other than breast cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>10 (8.8%)</td>
<td>8 (9.1%)</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions: Under the employed selection criteria, detection rate of mutation was low (1.74%). Most of family member of breast cancer with unknown BRCA ness was negative under criteria. If BRCA mutation screening for BrCa/OvCa families is necessary, further larger scaled studies for useful criteria should be investigated.

No conflict of interest.
**Background:** Breast cancer accounts for 35–40% of cancer in women in Lebanon and Arab countries with 50% of patients (pts) diagnosed before age 50. Prevalence of pathogenic BRCA variants in high-risk pts is 5.6–20% (Abulkhair and El Saghir 2021). 7 BRCA1 and 7 BRCA2 pathogenic variants were found in 5.6% of 250 pts with high hereditary risk breast cancer using amplicon sequencing and MLPA (El Saghir 2015; Poulet 2016). We report results of Next Generation Sequencing (NGS) on selected cases based on Manchester Score. First report in ethnic Lebanese Arab pts.

**Methods:** Pts prospectively enrolled in 2009–2012. IRB approval secured. Pts signed informed consent. Data collected from medical records. Amplicon and MLPA was done on 250 pts. NGS was done on 100 cases with Manchester Score 14–56. 9 of the 14 pts previously found to have a pathogenic variant (Manchester Score 10–59) were not re-sequenced. NGS on remaining 150 pts was not done due to Covid-19 pandemic and lack of additional funding.

**Results:** NGS showed 7 pathogenic variants, 4 in PALB2 and 3 in ATM. No new BRCA variants were found. Two BRCA2 mutations noted by Amplicon/MLPA reported as VUS in 2015 are reclassified as pathogenic. No new BRCA variants were found. Two BRCA2 mutations noted by Amplicon/MLPA reported as VUS in 2015 are reclassified as pathogenic.

**Conclusions:** Higher risk hereditary breast cancer in pts with MS 10–59 is 20% (23/114), and at least 9.2% in the entire cohort (23/250). Age ≤40 with family history (FH) carries 18.9% risk of harboring a pathogenic mutation while no FH, 1.4% (Table 1).

**Table 1: Risk of carrying a pathogenic variant in 114 high risk pts grouped by age with/without positive FH**

<table>
<thead>
<tr>
<th>Age</th>
<th>FH</th>
<th>No. of pts</th>
<th>BRCA1</th>
<th>BRCA2</th>
<th>ATM</th>
<th>PALB2</th>
<th>BRCA1/2 Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤40</td>
<td>+</td>
<td>74</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>18.9 13.5</td>
</tr>
<tr>
<td>≤40</td>
<td>−</td>
<td>74</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>18.9 13.5</td>
</tr>
<tr>
<td>41–50</td>
<td>+</td>
<td>75</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td>&gt;50</td>
<td>+</td>
<td>27</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>3.7</td>
</tr>
</tbody>
</table>

All BRCA1 pts had triple negative and 7/9 BRCA2 pts had hormone receptor positive breast cancer. 4 unrelated pts shared the same c.1056_1057delGA PALB2 pathogenic variant thus we suggest this is a founder mutation in Lebanese Ethnic Arab population.

**Conclusions:** Mutation rates in high hereditary risk pts with Manchester Score range 10–59 is 20%. Age ≤40 with positive FH can be used to select pts for testing when resources are limited. Our data suggests that c.1056_1057delGA is a PALB2 founder mutation.

**No conflict of interest.**

**121 (PB-034)**

**Poster**

Genome wide association study of long-term patient-reported outcomes following radiotherapy for breast cancer – results from the REQUITE cohort study

**H. Jandré**1, C.D. Vei1, D. Azria1, J. Chang-Clau3, A.M. Dunning1, D. de Ruyschere1, L. Faeh1, S. Gutierrez-Enriquez1, T. Rancati1, B.S. Rosenberg1, M.C. de Santis1, P. Seibold1, E. Sperk1, R.P. Symonds1, A. Vega1, L. Veldeman1, A. Webb1, C. West1, C.J. Talbot1, T. Rancati1.

1University of Leicester, 2Department of Genetics and Genome Biology, Leicester, United Kingdom; 3Centre Jean Perrin, Oncogenetics, Clermont Ferrand, France; 4Universite Clermont Auvergne, Imagerie Moleculaire et Strategies Theranostiques, Clermont Ferrand, France

**Background:** The 10-year survival rate for breast cancer is now approaching 80%. Research has shown that breast cancer survivors increasingly regard long-term quality of life (QoL) as an important treatment outcome. Prior studies suggest that QoL following cancer treatment is in part heritable. Therefore, a genome-wide association study (GWAS) was performed to elucidate common single nucleotide polymorphisms (SNPs) associated with QoL following radiotherapy for breast cancer.

**Methods:** Breast cancer patients (n = 206) were recruited prospectively following breast-conserving surgery (with or without chemotherapy) and prior to radiotherapy across 27 centres in Europe and the US into the multicentre REQUITE cohort study (www.requite.eu) between 2014 and 2016. Longitudinal patient reported outcomes (PROs, EORTC-QLQ-C30 and −B32) were available for 1,919 patients at baseline, following radiotherapy as well as 1 and 2-year follow-up. Patient demographic and treatment predictors of health-related QoL outcome across the six domains of Global Health Status, Fatigue, Pain, Body Image, Arm Symptoms and Breast Symptoms were identified using multivariable linear mixed effects models. All patients were genotyped using Illumina OncoArrays with ~600,000 SNPs. Datasets were imputed according to OncoArray Network methods. A total of 7 097 340 SNPs with minor allele frequency >0.05 and imputation score >0.3 were tested for association with the model residuals for each QoL domain. A linear mixed model approach using the GMMAT software was used in R (R version 4.1.3). The top 15 principal components were used to correct for population stratification and European sub-populations.

**Results:** The rs62260112 SNP was statistically significant with respect to breast symptoms (beta = −5.59, p = 1.41 × 10−9). No other SNP reached the genome wide significant threshold (5 × 10−8) for any QoL domain. Nevertheless, the top reported SNP on chromosome 22 was borderline significant with respect to Global Health Status (rs57543485 with beta = 5.74, p = 5.14 × 10−7). A SNP on chromosome 2 (rs145005002) almost reached significance (beta = −4.67, p = 9.18 × 10−9) with respect to body image. A cluster of SNPs on chromosome 22, particularly rs713705, appeared to be linked with arm symptoms (beta = −8.54 and p = 1.18 × 10−6). In addition, peaks of SNPs on chromosome 16 were observed for pain; the top SNP was rs11542180 with (beta = 7.13, p = 1.26 × 10−6).

**Conclusion:** This largest GWAS to date for patient-reported outcomes up to 2 years following breast radiotherapy provides evidence for genome-wide association of common SNPs with distinct QoL domains. These biologically plausible candidate SNPs can potentially be used to predict health-related QoL after breast cancer treatment.

**No conflict of interest.**

**122 (PB-035)**

**Poster**

Detecting actionable PIK3CA mutations through next-generation sequencing (NGS) in hormone receptor positive (HR+)/HER2-negative advanced/metastatic breast cancer (MBC): a real-life experience

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Background: PIK3CA mutations occur in approximately 40% of patients (pts) affected by HR+/HER2-negative MBC, and are associated with poor prognosis. The SOLAR-1 trial showed that pathogenic PIK3CA mutations are theoretically actionable (ESCAT Tier I) through the kinase inhibitor alpelisib. Nevertheless, in Europe and Italy the administration of alpelisib is allowed by regulatory restrictions only in association with fulvestrant, following progression after endocrine therapy (ET) alone.

Material and methods: From October 2021 to January 2022, somatic NGS analysis assessed on archival FFPE tissue specimens through the FoundationOne® CDx was offered to HR+/HER2-negative MBC pts, with an ECOG PS of 0–1, expected to progress within the following 6 months on ongoing treatments, regardless of histology, number of therapeutic lines undergone, and extension of disease.

Results: To date, fifty-one pts have been enrolled, reporting 7 screening failures due to inadequate histologic material. Pathogenic (class 4 and 5) PIK3CA mutations were detected in 24 pts (54.5%). ES45 K and ES42 K resulted the most frequent mutations. A concurrent CDH1 mutation was reported in 8 (33.3%) pts, while isolated CDH1 mutations were detected in 3 pts (all with lobular or mixed histology). Further potentially actionable alterations (ESCAT Tiers I-II) were documented in 10 pts (20%), including unrecognized HER-2 amplifications and exon-20 mutations, and pathogenic BRCA1/2 mutations. Notably, high TMB (19–43 mut/Mb) was detected in 3 pts, one of which showed MSI. As the majority of pts had undergone ET combined with CDK inhibitors, at the time of NGS profiling only 2 pts were eligible to receive alpelisib; an additional patient received alpelisib through an off-label prescription.

Conclusions: The prevalence of PIK3CA-mutated pts in our cohort was slightly higher than the one reported in the literature and concomitant CDH1 mutations resulted in 1/3 of cases. However, according to current permissions, only a negligible percentage of PIK3CA-mutated pts would be eligible for alpelisib administration. Therefore, we speculate that genomic profiling should be offered as early as possible to MBC pts, in order to improve therapeutic opportunities.

No conflict of interest.

123 (PB-036) Poster
Analysis of rare disruptive germline mutations in 2135 enriched BRCA-negative breast cancer cases excludes additional high-impact susceptibility genes

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Background: To better understand the unexplained ~60% of the genomic architecture of breast cancer susceptibility, we undertook germline whole exome sequencing (WES) of 2,135 BRCA-negative female breast cancer cases. Our series was highly enriched for early-onset, bilateral, family history of disease and concomitant ovarian cancer, substantially boosting power for discovery.

Materials and methods: We leveraged, for comparison, gnomAD WES data from 51 377 ethnicity-matched controls. Parallel variant annotation, quality control, per-site coverage normalisation and GATK QualByDepth calibration, were applied to reduce confounding effects from differences in sequencing and analytic pipelines. Burden testing was performed on damaging variants (protein truncating, damaging missense, and ClinVar pathogenic) at minor allele frequency ≤0.5% for targeted gene sets (known cancer susceptibility genes, DNA repair genes, oncogenes) and exome wide, using Fisher’s exact test and Bonferroni-corrected significance thresholds.

Results: Excluding known breast cancer susceptibility genes, no gene demonstrated significant association with breast cancer in any analysis after correction for multiple testing.

Conclusions: Our study was very well powered to identify additional major high-penetrance breast cancer susceptibility genes. We had 90% power to detect a gene, should one have existed, of PALB2-like effect size (odds ratio = 5) down to a population mutational frequency of 1 in 1475 (less than half that of PALB2). Multiple breast cancer susceptibility genes of extremely low mutational frequency and/or very modest effect (odds ratio <2) are likely to exist, but studies much larger than ours are required to identify them. Our analyses exemplify the challenges of gene discovery for common complex diseases and contextualises the gains in power achieved through using genetically enriched case series and increased sample sizes. In concert with findings from genome-wide association studies, our data support the architecture of residual inherited susceptibility to breast cancer as being highly polygenic, with limited prospect regarding existence of additional genes relevant to clinical testing.

No conflict of interest.

124 (PB-037) Poster
Novel breast cancer predisposing candidate genes identified in Brazilian families with hereditary breast cancer

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Background: It is estimated that 5 to 10% of breast cancer (BC) cases present strong hereditary components. Currently, patients with BC in hereditary breast cancer (HBC) syndrome families are frequently tested for germline mutations in the BRCA1 and BRCA2. However, the pathogenic variants in these genes are identified in only 20% of all HBC cases, 8% of germline mutations are identified in a few other cancer predisposing genes, while most remain without a determined genetic etiology.

Given the significant proportion of HBC cases without a determined genetic etiology, as well as the scarcity of data regarding the genetic predisposition to BC in the Brazilian population, we aim to identify novel BC predisposing genes candidates by performing whole exome sequencing (WES) of families with multiple affected.

Material and methods: As an inclusion criterion, families with at least 3 cases of BC were selected, in which the proband had previously been subjected to sequencing and found negative for pathogenic or likely pathogenic variants in the main predisposing genes associated with HBC. The study cohort is comprised of 30 patients with BC from 8 families and 2 unaffected relatives from the familial branch without BC.

WES was performed with the genomic DNA extracted from the 32 samples of saliva or blood, using the IDT xGen Exome v2 library preparation kit, and the Illumina HiSeq or NovaSeq sequencing platforms. VarSeq software (Golden Helix®) was used to annotate variants and apply filters to the WES data.

Results: We identified 24 variants in 24 novel candidate genes that completely segregate with the BC in one of the 8 families studied. The number of potential candidates is consistent with genetic heterogeneity exhibited by HBC and the prevailing hypothesis that remaining BC cancer predisposing genes yet to be discovered will each likely account for a small proportion of HBC but collectively account for a significant proportion of cases.

Among these, 3 candidate variants identified in 3 different families are interesting, as they have high prediction scores for pathogenic potential, and have been reported in genes in signaling pathways and biological processes already associated with cancer predisposition.

The most promising candidate gene identified participates in the homologous recombination DNA repair pathway, a pathway containing numerous known BC predisposition genes, including the BRCA1 and BRCA2. Two other promising candidate genes are known to participate in important canonical oncogenic pathways, such as the MYC and KRAS.

Conclusions: Our findings contribute to characterizing the genetic background of HBC by presenting novel candidate genes for BC predisposition. The results of this study have great potential for informed clinical management by including novel predisposing genes in genetic tests offered to patients and their families.

No conflict of interest.
Lifestyle, Prevention including Secondary Prevention

126 (PB-039) Poster
A multimodal approach for the management of co-morbid cardiotoxicity in the elderly breast cancer patients


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Background: Evidence-based best practices for risk stratification of elderly breast cancer patients are still lacking. Data for this patient population are scarce since elderly patients are underrepresented in clinical oncology trials. As a result, lower doses of chemotherapy are prescribed due to concerns for cardiotoxicity, frailty and high prevalence of multimorbidity [1]. This contributes to undertreatment and suboptimal outcomes with a negative impact on the patients’ Quality of Life (QoL) [2]. CARDIOCARE project [3] develops a novel and cost-effective risk stratification and healthcare model providing evidence-based best practices and care pathways to improve the management of multimorbidity breast cancer patients at risk for cardiotoxicity.

Material and methods: CARDIOCARE exploits existing retrospective real world data from 5 clinical partners (European Institute of Oncology, Bank of Cyprus Oncology Centre, Karolinska University Hospital, National and Kapodistrian University of Athens and University of Ioannina) of elderly breast cancer patients. In parallel, a multicenter clinical study will be performed collecting data (clinical, imaging, omics, biomarkers, psychomarkers, intrinsic capacity and QoL) through the CARDIOCARE mobile application and digital biomarkers from sensor devices (physical activity sensor, ECG sensor) to be explored by machine learning approaches.

Results: New validated sets of quality Key Performance Indicators (KPIs) will be defined for better managing the elderly multimorbidity breast cancer patient and cardiotoxicity, including biomarker, intrinsic capacity, QoL, satisfaction and cost-effectiveness indicators. Novel integrated eHealth behavioral and psychological interventions will be established for improving the intrinsic capacity and QoL and counteract cardiotoxicity in elderly breast cancer patients and new validated risk stratification models will be developed, incorporating novel biomarkers, psychomarkers for optimal healthcare pathways identification.

Conclusions: CARDIOCARE approaches the challenge of the seamless integration and interoperability of a variety of software components. It creates a scalable big data management and analysis platform of multidimensional health data, sensor signals, and data from the mobile health application aiming to provide actionable insights and assist clinicians to identify best practices to improve QoL, identify patient care gaps, improve patient outreach by automatically tracking and managing a patient’s progress, participation, compliance, preference and satisfaction and support patient-centred care.

No conflict of interest.

References
Studying the pathological complete response (Miller Payne scale) among 5-year breast cancer survivors

Poster

No conflict of interest.

FP does not delay the onset of oncological treatment and our data do not suggest an adverse impact of FP on pathological complete response to NAC.

Results: Compared with those with physical activity of 0 MET-min/week, those with ≥1499 (aHR 0.82, 95% CI 0.69–0.98), 500–999 (aHR 0.75, 95% CI 0.63–0.90), and ≥1000 (aHR 0.76, 95% CI 0.63–0.93) MET-min/week of PA had lower risk of CVD. Higher levels of PA were associated with lower risk of stroke (p for trend = 0.016). The benefits of PA on obese and overweight breast cancer survivors were smaller than those in normal weight survivors. The frequency of moderate-to-vigorous physical activity (MVPA) showed a reverse J-curve association with CVD, and the best benefit occurred in the 3–4 times MVPA per week group (aHR 0.59, 95% CI 0.46–0.74).

Conclusions: The study showed that even small amounts of PA may be beneficial in potentially decreasing the risk of CVD, CHD, and stroke in breast cancer survivors. Our result will be useful to prescribe and deliver exercise among long-term breast cancer survivors.

No conflict of interest.

130 (PB-043) Poster

Early integrated rehabilitation helps maintain good cognitive function in breast cancer patients – a comparison of self-reported cognitive function between the intervention group and control group in a prospective study in 511 patients

Y. H. Oh6, G. Lee7, J. S. Son7, S. M. Park7.

Background: Impaired cognitive function after breast cancer treatment is a health problem that is very difficult to treat. Our aim was to determine whether the early introduction of integrated rehabilitation from the start of the cancer treatment is associated with the prevalence of self-reported cognitive function decline in breast cancer patients.

Material and methods: The subjects of our prospective study were 511 female breast cancer patients (29–65 (mean 52) years of age), who participated in the pilot study on the individualized integrated rehabilitation of breast cancer patients in 2019–2022 and were followed for at least six months. The control group included 214 patients and the intervention group 214 patients. The patients completed three questionnaires (EORTC QLQ - C30, B23 and NCCN) before and six months after the beginning of cancer treatment. The control group obtained the same rehabilitation as was offered to all breast cancer patients in our hospital before the start of our prospective study. The multidisciplinary rehabilitation team reviewed the documentation of all the patients from the intervention group before and six months after the beginning of cancer treatment and recommended appropriate interventions according to the patient’s needs. The integrated rehabilitation coordinator referred patients for additional interventions in compliance with the institute’s clinical pathway (psychologist, general practitioner, nutritional treatment, physical rehabilitation, kinesiologist-guided online exercises, gynecologist, anagelgia, vocational rehabilitation). Data on the patients’ demographics, disease extent, cancer treatment and self-reported cognitive function reported in questionnaires before and six months after starting cancer treatment were collected and analysed using the chi-square, ANOVA and a paired t-test.

Results: There were no differences between the control and the intervention group of patients in terms of age, education, disease extent, surgical procedures, systemic cancer treatment, or radiotherapy. There were no differences between the groups in the prevalence of self-reported cognitive function decline before starting cancer treatment (p = 0.15). Before the cancer treatment, moderate or severe self-reported cognitive function decline were reported in the intervention and control groups in 4% and 6.6%, respectively. However, six months after the beginning of cancer treatment, moderate or severe self-reported cognitive function decline were less common in the intervention group in comparison to the control group (p < 0.001). Moderate or severe self-reported cognitive function decline were less common in the intervention group in comparison to the control group (p < 0.001). Moderate or severe self-reported cognitive function decline were less common in the intervention group in comparison to the control group (p < 0.001).
severe cognitive self-reported function decline were reported in the intervention and control groups in 3.7% and 12.8%, respectively.

Conclusions: Early integrated rehabilitation helps maintain good cognitive function in breast cancer patients six months after starting cancer treatment.

No conflict of interest.

131 (PB-044) Poster
Effect of Covid-19 pandemic on breast cancer disease progression
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Introduction: On 11th March 2020 WHO officially declared Covid-19-infection pandemic. The pandemic challenged the National Health systems worldwide. Most Hospitals were reconfigured, and elective surgeries rescheduled. Breast Cancer management was no different, with the pandemic affecting the screening, presentation, diagnosis and treatment of Breast Cancer. People who have been diagnosed with breast cancer and people who are at high risk for breast cancer found themselves in a uniquely difficult and frightening position since the crisis began.

Different hospitals and trusts adapted different guidelines of managing patient. As much as Beaumont hospital was affected with the crisis the breast department tried its best to continue looking after patients with breast cancer. Clinic numbers were sustained with reduced staff however efforts were put in to assess and manage urgently tried patients. In this paper we aim to conduct a retrospective analysis of locally advanced Breast cancers that presented during pre Covid compared to the pandemic era. The Hypothesis is that during the crisis the number of fungating breast cancer patients presenting to the breast clinic increased.

Methods: This is a retrospective study, which involves TNM Staging of all breast cancers that were presented to the Beaumont Hospital between January 2017 and December 2021. Data was reviewed and clinical staging assigned when possible. Data was performed for each year for following variables.
- Total number of patients seen
- Absolute number of Breast cancers Treated
- Absolute number of TNM stage
- Number of fungating Breast Cancers

Results: Of all the new patients presenting to the breast clinic during the first five years a total of 1952 breast cancers were diagnosed. Of all the new breast cancer diagnosis the percentage of patients diagnosed in every stage did not show a huge difference. On average 36.8% patients were diagnosed per year in stage I between 2017–2019 compared to 40.5% during the pandemic. For stage II the numbers were 32.6% versus 34.5% which also showed a slight increase during the last 2 years. Interestingly stage 3 and stage 4 numbers were slightly high during pre-covid era. On an average 1.4% patients presented as fungating breast wound during the pre-pandemic era versus 3.4% presenting during the Covid 19. On applying two sample Z test of proportion p value (<0.0001) is significant.

Conclusion: The different presentation of breast cancer at various stages remained the same during the pre covid and during the pandemic however the number of locally advanced breast cancers presenting to Beaumont Hospital increased during the pandemic era. Possible explanation could be patients presenting late to try avoiding hospitals. Further research into the various causes will be helpful.

No conflict of interest.

132 (PB-045) Poster
Black seed oil supplement had positive effects on blood concentration and mRNA expression levels of estrogen and SHBG in premenopausal women with overweight and obesity: a crossover, double blind, placebo controlled randomized clinical trial
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Background: Medicinal herbs have been widely used for their anti-obesity effects among women with overweight and obesity. However, evidence showed that using these herbs with various types of phytoestrogens, fatty acids and active components may affect sex hormones and gene expression of parameters related to the prognosis of hormone-related cancers such as BC, especially among obese populations and premenopausal women. One of these medicinal herbs is black seed (BS) which is a major source of kaempferol (a flavonoid phytoestrogen) and fatty acids. This is the first study aimed to assess the effect of BS oil supplements on mRNA expression of ER and SHBG in PBMCs and serum peptide concentrations of free estradiol (E2) and SHBG in premenopausal healthy women with overweight and obesity.

Material and Methods: Participants were randomized to receive either BS supplements (2000 mg/day (n = 23)) or placebo (n = 24). This study took two treatment periods of 8 weeks each, separated by a 4-week washout period. Outcomes were measured four times during the study. A repeated-measure ANOVA model was used considering the effect of treatment, time, and interaction between them, called as the carryover effect. If the carryover effect was found to be significant (p < 0.05), the results of the first intervention period were analyzed using analysis of covariance (ANCOVA). The magnitude of the effects was measured estimating Cohen’s d (δ).

Results: Forty-seven participants were recruited for the study. BS supplementation significantly increased transcription levels of both ER (p = 0.039), and SHBG (p = 0.02), though with medium effect sizes (d = −0.32, d = −0.47, respectively). Although a significant decrease with a medium-high effect size was observed in serum E2 (p < 0.001, d = 0.57), the carryover effect was found to be significant (p < 0.05). However, the results remained unchanged after the analysis based on the first intervention period. An insignificant increase with a medium effect size was observed in serum levels of SHBG (p = 0.052, d = −0.34); it is possible that the duration of the intervention was not long enough to observe the effects.

Conclusions: Overall, despite a significant increase in the expressions of ER, SHBG, and serum SHBG, as well as a significant decrease in serum E2, the effect sizes were found to be medium, which partially supports the hypothesis that daily supplementation with 2000mg/day of BS oil (as a source of phytoestrogens) may lower the risk of BC in premenopausal healthy overweight and obese women. As the role of herbal medicine in BC prognosis is still of major concern, more RCTs with different designs and populations (specifically with various menopausal status and BC history) are necessary to clarify the exact BC preventive efficacy of BS and its actions beyond the estrogen receptors and other potential parameters during long-term exposure.

No conflict of interest.

133 (PB-046) Poster
Breast cancer nutritional risk factors: insights from the Tesco 1.0 dataset

Background: Dietary influences on breast cancer outcomes have previously been underdetermined to quantify, and traditional longitudinal approach to breast cancer is prone to bias, expensive, and fail to quantify changes in habits over time and with co-habitation. The Tesco 1.0 dataset is open-source data from Tesco’s club card loyalty scheme, covering 420 m transactions amongst 16 m club card users resident in one of the 33 boroughs of Greater London. The data is presented as an average ‘item’ purchased in each borough, with 202 individual nutritional components data presented. Our associated group has previously validated this dataset with known cardiovascular risk factors and outcomes (EAPC 2022).

Method: We hypothesised that this dataset might give us meaningful insight into the correlation between population-level food purchasing behaviour and breast cancer outcomes. We performed a univariable Spearman’s Rho on each dietary correlation with ASMR per 100,000 breast cancer mortality (ONS) per London borough. We used a 2-tailed P-value with a high significance level of <0.01. We also explored predicted confounders of borough deprivation, population % ethnicity, and hourly wage.

Results: We found that breast cancer outcomes were highly correlated with dietary purchasing habits, in biologically plausible relationships. Protective factors were consumption of dairy (R = 0.5, P = 0.004) eggs (R = 0.58, P = 0.02), fish (R = 0.52, P = 0.002) and fruit and vegetable intake (R = −0.462). Risk factors were total consumption of sugar (R = 0.542, P = 0.001), carbohydrate (R = 0.551, P = 0.001), ready-made meals (R = 0.599, P = 0), and sweets (R = 0.662, P = 0.001). Prevalence of diabetes (R = 0.32, P = 0.003) and obesity (R = 0.558, P = 0.001) were significant confounders. Interestingly breast cancer outcomes were significantly inversely correlated with population density (R = 0.6 > P = 0) the higher the density, the lower the
breast cancer mortality, suggesting breast cancer is associated with affluence and smaller households.

**Conclusions:** In this exploratory analysis, we have demonstrated biologically plausible relationships, and compared to other cancers, breast cancer is a disease highly related to fat/inflammation/diet axis. Further work to explore the causal relationships and at an individual level is required. This potentially could be ultimately be useful to better advise individuals on risk prevention and improve screening of at-risk populations.

**No conflict of interest.**

135 (PB-048)  
**Poster**  
Finding patient-reported deterrents to adjunct Breast Cancer screening among patients with dense breast tissues. A cross sectional study in Pakistan

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**Background:** Women with dense breast tissues are at a greater risk of developing cancer. For this particular population, we need to incorporate adjunct screening modalities as age, socioeconomic status, personal risk of breast cancer etc associated with patient concerns about preventive screening modalities.

**Methods:** A cross sectional study was conducted from June 2019 to August 2020. The preferences and attitudes of women with dense breasts toward adjunct breast cancer screening were evaluated. Patient survey responses regarding whether various factors would deter patients from adjunct breast cancer screening and regarding which of three hypothetical breast screening examinations they would prefer were extracted from the survey data. Patient demographic and clinical data were obtained by review of patients medical records.

**Results:** Surveys were completed by 700 women (median age, 53.0 years) with dense breasts. Younger age in the sensitivity of mammography of dense breasts was independently associated with lesser concern about adjunct screening examination time (1 divided by adjusted odds ratio [AOR], 0.55 [95% CI, 0.34–0.89]), additional imaging that could result (1/AOR, 0.51 [95% CI, 0.31–0.85]), and greater preference for a more sensitive hypothetical screening examination (1/AOR, 1.85 [95% CI, 1.20–2.86]). Concern about examination cost, the most commonly cited deterrent to adjunct screening (66.9%), was independently associated with younger age (1/AOR, 1.45 [95% CI, 1.01–2.08]) but not with imputed socioeconomic variables or other tested variables. Younger age was also associated with lesser concern about pain (1/AOR, 0.69 [95% CI, 0.48–0.99]), additional imaging that could result (1/AOR, 0.48 [95% CI, 0.31–0.76]), and IV contrast administration (1/AOR, 0.56 [95% CI, 0.37–0.83]).

**Conclusion:** Our study exhibits that patient concerns about adjunct breast cancer screening may be mitigated by educating patients about the limitations of the sensitivity of mammography of dense breasts and by exploring age-specific ways to address the financial impact of adjunct screening.

**No conflict of interest.**

137 (PB-050)  
**Poster**  
Effect of a 24 week home-based walking program on the incidence of aromatase inhibitor induced musculoskeletal pain: The WISE prospective, randomized, multicenter trial [SAKK 95/17]

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**Background:** Aromatase inhibitor (AI) induced arthralgia/myalgia (AIA) is a frequent side-effect of AI-therapy. We investigated the effect of a simple, home-based walking program outdoors, beginning at the start of AI-therapy, on the incidence of AIA, as well as symptom burden and quality of life (QoL) during 24 weeks.

**Material and methods:** 375 patients (pts) with early breast cancer were included. Pts were randomly allocated to intervention (arm A) or control arm (arm B). The statistical considerations were: H0 incidence of pain ≥ 50%; H1 35%; alpha 0.05 (1-sided); power 80%. Stratification accounted for level of pain at baseline: ≥ 3 at 3 time points or if AI therapy was permanently discontinued. Secondary endpoints included fatigue, hot flashes, QoL. Aromatase inhibitor adherence/discontinuation, falling, disease status, and overall survival.

**Results:** 158 pts in arm A and 162 in arm B were eligible for analysis. Median daily number of steps was moderately, yet significantly higher in arm A (8542; B: 7742; p = 0.015). 68% of pts self-reported to have achieved the study goal activity in arm A. Mean “worst pain” remained consistently throughout 2 and 3 measurements in both arms during all time points measured. The incidence of AIA during 24 weeks was high, but was not different between the two arms (A: 58.2%, and B: 56.2%, p = 0.6). No significant association between AIA and PA, independent of the allocation to the trial.
arms, was found (p = 0.3). None of the secondary endpoints was significantly different between the trial arms. Adherence to Al over 24 weeks was high, and only 5% of pts discontinued Al treatment.

**Conclusions:** Median number of daily steps in arm A was higher than in arm B, whereas the number of daily minutes spent doing activity was not. In general, mean AIA was low. Incidence of AIA did not differ between trial arms. Within the whole trial population, no association between the number of daily minutes spent doing activity and AIA was found. Furthermore, none of the secondary endpoints showed any significant differences. In summary, our simple walking program aimed to achieve two thirds of pts in arm A to achieve the defined goal of PA, but failed to reduce the symptom burden as compared to arm B.

**No conflict of interest.**

139 (PB-051) Poster
Cumulative risks of false positive recall and screen detected breast cancer after multiple rounds of screening

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**Background:** Breast cancer screening has been shown to reduce breast-cancer mortality, but is also associated with harms. It is, therefore, important to provide balanced, high-quality information to enable women to make an informed decision about participating. Since most women make a decision about participation and adhere to this decision for future invitations, presenting risks from multiple screening rounds is crucial.

**Materials and methods:** This study included 114 931 women who were invited for their first screening round in 2005. Individual screening data from 2005 to 2018 were gathered via the Netherlands Comprehensive Cancer Organisation on subsequent screening rounds. Survival analyses were used to calculate cumulative risks for a false-positive (FP) and a true positive (TP) result. Also, participation and detection rate were calculated for women with a history of FP results in comparison to women with true negative (TN) results.

**Results:** In total, 92 902 women participated in the first screening round (80.6%). Of the women invited seven times, 63.3% participated in all rounds. Over seven rounds of participation, the cumulative risk of a TP result was 3.7% and the cumulative risk of a FP result was 9.1% (Table 1). In the screening round after a FP result, participation was lower (72–3.7%) compared to a round following a TN result (91–63%). This difference was more pronounced if the FP result was received in the first screening round. Furthermore, in women who had a FP result, the detection rate at subsequent rounds was 59% higher and 66% more interval cancers were found than after a TN screening outcome. Also, women with a history of a FP result had nearly twice as many FP results in later rounds.

**Table 1:** Cumulative results of receiving a FP or TP result during outcome after 1–7 screening rounds

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<thead>
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<th>Cumulative risk</th>
<th>FP</th>
<th>TP</th>
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<tr>
<td>After round 1</td>
<td>2.5</td>
<td>0.7</td>
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<tr>
<td>After round 2</td>
<td>3.9</td>
<td>1.1</td>
</tr>
<tr>
<td>After round 3</td>
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<td>1.5</td>
</tr>
<tr>
<td>After round 4</td>
<td>6.1</td>
<td>2.0</td>
</tr>
<tr>
<td>After round 5</td>
<td>7.3</td>
<td>2.6</td>
</tr>
<tr>
<td>After round 6</td>
<td>8.2</td>
<td>3.2</td>
</tr>
<tr>
<td>After round 7</td>
<td>9.1</td>
<td>3.7</td>
</tr>
</tbody>
</table>

**Conclusions:** Over the course of seven screening rounds in the Dutch breast cancer screening program, women had a 3.7% chance of a screen-detected breast cancer and a 9.1% chance of at least one FP result. The detection rate and the number of new FP results among women with a previous FP was higher than in women with previous TN results, while the participation rate was lower. Information provided to women invited for screening should include cumulative risks and the higher detection in women with a history of FP results.

**No conflict of interest.**

139 (PB-052) Poster
How ‘breast aware’ are the Indian women? A study among the women visiting a tertiary-care, referral and teaching hospital

M.V. Newton1, V.V. Palanivelrajan1, V. St. John’s Medical College, General Surgery, Bengaluru, India

Introduction: ‘Who will educate us’ lamented a School Principal after she took part in our study & education session. There’s palpable low Breast Cancer (BC) literacy with rising incidence and disproportionate mortality rates.

**Methodology:** Breast-Cancer Awareness Measure (B-CAM) developed by Cancer Research UK was administered to 944 women. B-CAM measures Knowledge, age related risk & reported frequency of breast checking & other components. A woman is BC aware if she identified 5 or more non-lump symptoms, age related risk and reported breast checking once a week/month. At the end, each participant was given ‘Be Breast Aware’ education; what/how to look for demonstrated on a model.

**Results:** 2.8% Health Professionals. 3.1% BC survivors. 78.8% had lump & 55.3% had Non-Lump knowledge of BC. 10% had age related risk knowledge. 24.3% check breasts once a week/month. 41.9% aware BC is common after 50 years. 14/944 (1.5%) had BC awareness. 59.9% had breast symptoms but never consulted a doctor. 31.1% embarrassed, 29.5% scared to consult. 43% heard of Breast screening, 34% Mammography, 31.4% Ultrasound, 18.9% both. 44.06% knew family history risk. Those practicing breast checking looked for size change (24.5%), Nipple position (17.4%), discharge (22.2%), pain (32.6%), & lump (24.7%) in standing (17.8%) supine (8.5%) using finger pads (15.8%) finger tips (21.6%), using circular movements (16.4%) & pinching breast tissue (19.6%).

**Conclusion:** Healthcare workers & Breast Cancer survivors lack breast awareness which is alarming, indicates the need for BC awareness and post BC treatment follow-up care education in these two groups and general population. Some practice wrong method (E.g. pinching tissue) of breast checking which may lead to anxiety, unnecessary investigative costs. ‘Be Breast Aware’ education based on NHS 5-point plan given to 944 participants.

**No conflict of interest.**

140 (PB-053) Poster
Contribution and performance of subsidized mammography and breast cancer detection rate in underserved populations of rural and urban areas of Sindh, Pakistan

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**Background:** In Pakistan, breast cancer is an enormous public health concern as its mortality is the highest in any Asian population. It can be effectively detected in its early stage with screening mammography, offered
to all eligible asymptomatic women. However, in Pakistan, there is no organized screening mammography program at the national level & screening practices are very low. That is why advanced-stage presentation is common in our population. It is important to assess the utility of subsidized screening mammography services in the early detection of breast cancer and reducing mortality. This study aimed to assess performance and patient outcomes in the audit of screening mammography from Jan 2019–March 2021.

**Materials and Methods**: The study setting was the mobile mammography unit in Aga Khan and Child Care Centre, Hyderabad. A cross-sectional study was conducted to audit the results of mammography of 1102 women who underwent mammography. All Computed Radiology (CR) screening mammograms performed among all asymptomatic women of 40 years–75 years of age & with no personal history of breast cancer were analyzed. It also included women of less than 40 years of age if of high-risk profile or advised screening by surgeon/health care provider. The patients were followed-up until December 2021.

**Results**: The breast cancer detection rate was 11 cases per 1,000 mammograms which is much higher than that reported by the NMD National Mammography Database (3.43 per 1000) for women. The median age of cancer diagnosis was 55 years (range 29–63 yrs). Ductal carcinoma in situ was found in 3 (25%) and invasive breast cancer in 9 (79%) of cases. 3 (37.5%) had stage 0 and 5 (62.5%) had stages 1 & 2. Minimal cancer (<10 mm) was reported in 5 (41.6%) cases. Positive predictive values PPV1 for abnormal interpretations was 18%, PPV2 for biopsy conducted was 40%, and PPV3 for biopsy performed was 75%. 14 (46.7%) women who were recommended a biopsy, were lost to follow-up. The distribution of BI-RADS was the following: recommended a biopsy, were lost to follow-up. The distribution of BI-RADS was the following:

- Category 0 (65.5%)
- Category 1 (12.5%)
- Category 2 (21%)
- Category 3 (0%)
- Category 4 (12%)

The recall rate was very high (72%).

**Conclusion**: The high cancer detection rate and high recall rate in the study are important findings to draft MMU screening mammography guidelines for Pakistani women. Considering the high CDR, it is important to plan for implementing an organized population-based screening program that can address the issues of cost, remoteness, and dearth of mammogram machines. There is a need for establishing similar MMUs suitable for our women belonging to all socioeconomic statuses. Multicenter research with a larger sample size is needed to confirm the effectiveness and analyze the cost-effectiveness of using an MMU for implementing it in other areas.

**No conflict of interest.**

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**Results**: Correlations between the dimensions ranged from 0.62 (RM-RA) to 0.82 (GF-PF). MF was the hardest to predict (MSE 4.4%), followed by GF (MSE 4.0%). Weight, BMI or waist size were predictors for all five types of fatigue, as well as fatigue at a previous time point and whether someone has used birth control pills. For fatigue at T3, age and alcohol use were also important predictors. The clustering algorithm could determine separate profiles for high and low risk patients. All fatigue dimensions in the patient group followed a similar profile and were highest at T2. Healthy controls showed the same level of fatigue across all dimensions and at all time points.

**Conclusions**: In this study, lifestyle factors predicted the risk of CRF in breast cancer patients who received chemotherapy. Therefore, lifestyle should be included in prediction models to target patients at high risk of CRF. As lifestyle factors are modifiable, more research should be performed towards interventions to target these and the effect on CRF.

**No conflict of interest.**

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**No conflict of interest.**
Background: Since 2017, partial breast irradiation (PBI) is considered standard treatment after breast conserving surgery (BCS) in breast cancer patients with a low risk on recurrence. In order to reduce the irradiated tissue volume, toxicity, and the number of radiotherapy sessions, PBI can be performed preoperatively. In this study, we assessed the clinical and oncological outcomes of preoperative PBI.

Materials and methods: We conducted a systematic review of studies on preoperative PBI followed by BCS in low-risk breast cancer patients using the databases Ovid Medline, Embase.com, Web of Science (Core Collection) and Scopus. References of eligible manuscripts were checked for other relevant articles. The primary endpoint was pathologic complete response (pCR) according to EUSOMA criteria.

Results: A total of 7 prospective and 1 retrospective cohort studies were identified (Table 1). In up to 42% of the patients pCR was found, and the rate was higher after a longer interval between radiotherapy and BCS (range 0.8–8 months). After a maximum median follow-up of 5.8 years, studies on external beam radiotherapy reported low local recurrence rates (0–3%) and overall survival of 97–100%. Acute toxicity consisted mainly of grade 1 skin toxicity (19–34%) and seroma (31%). Late toxicity was predominantly fibrosis grade 1 (46–100%) and grade 2 (10–11%). Cosmetic outcome was rated good to excellent by 78–100% of the patients.

Conclusion: Existing literature on preoperative PBI showed a higher pCR rate after a longer interval between PBI and BCS. Acceptable toxicity, good oncological and cosmetic outcomes were reported. In the ongoing ABLATIVE-2 trial (NCT05350722), pCR will be evaluated 12 months after single-dose preoperative PBI aiming to omit surgery in future low-risk patients with a predicted pCR.

Table 1: Characteristics of the included cohort studies on preoperative partial breast irradiation followed by breast conserving surgery

<table>
<thead>
<tr>
<th>Author, year of publication</th>
<th>Technique</th>
<th>Number of patients</th>
<th>Dose/ fractionation (patients)</th>
<th>Adjuvant systemic therapy (patients)</th>
<th>Follow-up (years)</th>
<th>Time to surgery (months)</th>
<th>Adjuvant chemotherapy (patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weißenfurther et al. 2021</td>
<td>EBRT 19</td>
<td>28.5 Gy/3</td>
<td>-</td>
<td>-</td>
<td>6–8</td>
<td>-</td>
<td>6–8</td>
</tr>
<tr>
<td>Bossa et al. 2019</td>
<td>EBRT 133</td>
<td>40 Gy/10 in 2 weeks</td>
<td>59</td>
<td></td>
<td>5.9</td>
<td>6</td>
<td></td>
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<tr>
<td>PAIRB trial</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Nicholas et al. 2016</td>
<td>EBRT 27</td>
<td>38.5 Gy/10</td>
<td>CT</td>
<td>22</td>
<td>3.6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Tiberi et al. 2020</td>
<td>EBRT 10</td>
<td>20 Gy/1</td>
<td>-</td>
<td>11–13</td>
<td>1.8</td>
<td>(43)</td>
<td></td>
</tr>
<tr>
<td>Indication: PAPBI trial</td>
<td>EBRT 36</td>
<td>20 Gy/1</td>
<td>HT</td>
<td>24 (43)</td>
<td></td>
<td>32 (89)</td>
<td></td>
</tr>
<tr>
<td>Guidolin et al. 2019</td>
<td>EBRT 27</td>
<td>21 Gy/1</td>
<td>-</td>
<td>1.0</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Horton et al. 2015</td>
<td>EBRT 32</td>
<td>15 Gy/1</td>
<td>HT</td>
<td>72</td>
<td>1.9</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Vander/Wilder et al. 2021</td>
<td>IORT 53</td>
<td>15 Gy/1</td>
<td>CT</td>
<td>5.8</td>
<td>8</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Nhan et al. 2013</td>
<td>IORT 57</td>
<td>15 Gy/1</td>
<td>HT</td>
<td>45</td>
<td>8</td>
<td></td>
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</tr>
</tbody>
</table>

EBRT external beam radiotherapy, IORT intraoperative radiotherapy, bid twice a day, CT chemotherapy, HT hormonal therapy. *this study also included patients treated with neoadjuvant hormonal therapy (17%).

No conflict of interest.

146 (PB-059) Poster

Proton beam therapy for early breast cancer: a systematic review and quantitative synthesis of adverse clinical outcomes

F. Holt1, J. Probert1, Z. Liu2, F. Duane3, G. Ntetas4, S. Darby1, D. Dodwell1, C. Coles5, J. Haviland4, A. Kirby1, C. Taylor1,1 Nuffield Department of Population Health, University of Oxford, Oxford, United Kingdom; 2 Trinity College Dublin, St Luke’s Radiation Oncology Network, Dublin, Ireland; 3Department of Oncology, University of Cambridge, Cambridge, United Kingdom; 4Pragmatic Clinical Trials Unit, Queen Mary University of London, London, United Kingdom; 5Breast Cancer Radiotherapy, The Royal Marsden and The Institute of Cancer Research, London, United Kingdom

Background: Proton beam therapy (PBT) is increasingly available to some patients with early breast cancer because it achieves better planned dose distributions than standard photon radiotherapy. But there are uncertainties around how planned PBT dose distributions relate to clinical outcomes. This study quantitatively summarises the adverse clinical outcomes of delivered PBT for early breast cancer.

Methods: A systematic review and quantitative synthesis of clinical outcomes from published studies of adjuvant PBT for early breast cancer 2000–2021 was undertaken. Eligible studies were identified by searching Ovid MEDLINE® and EMBASE®.
Results: Thirty studies (1408 patients) published between 2000 and 2021 reported clinical outcomes after PBT for early breast cancer. 2630 studies (1315 patients) were conducted in the USA. There were no randomised trials. Median follow up ranged from 2–59 months. There were 18 studies (918 patients) of PBT to the whole breast/chest wall z regional lymph nodes and eight studies (358 patients) of PBT to the partial breast. Reconstruction outcomes after PBT to the reconstructed breast z regional lymph nodes were reported in nine studies (332 patients). PBT delivery type varied over time. Scattering PBT was delivered in six studies (230 patients) starting between 2003 and 2012. Uniform or pencil beam scanning PBT was used in 20 studies (1004 patients) starting between 2013 and 2019. Two studies (123 patients) beginning 2011 used both PBT types. For two studies (51 patients) PBT type was unspecified.

In the short term reported adverse outcomes varied by clinical target and PBT type. Severe adverse outcomes after scanning PBT to the whole breast or chest wall z regional lymph nodes were dermatitis (42/715, 6%), infection (1/125, <1%), pain (1/235, <1%), and pneumonitis (1/246, <1%). Severe adverse outcomes after scattering PBT to these targets were dermatitis (11/41, 27%) and infection (3/18, 17%). There were no severe adverse outcomes reported after scanning PBT to the partial breast. After scattering PBT to the partial breast severe dermatitis (7/669, 4%) was reported. Adverse breast reconstruction outcomes after scattering PBT were removal of prosthetic implant (32/152, 21%), capsular contraction (21/153, 14%), infection (19/142, 13%), and revision of prosthetic (22/5, 8%) or autologous (0/3, 0%) reconstruction. One of the four (25%) patients assessed for adverse breast reconstruction outcomes after scattering PBT developed an infection.

Conclusions: In the short-term there were few severe adverse effects from scanning PBT delivered to the whole breast or chest wall z regional lymph nodes or the partial breast. Longer follow up of patients treated with PBT and randomised trials are needed to gain a fuller understanding of the benefits and late adverse effects of PBT.

No conflict of interest.

149 (PB-062)

Poster

Primary results of ANZ 1002 : Post-operative Radiotherapy Omission in Selected Patients with Early breast Cancer Trial (PROSPECT) following pre-operative breast MRI

B. Mann\(^1\), A. Rose\(^2\), J. Hughes\(^3\), A. Skandarajah\(^4\), A. Murugus\(^2\), A. Spillane\(^\text{a}^1\), B. Chua\(^1\), N. Zdenkowski\(^5\), H. Badger\(^6\), H. Braggett\(^6\), V. Gebski\(^6\), R. Eiggins\(^6\), A. Park\(^7\), J. Collins\(^6\), Breast Cancer Trials.

\(^1\)The Royal Melbourne Hospital, Breast Service, Melbourne, Australia; \(^2\)The Royal Melbourne Hospital, Radiology, Parkville, Australia; \(^3\)The Royal Melbourne Hospital, Breast Service, Parkville, Australia; \(^4\)The Royal Melbourne Hospital, Pathology, Parkville, Australia; \(^5\)Mater Hospital, Breast Service, Sydney, Australia; \(^6\)Prince of Wales Hospital, Radiation Oncology, Randwick, Australia; \(^7\)Breast Cancer Trials, Trials, Newcastle, Australia; \(^8\)University of Sydney, Clinical Trials Centre, Sydney, Australia

Background: We aimed to determine if preoperative MRI could identify patients in whom the ipsilateral invasive recurrence (IIR) rate was sufficiently low without RT, such that RT might be safely omitted. Here we report primary analysis, and imaging/biopsy findings for occult lesions.

Methods: PROSPECT is a prospective single-arm study. Criteria for omission of RT included age ≥60, nil/minimal or mild Background Parenchymal Enhancement (BPE) on MRI, unilocal pT1N0 cancer, not Triple Negative, no LVI. Imaging findings on MMG, US and MRI were documented and all biopsies were recorded. Pathology of occult lesions (OLs) identified by MRI was described. The primary outcome was the IIR rate at 5 years of those treated without RT. An IIR rate of 5% or less was considered acceptable. Primary analysis occurred after the 100th patient reached 5 years. Results were compared to those of LUMINA which used the Luminal A phenotype to select similar patients for RT omission.

Results: Between 9/2011 and 5/2019, 443 patients had MRI. BPE was nil/ minimal or mild in 344. MRI detected 194 OLs in 144 (33%) patients. 61 MMG/US malignant OLs - 36 invasive and 25 DCIS - were identified in 48 patients (11% of total cohort). Of 38 ipsilateral malignant OLs in 32 patients (7% of total cohort), 23 were DCIS, 4 were T1a, 7 T1b and 4 T1c. 201 patients were treated on trial without RT. The mean age was 63 years (range: 50 to 84), median tumour size 11 mm, grade 1 (104), grade 2 (86) or grade 3 (11). The rate of IIR at 5 years was 1% (1/101). There were 2 IIRs at 4.6 and 7.7 years follow up, 1 regional recurrence, and 1 patient with both a regional and distant recurrence with 1 breast cancer death. There was 1 contralateral (CL) breast cancer, 1 CL DCIS, 2 other cancer diagnoses and 1 death from other causes. Of 242 patients undergoing MRI but not in the main study, median age was 63, median tumour size. 13 mm. 9 underwent mastectomy (2% of total cohort). Followup is complete for 228. There were 3 IIR, 1 ipsilateral regional recurrence and 3 CL primary with no distant metastases or breast cancer deaths. At least 93/201 (46%) would have been ineligible for LUMINA, and 14/196 (7%) apparently eligible for LUMINA had biopsy proven ipsilateral malignant OLs.

Conclusion: Breast MRI in selected, low risk patients identified occult malignancy in 11% of patients. At a median of 5 years follow up the IIR and other breast cancer events was very low. This suggests that local recurrences may be due to occult breast cancers, and MRI may allow the identification of truly localised cancers for which radiation may be safely omitted. The event rate for the entire cohort was very low, suggesting that identification of occult malignancy in apparently unilocular EBC is beneficial. Confirmatory trials are needed.

No conflict of interest.

150 (PB-063)

Poster

Accelerated Partial Breast Irradiation With Multicatheter Brachytherapy after second conservative-surgery

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\(^1\)Hospital Universitario de Navarra, Radiation Oncology in Breast Cancer and Brachytherapy, Pamplona, Spain; \(^2\)Hospital Universitario de Navarra, Brachytherapy and Prostate Cancer, Pamplona, Spain; \(^3\)Hospital Universitario de Navarra, Brachytherapy, Pamplona, Spain; \(^4\)Hospital Universitario de Navarra, Breast Surgery, Pamplona, Spain; \(^5\)Hospital Universitario de Navarra, Breast Surgery, Pamplona, Spain

Background: To examine 5 and 10-year rates of local control (LC) and overall survival (OS) for breast cancer patients with local relapses after

No conflict of interest.
second conservative surgery and accelerated partial breast irradiation (APBI)1.

**Material and methods:** For the analysis we included local relapses of breast tumours <3 cm after a secondary conservative surgery with negative surgical margins. Two APBI-HDR schemes were used: 32 or 34 or Gy in 8–10 twice-daily fractions over 4–5 days. For statistical analysis, we focused on ipsilateral breast recurrence (IBR), regional recurrence (RR), and distant metastases (DM), progression-free (PFS) and overall survival.

**Results:** The median follow-up was 50 months (1–154 months). 111 patients (p) were accrued from September 2008 to December 2021. Histology: intraductal 29p (26.1%), CDI 63p (56.8%), CLI: 9p (8.1%); Papillar: 5 (4.5%); others 4.5%; 74p had T1 tumours and 4p T2. 82% were oestrogen and/or progesterone receptor positive.

Events: 11 IBR, 4 regional recurrence (RR), and 4 distant metastases (DM). 5 and 10-year IBRS was 90.8 and 80.1%, respectively, 5 and 10-year PFS and OS were 76.7 and 71.2%, and 94.1 and 84.3%, respectively. G3 fibrosis was 8%. Two cases of late mastitis were noticed. For statistical analysis, Kaplan-Meier and Log-rank were used. Main dosimetric results: median of needles used: 10 (4–18), with a median of planes 2 (1–4), median PTV volume (cc): 44.29, median D90 PTV (Gy): 3.70, median V100 PTV (%): 94.42, median CI and HI, 1.64 and 0.30, respectively.

**Data table. Dosimetric results:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needles</td>
<td>10</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Planes</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>PTV volume (cc)</td>
<td>44.29</td>
<td>4.6</td>
<td>158</td>
</tr>
<tr>
<td>D90 PTV (Gy)</td>
<td>3.70</td>
<td>1.8</td>
<td>4.70</td>
</tr>
<tr>
<td>V100 PTV (%)</td>
<td>94.42</td>
<td>65.7</td>
<td>99.68</td>
</tr>
<tr>
<td>V100 implant (%)</td>
<td>72.72</td>
<td>7.2</td>
<td>225.25</td>
</tr>
<tr>
<td>V150 implant (%)</td>
<td>20.25</td>
<td>3.3</td>
<td>72</td>
</tr>
</tbody>
</table>

**Conclusion:** APBI in local relapses of breast cancer show a high local control with acceptable toxicity.

**No conflict of interest.**

151 (PB-064) **Poster**

First results on acute skin toxicity in model-based selected breast cancer patients treated with adjuvant intensity modulated proton therapy

M.G.A. Sattler1, 2, J. Sorné1, 2, J. Jacobs2, R. Louwe2, 1 Erasmus MC, Radiotherapy, Rotterdam, Netherlands; 2 Holland PTC, Radiotherapy, Delft, Netherlands

**Background:** Several studies have reported on acute skin toxicity outcomes in breast cancer (BC) patients treated with proton therapy (PT). However, limited data is available on (1) acute skin toxicity outcomes of mildly hypofractionated intensity modulated PT, and (2) on PT outcomes of model-based selected BC patients. Therefore, the primary objective of this study was to assess the incidence and severity of acute skin toxicity in these BC patients, and (2) secondary objectives were to assess predictive factors and dose-effect relationships. This study is part of an ongoing national multicenter study in collaboration with 2 Dutch Proton Therapy Centers (PTCs) (UMC Groningen PTC and Maastro PT).

**Material and methods:** A consecutive cohort of 155 model-based selected BC patients were treated between May 2019 and September 2021 at the Holland PTC in The Netherlands. Baseline and BC treatment characteristics, PT characteristics, and Doctor Reported Outcome Measures were assessed. Acute skin toxicity in the form of Radiation Dermatitis (RD) was graded according to the Common Terminology Criteria for Adverse Events (CTCAE). RD was prospectively registered at baseline, in the last week of PT, at 2 and 12 weeks after PT. Several clinical and dose-volume histogram (DVH) PT parameters were analyzed as potential predictive factors.

**Results:** In this study, RD grade 0, 1, 2 or 3 was observed in 1 (0.6%), 52 (33.6%), 85 (54.6%), and 17 (11%) of BC patients. There were no grade 4 or grade 5 toxicities. The total administered radiation dose (grade 2; p = 0.027 and grade 3; p = 0.006), the elective radiation dose (grade 3; p = 0.001), a boost irradiation (grade 2; p = 0.015 and grade 3; p = 0.039) and bilateral irradiation (grade 3; p = 0.056) were predictive of moderate-to-severe (grade 2–3 grade 3) acute skin toxicity (univariate multinominal logistic regression analyses with RD grade ≤1 as reference group). No significant clinical predictive factors were found. There was no dose-effect relationship between the radiation dose that was received by the skin and the maximum scored RD grade.

**Conclusions:** The majority of model-based selected BC patients treated with mildly hypofractionated PT developed a mild-to-moderate (grade 1 - grade 2) acute skin toxicity. An ongoing national multicenter study will further assess predictive factors and dose-effect relationships for the most severe grade of acute skin toxicity over time by combining the BC patient cohorts from the 3 Dutch PTCs and this may provide further insight into the identification of high risk patients.

**No conflict of interest.**

152 (PB-065) **Poster**

Late cardiac effects in patients with left breast cancer treated with hypofractionated radiotherapy

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**Background:** Patients treated with breast cancer may develop late effects because of treatment. In this study we analysed late cardiac effects in patients with left sided breast cancer treated with hypofractionated radiotherapy.

**Material and methods:** In this retrospective study from January 1986 to December 2005 patients with left breast cancer were analysed for late cardiac effects. Patients’ information was gathered from the files. Patients who had received hypofractionated radiotherapy for left breast cancer at least 10 years ago were included in this study. Radiotherapy dose was 35–40 Gy 15–16/3 weeks. These patients underwent echocardiography, stress myocardial perfusion scintigraphy (MPS) to look for any (reversible or irreversible) perfusion defect (PD) in the myocardium. PD was classified on the basis of extent and intensity. The extent was defined as not significant, mild, moderate and large if it was <5%, 5–10%, >10–20% and >20%, whereas severity was defined as mild moderate and severe.

**Results:** A total 87 patients underwent stress MPS. Mean age at the time of diagnosis was 42 years (range 28–65). Median follow up was 20 years (range 10–36). PD was observed in 28(33%) patients. PD was not significant, mild and moderate in 5(6%), 25(29%) and 1(1%) patient, respectively. Large PD was not reported in any of the patients. In majorly 30(33%) of patient PD was observed in apex and apical anterior left ventricle myocardium. Basal and inferior myocardium was affected in 1(3%) patient only. PD intensity was mild, mild-to-moderate and moderate in 23(68%), 4(13%) and 4(13%) patients, respectively. PD was reversible, partially reversible, minimal reversible and fixed in 24(29%), 3(10%) 1(3%) and 3(6%) patients, respectively. Left ventricular ejection fraction deterioration was observed in 1(1%) patient only. Coronary event occurred in 1(1%) patient.

**Conclusion:** Left side breast patients treated with radiotherapy; myocardial PD was observed in 1/3rd patients in the area exposed to radiation. Left ventricular functional deterioration was observed in one patient only.

**No conflict of interest.**

153 (PB-066) **Poster**

Radiotherapy in patients receiving anthracyclines: phase 3 SAFE trial (NCT2336806) interim analysis

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**Background:** Several studies have evaluated cardioprotective strategies to prevent myocardial dysfunction in patients receiving cardiotoxic therapies. The SAFE trial (ClinicalTrials.gov identifier: NCT2336806) is a four-arm, randomized, phase 3, double-blind, placebo-controlled study. This is a subgroup analysis focused on the impact of postoperative breast radiation therapy (RT) of the pre-specified interim analysis on the first 174 patients who had completed 1(1) acute assessment at 12-month.

**Material and methods:** Patients were eligible for trial inclusion if they had indication to primary or postoperative systemic therapy using an anthracycline-based regimen. Cardioprotective therapy (bisoprolol, ramipril, or both
drugs, as compared to placebo) was administered for 1 year from the initiation of chemotherapy or until the end of radiation therapy. The primary endpoint was defined as detection of any subclinical impairment (worsening ≥10%) in myocardial function and deformation measured with standard and 3-dimensional (3D) echocardiography, left ventricular ejection fraction (LVEF) and global longitudinal strain (GLS).

Results: At 12-month, 3D-LVEF worsened by 4.4% in placebo arm and 3.0%, 1.9%, 1.3% in ramipril, bisoprolol, ramipril plus bisoprolol arms, respectively (P = 0.005). GLS worsened by 6.0% in placebo arm and 1.5%, 0.6% in ramipril, and bisoprolol arms, respectively; whereas it was unchanged (0.1% improvement) in ramipril plus bisoprolol arm (P < 0.001).

Concerning differences in 3D-LVEF changes from baseline to end of treatment, bisoprolol-containing arms showed significant benefit in patients not receiving RT (P = 0.001), in patients receiving right-sided breast RT (P = 0.0001), and with lesser extent, in patients receiving left-sided RT (P = 0.041). No significant benefit was shown in ramipril-containing arms. Concerning differences in GLS changes from baseline to end of treatment, bisoprolol-containing arms showed significant benefit in patients not receiving RT (P = 0.001) and in patients receiving right-sided breast RT (P = 0.0001), while no benefit was shown in patients receiving left-sided breast RT (P = 0.270).

Ranipril-containing arms showed significant benefit in patients not receiving RT (P = 0.035) and in patients receiving left-sided breast RT (P = 0.14), while benefit was shown in patients receiving left-sided breast RT (P = 0.270). No significant benefit was shown in ramipril-containing arms. Concerning differences in LVEF changes from baseline to end of treatment, bisoprolol-containing arms showed significant benefit in patients not receiving RT (P = 0.001), in patients receiving right-sided breast RT (P = 0.0001) and in patients receiving left-sided breast RT (P = 0.001), while no benefit was shown in patients receiving left-sided breast RT (P = 0.270).

Conclusions: At the interim analysis, cardioprotective pharmacological strategies in breast cancer patients may prevent cardiac dysfunction from radiation therapy but not change the cardiac structure. Bisoprolol-based therapy seems to be more effective than ramipril in preventing cardiac dysfunction from radiation therapy and may be considered as an adjuvant cardiac protection strategy for breast cancer patients receiving radiotherapy. Bisoprolol-containing arms showed significant benefit in patients not receiving RT (P = 0.001) and in patients receiving right-sided breast RT (P = 0.0001), while no benefit was shown in patients receiving left-sided breast RT (P = 0.270).

Materials and Methods: Patients were treated with TARGIT-IORT as PBI modality between 2004 and 2021 in a single institute. Inclusion criteria were consistent with TARGIT-A protocol. Primary outcome was 5-years in breast tumour recurrence (IBTR), secondary analyses were regional and distant recurrence risks, disease-free survival, overall survival and tumour-related survival. Primary and secondary outcomes were estimated with Kaplan-Meier method and the analysis was conducted in all study population and in a subgroup of patients that received exclusive TARGIT-IORT (without the addition of whole breast EBRT). High grade toxicity events were described and scored according to Common Terminology Criteria of Adverse Events scales 4.0.

Results: The study included 828 patients, with a median follow up of 64 months (range:3–203). The majority of patients (59.8%) received only TARGIT-IORT ("exclusive IORT" group), while 40.2% of patients were considered to be candidates for PBI after definitive histopathological report. In the received additional whole breast radiation therapy. 5 years IBTR was 2.4% (95%CI) = 1.4%–3.9%) and 3% (95%CI) = 2.5%–5.6%) in all study population and in "exclusive IORT" cohort respectively. Survival analysis results were reported in Table 1. High grade toxicity (CTCAE Grade 3–4) events were rare (incidence = 0.6%) and consisted in 1 case of skin necrosis, 3 cases of severe fibrosis and 1 radiation induced angiosarcoma.

Table 1: five-years Kaplan-Meier estimates of outcomes measures for all population and for exclusive IORT cohort

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>All study population Kaplan-Meier estimates (95%CI)</th>
<th>Exclusive IORT cohort Kaplan-Meier estimates (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 years local recurrence-free survival</td>
<td>97.6 (96.1–98.6)</td>
<td>97 (94.6–98.3)</td>
</tr>
<tr>
<td>5 years regional recurrence-free survival</td>
<td>98.9 (97.6–99.5)</td>
<td>98.6 (96.6–99.4)</td>
</tr>
<tr>
<td>5 years distant recurrence-free survival</td>
<td>98.1 (96.6–98.9)</td>
<td>98.5 (95.9–99.1)</td>
</tr>
<tr>
<td>5 years recurrence-free survival</td>
<td>95.6 (93.7–97)</td>
<td>95.1 (92.3–96.9)</td>
</tr>
<tr>
<td>5 years overall survival</td>
<td>96.2 (94.4–97.5)</td>
<td>95.8 (93.1–97.4)</td>
</tr>
<tr>
<td>5 years tumour related overall survival</td>
<td>98.5 (97.0–99.2)</td>
<td>98.5 (96.4–99.4)</td>
</tr>
</tbody>
</table>

Conclusion: 5 years local recurrence rate and survival outcomes were consistent with TARGIT A trial results. This "real world" single institute experience confirmed the safety and efficacy of TARGIT-IORT as PBI modality.

No conflict of interest.
The mean number of lymph nodes removed was 2 (0–3% G3. All patients with infiltrating carcinoma had T1 tumors, except one. DCIS (20.8% g1, 25% g2 and 46% g3). One patient presented lymphovascular invasion (73). Infiltrating duct carcinoma was the most frequent histology that received 18 Gy was 33cc (10.78–22 cc) received adjuvant chemotherapy, 5 tamoxifen, and 73 aromatase inhibitors. DHI was 0.71 (0.32–1.1). With a median follow-up of 51 months, none of the patients had grade 4 toxicity. Three patients presented lymphovascular invasion. Regarding the infiltrating tumors, 51% were G1, 32% G2, and 3% G3. All patients with infiltrating carcinoma had T1 tumors, except one. The mean number of lymph nodes removed was 2 (0–3). Treatment was in all cases outpatient. All patients received loco-regional anesthesia. The implant was placed guided by ultrasound and fluoroscopy, under optimal conditions of asepsis and antisepsis. Planning was performed with CT, with Oncentra Brachy and a dose of 18 Gy was administered with an accuracy of ±2 mm.

Results: Between September 2014 and March 2021, a total of 97 patients with localized breast cancer were treated. The mean and median age was 62 years (49–81). 24 patients had intraductal carcinoma (DCIS) and the rest were infiltrating (73). Infiltrating duct carcinoma was the most frequent histology (56%), followed by infiltrating lobular carcinoma (4%). 48% were Luminal A, 15.46% Luminal B and 1% Her2-positive Luminal B, the rest were DCIS (20.8% g1, 25% g2 and 46% g3). One patient presented lymphovascular invasion. Regarding the infiltrating tumors, 51% were G1, 32% G2, and 3% G3. All patients with infiltrating carcinoma had T1 tumors, except one. The mean number of lymph nodes removed was 2 (0–14). Two patients received neoadjuvant chemotherapy, 8 tamoxifen, and 16 aromatase inhibitors. The median volume that received 18 Gy was 33cc (10.78–0.83). The median DHL was 0.71 (0.32–0.83).

Regarding acute toxicity, we found no g ≥3 toxicity. Three patients presented grade 2 pain, and one grade 1.

With a median follow-up of 51 months, none of the patients had g ≥3 toxicity. Four patients presented grade 2 pain, one patient was diagnosed of grade 2 and another of grade 1.

Regarding the cosmetic result, 86.9% presented good/very good, and 9% fair/bad.

Two patients relapsed locally (with DCIS, G3). With our data, local control was 97.4%, disease control 100% and distant control 98.9%, with an overall survival of 96%.

Conclusions: VAPBI at a fraction of 18 Gy is an effective and safe treatment in the short and long term.

No conflict of interest.

158 (PB-071) Poster
Home-monitoring of cancer-related fatigue in breast cancer patients
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Background: There is a growing group of women who experience long-term effects of cancer and its treatment. Cancer-related fatigue (CRF) is the most reported health problem, which can lead to a significant decrease in quality of life. On average, CRF treatments are effective, but not for all patients. Holistic monitoring of fatigue severity and impact of fatigue on quality of life and social participation of the individual patient is needed to find the most beneficial personalized treatment. Therefore, the aims are 1) to determine the relevant domains of the holistic patient profile and 2) to develop a holistic home-monitoring toolkit that allows personal treatment advice for CRF.

Materials and methods: Semi-structured online interviews with fourteen healthcare professionals from different disciplines working with cancer patients and four group interviews with breast cancer patients from four clinical institutions were held. The (group)interviews were coded using a thematic analysis approach (TAA). Next, a funnel approach was used to develop the toolkit, see Table 1.

| 1. Relevant domains based on TAA |
| 2. Literature; methods to assess the content of the relevant domains |
| 3. Assessment of methods using expert judgment |
| 4. Consultation of patient advocates |

Methods: Considered for each of the domains and onboarding were wearables, apps and experiences sampling methods, if validated in Dutch and with breast cancer patients. Where applicable, questions using Likert scales were selected using the highest discrimination parameter value in order to use questions with typically the highest information function. Usability was assessed with a thinking aloud method with ten breast cancer patients.

Results: Following the (group)interviews and TAA, the relevant identified domains were CRF dimensions (physical, cognitive, and emotional), limitations in functioning (social, relational, and work), day pattern (including activity and sleep), and coping style. The toolkit consists of a selection of questions and wearables to assess the health status of the patients, split over onboarding questions which subsequently link to relevant deepening...
domains. Over time, the onboarding will be repeated to take possible changes into account. The toolkit was easy to use by 90% of the patients.

**Conclusion:** A first holistic home-monitoring toolkit for CRF was developed consisting of an onboarding questionnaire which indicate which of the four domains will provide the best information for a personal CRF treatment advice and monitor the health status of patients over time. In the future we aim to integrate the toolkit in a personal health environment to ensure easy access and to enable sharing collected home-monitoring data and treatment advice with relevant healthcare professionals.

**No conflict of interest.**

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**Impact of lymphedema on health-related quality of life in early-stage breast cancer patients treated breast conserving therapy with or without sentinel lymph node biopsy:** 2-year results from the randomized controlled trial BOOG2013–08

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**Background:** The BOOG 2013–08 study examined non-inferiority of omission of the sentinel lymph node biopsy (SLNB) in clinically node negative cT1-2 breast cancer patients treated with breast conserving therapy (NCT02271828). This study explores whether omission of the SLNB results in a significant decrease in axillary morbidity rate and improved health-related QoL (HRQoL) at 6-12- and 24 months post-surgery.

**Material and methods:** The BOOG 2013–08 study enrolled 1736 patients between 2015 and 2022 who were randomized to SLNB or follow-up. A subgroup of 1055 participants were used for analysis.

**Results:** There were no statistical significant differences in patient characteristics or clinical relevant difference in lymphedema- or HRQoL scores at baseline between the groups. Table 1 displays lymphedema- and HRQoL scores. Both treatment groups experienced comparable axillary morbidity scores over time with no significant difference between the groups, with the exception of the domains ‘total’, and ‘physical function’ at 6- and 12 months, and at the domain ‘mobility’ at 12 months, in favour of the group treated without SLNB.

**Conclusion:** The impact of omission of the SLNB on axillary morbidity, and consequently on HRQoL, is less than expected, and does not translate in a statistical or clinical relevant difference. A potential explanation for the similar scores could be found in radiotherapy. Additional radiotherapy data are currently being reviewed to explore this possibility.

**No conflict of interest.**

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**Table (abstract: 159 (PB-072)): Lymphedema- and HRQoL scores**

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>6 months</th>
<th>12 months</th>
<th>24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BCT + SLNB N = 526</td>
<td>BCT + SLNB N = 529</td>
<td>BCT + SLNB N = 526</td>
<td>BCT + SLNB N = 529</td>
</tr>
<tr>
<td>BCT without SLNB N = 526</td>
<td>P value</td>
<td>BCT without SLNB N = 529</td>
<td>P value</td>
<td>BCT without SLNB N = 526</td>
</tr>
<tr>
<td><strong>Lymph- ICF Domain scores</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6%</td>
<td>6%</td>
<td>14%</td>
<td>12%</td>
</tr>
<tr>
<td>Physical function</td>
<td>3%</td>
<td>4%</td>
<td>11%</td>
<td>8%</td>
</tr>
<tr>
<td>Mental function</td>
<td>7%</td>
<td>7%</td>
<td>11%</td>
<td>8%</td>
</tr>
<tr>
<td>Mobility domain</td>
<td>8%</td>
<td>8%</td>
<td>18%</td>
<td>16%</td>
</tr>
<tr>
<td><strong>EORTC QLQ C30 Global Health</strong>*</td>
<td>79.9</td>
<td>79.5</td>
<td>74.0</td>
<td>74.0</td>
</tr>
<tr>
<td><strong>Functioning scales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>91.9</td>
<td>91.1</td>
<td>86.1</td>
<td>86.4</td>
</tr>
<tr>
<td>Emotional</td>
<td>77.3</td>
<td>77.4</td>
<td>79.7</td>
<td>80.4</td>
</tr>
<tr>
<td>Cognitive</td>
<td>88.7</td>
<td>89.1</td>
<td>80.5</td>
<td>81.9</td>
</tr>
<tr>
<td><strong>EORTC BR23 Symptom scales/items</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast symptoms</td>
<td>8.0</td>
<td>8.1</td>
<td>23.6</td>
<td>21.3</td>
</tr>
<tr>
<td>Arm symptoms</td>
<td>5.1</td>
<td>4.9</td>
<td>13.3</td>
<td>11.0</td>
</tr>
</tbody>
</table>

*Higher score indicates more impairments in function, activity limitations and participation restrictions due to arm lymphedema.
**Higher score indicates better functioning.
***Higher score indicates more symptoms.

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**Posters Session**

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substantial role in these side effects. Up to now, less is known about preventing these side effects in cancer survivors. Furthermore, no cancer survivors’ specific cut-off is available, making further research difficult.

**Material and methods:** This cross-sectional study assessed the Injustice Experience Questionnaire (IEQ), Numeric Pain Rating Scale (NPRS), Patient-Specific Complaints (PSC), Multidimensional Fatigue Inventory (MFI), and European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-C30 (EORTC-QLQ-C30) in cancer survivors from the Netherlands. A clinically relevant cut-off score for cancer survivors was identified based on the 75th percentile of the distribution of the total IEQ scores. Univariate and multivariate regression analyses were performed to explore the relationship between personal characteristics (gender, age, type of cancer, treatment type) and cancer-related rehabilitation factors (pain intensity, daily activity, fatigue, health-related quality of life) with perceived injustice in cancer survivors.

**Results:** One hundred twenty-one cancer survivors were included from private physiotherapy practices across the Netherlands. A cut-off of ≥20 on the IEQ was identified for cancer survivors. In the univariate analyses, chemotherapy (B = 3.321 [0.346 to 6.295], p = 0.029) and all rehabilitation factors (i.e., NPRS (B = 0.863 [0.161 to 1.568], p = 0.016), PSC (B = 0.008 to 0.127], p = 0.027), MFI (B = 0.204 [0.124 to 0.284], p < 0.001), and EORTC-QLQ-C30 (−0.167 [−0.252 to −0.083], p = 0.001) were significantly associated with the total IEQ scores. However, no significant indirect associations were found for gender (B = 1.520 [0.008 to 0.127], p = 0.016), or type of cancer (B = 3.982 [−1.226 to 9.190], p = 0.133) with total IEQ scores. The multivariate model included MFI, EORTC-QLQ-C30, NPRS, PSC, type of treatment, age, and cancer type (p < 0.252). Only MFI and age maintained a statistically significant direct association with IEQ, which were respectively B = 0.205 [0.125 to 0.285], p < 0.001 and B = −0.086 [−0.191 to 0.285], p < 0.001.

**Conclusion:** Perceived injustice might be a new cornerstone for cancer survivors. However, its knowledge is scarce and its association with personal characteristics and rehabilitation factors should further be examined through longitudinal studies in a larger population to explore causal relationships.

**No conflict of interest.**

### 161 (PB-074) Poster

**Overview of patient preference sensitive attributes in eHealth interventions for breast cancer-related fatigue**

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**Background:** One of the most disabling long-term effects after breast cancer is cancer-related fatigue (CRF). To prevent CRF from becoming chronic, it is important to start treatment against CRF timely. Fortunately, there are many evidence-based eHealth interventions. However, the effectiveness of these interventions varies per person, depending on patients’ personality and preferences. The goal of this research is to create an overview of eHealth interventions for breast cancer patients with CRF and their attributes, with a focus on preference sensitive attributes. This overview can help in providing a more personalized treatment advice, thereby increasing the effectiveness on the CRF.

**Methods:** With a scoping review, we searched systematically through PubMed, Scopus and Web of Science for eHealth interventions. These eHealth interventions had to 1) be tested in a patient group including breast cancer patients and 2) measure the effect on CRF. Information was extracted on patient preference attributes like duration, intensity, contact with healthcare professionals, peer support, costs, content delivery and study results. Results were synthesized based on different categories of non-pharmacological interventions.

**Results:** We found 43 articles describing 35 interventions. Interventions were divided into five categories: physical activity, mind-body and psychological interventions, a combination of previous or other. Table 1 shows the variation in the attributes duration, intensity, contact with professionals and study results per category. Peer support was included in only seven interventions and in six interventions, information was given on potential costs. Content was delivered in various ways: information was presented on websites and apps as video, audio and text and also as vignettes, quizzes and graphics.

**Conclusion:** We created an overview of eHealth interventions for breast cancer patients with CRF and their (preference sensitive) attributes. There was variation between (categories of) interventions, showing possibilities to personalize an intervention advice. The overview hopefully supports professionals in guiding patients to an intervention that fits their preferences, leading to an improved intervention outcome on CRF and improving the quality of life of patients.

<table>
<thead>
<tr>
<th>Category</th>
<th>Duration</th>
<th>Intensity</th>
<th>Professional involvement</th>
<th>Studies with significant improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity (n = 5)</td>
<td>6 weeks—6 months</td>
<td>Tailored by user - 3 hours/week - 3 sessions/week</td>
<td>4/5</td>
<td>2/5</td>
</tr>
<tr>
<td>Mind-body (n = 7)</td>
<td>4—12 weeks, outlier of 20 weeks</td>
<td>Daily practice of exercises</td>
<td>2/7</td>
<td>4/7</td>
</tr>
<tr>
<td>Psychological (n = 13)</td>
<td>6 weeks—6 months</td>
<td>Weekly usage/at own pace, two exceptions: 4x/week and daily use</td>
<td>6/13</td>
<td>9/13</td>
</tr>
<tr>
<td>Other (n = 2)</td>
<td>6 months</td>
<td>Own pace - daily usage</td>
<td>2/2</td>
<td>1/2</td>
</tr>
<tr>
<td>Combination (n = 8)</td>
<td>8 weeks—6 months</td>
<td>Usage at own pace - once/ twice per week - daily use</td>
<td>5/8</td>
<td>8/8</td>
</tr>
</tbody>
</table>

**No conflict of interest.**

### 162 (PB-075) Poster

**Who is at risk of developing breast cancer-related fatigue – a prediction study**

L. Beenhakker1, K.A.E. Wijlens1, A. Witteveen1, M. Heins2, C. Bode5, S. Siesling6, M.M.R. Vollenbroek-Hutten1,8

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**Background:** Cancer-related fatigue (CRF) is still experienced by 20% of the breast cancer patients ten years after diagnosis. Although there are interventions against CRF, they should be started on time to prevent CRF from becoming chronic. Therefore, it is important to identify patients at risk of developing CRF to subsequently monitor them actively. The goal of this study is to explore the possibility to determine the risk breast cancer patients have for developing CRF.

**Methods:** To assess the risk for CRF, the Dutch Primary Secondary Cancer Care Registry (PSCCR) was used. This registry consists of a part of patient reported outcomes (PSCCR-PROFIEL) and a link between data of General Practitioners (GPs) and the Netherlands Cancer Registry (PSCCR). Both have information on breast cancer patient, tumor and treatment characteristics and late effects. In PSCCR-PROFIEL, 23 input variables for 390 patients were available and the patient reported outcomes included the late effect fatigue (yes/no, n = 254). In PSCCR, 12,813 patients were included and GP visits for fatigue were extracted (n = 2224). Fifty-three input variables were used, including information on complaints before diagnosis. Missing data was imputed using Multiple Imputation by Chained Equations. Risk was predicted using machine learning comparing several models: Random Forest Classifier, Logistic Regression, Gaussian Naive

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Bayes, K-Nearest Neighbors and Multi-Layer Perceptron. For extra comparison, a statistical logistic regression model was developed. A nested 5-fold cross validation was used to optimize hyperparameters. The area under the receiver operator characteristic curve (AUC) was calculated to compare model performances.

**Results:** For PSCCR-PROFIEL, the Logistic Regression machine learning model performed best with an AUC of 0.669 ± 0.040. The statistical logistic regression model did not do better, with an AUC of 0.629 ± 0.040. For PSCCR, the best AUC found was 0.561 ± 0.006, also for the Logistic Regression. However, the Statistical Logistic Regression did about the same with 0.551 ± 0.008 as AUC. The predicted probabilities were plotted and visually compared with the true value. This showed no difference between the predicted and non-fatigued patients.

**Conclusion:** When calculating the risk patients have for CRF, we found relatively low AUCs, meaning that the models have low discriminative abilities. It could be that the variables present in the datasets are not predictive of fatigue and more information is needed (e.g. lifestyle factors). Another reason could be that the binary way fatigue is reported in both datasets is not detailed enough to predict CRF, because CRF is a multidimensional and complex long-term effect. In future studies, lifestyle factors should be included and CRF has to be measured multidimensionally to hopefully better predict the risk an individual has for developing CRF.

No conflict of interest.

163 (PB-076) **Depression, loneliness and apathy in older breast cancer survivors: five-year follow-up from the Climb Every Mountain study**


**Background:** Previous studies have shown a relatively high prevalence of psychological disorders in breast cancer survivors. However, there is a lack of information for the increasing older population. Besides, most studies focus on a period shortly after the diagnosis and treatment. However, for the majority of patients the processing and acceptance of their diagnosis and disease begins when the treatment of their cancer is finished and the follow-up begins. Therefore, the aim of the current study was to assess depressive symptoms, loneliness and apathy in older patients with breast cancer within the first five years after diagnosis.

**Material and methods:** Women aged 70 years and older who had been diagnosed with early-stage breast cancer were included from the prospective, multicentre Climb Every Mountain cohort study. Linear mixed models were used to assess longitudinal changes of depression (according to the 15-item Geriatric Depression Scale), loneliness (according to the De Jong Gierveld Loneliness Scale) and apathy (using the Starkstein Apathy Scale) over time at 3, 9, 15, 27 and 60 months follow-up.

**Results:** In total, 299 patients were included. At 3 months follow-up, shortly after the acute treatment, 12% of patients had significant depressive symptoms, while apathy was present in 23% and almost a third of all patients experienced loneliness at that point. Depression, apathy and loneliness scores showed no clinically significant change over time. However, patients who were classified as frail at baseline developed more depressive symptoms than patients who were not frail within the first five years after diagnosis.

**Conclusions:** Depressive symptoms, apathy and loneliness are relatively rare among older breast cancer survivors. However, patients who are frail at baseline are more prone to developing depressive symptoms within the first 5 years after diagnosis, leading to a reduced quality of life.

No conflict of interest.

164 (PB-077) **Exploring timely perspectives of embodiment in women diagnosed with breast cancer undergoing oncoplastic breast surgery: A qualitative study from a plastic and breast surgical outpatient clinic**

S. Thestrup Hansen1, L. Willomees Ramussen2, Zealand University Hospital/University of Southern Denmark, Department of Plastic and Breast Surgery, Roskilde, Denmark; 2Zealand University Hospital, Department of Plastic and Breast Surgery, Roskilde, Denmark

**Background:** Women diagnosed with breast cancer in Western countries are increasingly offered oncoplastic breast surgery as part of breast cancer treatment. As the number of breast cancer survivors grows due to development in surgical and medical treatment, long-term outcomes and the experiences of individuals are required for life-related to satisfaction and body image, have become increasingly important components of breast cancer treatment and rehabilitation. Previous research indicates that women who undergo breast reconstruction after breast cancer treatment report the highest long-term satisfaction with their breasts. This could indicate that reconstruction should be recommended for all women diagnosed with breast cancer. However, the standardizing tendencies of evidence-based practice can override individual deviations, cultural wishes, preferences and rights. Therefore, women’s bodily experiences might be a more multifaceted and individual phenomenon than modest satisfaction outcomes. This study aimed to investigate women’s experiences of oncoplastic breast surgery and how cancer treatment affect their body image over time.

**Material and Methods:** The study was guided by a qualitative descriptive approach and thematic analysis inspired by Braun and Clarke. Fourteen in-depth interviews with seven women diagnosed with breast cancer were conducted from August 2018 to March 2019. In this qualitative study, data analysis was inductively performed parallel with data construction as a process aimed at making sense of data. We framed the discussion of the findings within a theory of embodiment inspired by Merleau-Ponty coherent with the construct of exploring human experiences to generate meaningful knowledge for applied practice.

**Results:** The analysis resulted in two overall themes: “Treatment is required for life-threatening cancer,” and “Striving for a new normal body.” Common to the themes were patients feelings of being on a pendulum reflecting on who they were in the past, their current rationale and transitioning their life ahead from the breast cancer with a changed body.

**Conclusions:** The participants in the study expressed broad levels of satisfaction with the results of the oncoplastic breast surgery. Participants particular valued that the constructed breast had weight and volume even if it was no longer a natural breast.

An implication for future practice is that nurses and physicians caring for women with breast cancer who are candidates for oncoplastic breast surgery need to provide person-centered care and information. That being throughout the breast cancer treatment process, from diagnosis to surgery, to medical treatment and into recovery, to engage with women’s lived experiences of embodiment and body image and to recognize the importance of these experiences in women’s transitions.

No conflict of interest.

165 (PB-078) **Evaluation of fertility preservation in young breast cancer patients**

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**Background:** Cancer treatment can be gonadotoxic and reduce significantly reproductive potential of young women. Oncofertility has emerged as a very important field in oncology which allows cancer survivors to have biological children and maintain their quality of life.

The aim of this study was to evaluate fertility issues and attitude towards fertility preservation in young breast cancer patients.

**Material and methods:** A survey regarding fertility issues and concerns was conducted from 1st of January to 10th of May 2019. Among breast cancer survivors aged 40 years or younger treated at University Hospital for Tumors in Zagreb, Croatia.

**Results:** Our research included 52 patients with a mean age of 36 years. At the time of diagnosis 85% of patients were informed about cancer treatment impact on fertility and potential premature ovarian insufficiency, 75% were informed about available fertility preservation options, 55%
already had children, 85% had a partner and 62.5% expressed maternal desire. A total of 42.5% of patients were interested in fertility preservation. GnRH analogues prior to chemotherapy were given in 52% of patients, 35% of patients underwent reproductive specialist consultation, 22.5% had their embryo/oocyte cryopreserved. The main reason to undergo cryopreservation was a desire for future children before breast cancer diagnosis. Among those who did not consult reproductive specialist main reasons were lack of desire to have children in future (48%), unawareness of fertility preservation options (20%), fear of treatment delay (20%) and fear that pregnancy would cause disease recurrence (16%). Majority of patients (73%) reported satisfaction with their decision regarding fertility preservation. 27.5% expressed actually planning future pregnancy, while 25% were uncertain regarding future pregnancy. Half of the patients were not informed about potential timing of future pregnancy.  

Conclusions: According to our results, more efforts should be put in providing adequate information on all aspects of fertility-related issues and multidisciplinary management of young breast cancer patients.  

No conflict of interest.  

Impact of breast cancer treatment on women’s body image and self esteem  

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Introduction: Diagnosis and treatment of breast cancer affects women mentally and physically. Typically, breast cancer has significant physical changes due to both the cancer itself as well as the corresponding treatment such as surgical intervention, radiotherapy, chemotherapy. These changes influence negatively the body image and self esteem among patients, adding a supplemental burden to psychological distress. The aim of this study was to assess the body image and self esteem among breast cancer treated patients.  

Methods: A cross-sectional survey was conducted during the year 2021 among women treated for breast cancer in the maternity ward of Sousse during the period from January 1, 2013 to December 31, 2017. In order to avoid the acute phase of the disease, patients were surveyed at a time distance of between 24 and 60 months from their cancer diagnosis.  

Data was collected using the QLQ-BR23 validated questionnaire.  

Results: Overall, 100 patients were included in the study with a mean age of 52 ± 8 year [23–73]. All patients had surgical treatment, 80% of which was radical (Patey) and 20% conservative treatment. Overall, 98% of patients had Chemotherapy, 99% radiotherapy and 70% hormonal therapy. Among the women who had a radical treatment, 2 were left by their partners after the treatment.  

Body image and self esteem issues were experienced by a substantial proportion of women in the early months of treatment. Body image was altered among 81% of patients associated with mastectomy, hair loss from chemotherapy, concern with weight gain or loss, poorer mental health and sexual difficulties. The mean body image score was 63 ± 23.8 with a minimum of 0 and a maximum of 91.7. More than half of the patients had a score below 25. The increase in body image score was significantly associated with age (p = 0.00), type of treatment (p = 0.00), marital status (p = 0.001) and the feeling of support (p = 0.01). The elevation of the score was not significantly correlated with the feeling of discrimination (p = 0.6).  

Conclusion: Difficulties related to body image and self esteem were common among breast cancer treated patients. Addressing these problems is essential to improve the quality of life of these women.  

No conflict of interest.  

Impact of breast cancer diagnosis on women’s sexuality  

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Introduction: Breast cancer remains the most frequently diagnosed cancer among in Tunisia representing 20–25% of malignant tumors in women with an incidence in 2017 estimated at 50,171,000 000 cases. Early diagnosis and treatment improves vital prognosis and survival rates on the depend of aesthetic prognosis. The impact of breast cancer on body image should not be underestimated. Physical changes due to oncological therapy are an important issue in long-term breast cancer survivors with a high incidence of sexual dysfunction.  

The aim of this study was to evaluate the impact of breast cancer treatment on self esteem and sexual functioning among Tunisian women.  

Methods: A cross-sectional survey was conducted during the year 2021 among women treated for breast cancer in the maternity ward of Sousse during the period from January 1, 2013 to December 31, 2017. In order to avoid the acute phase of the disease, patients were surveyed at a time distance of between 24 and 60 months from their cancer diagnosis.  

Data was collected using the QLQ-BR23 validated questionnaire.  

Results: Overall, 100 patients were included in the study with a mean age of 52 ± 8 year [23–73]. All patients had surgical treatment, 80% of which was radical (Patey) and 20% conservative treatment. Overall, 98% of patients had Chemotherapy, 99% radiotherapy and 70% hormonal therapy. Among the women who had a radical treatment, 2 were left by their partners after the treatment.  

No conflict of interest.  

The mediating effect of pain catastrophizing and perceived injustice in the relationship of pain on health-related quality of life in breast cancer survivors  

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Background: The importance of cognitive appraisals in the effectiveness of pain coping is well established. Two key variables in these appraisal processes are pain catastrophizing (PC) and perceived injustice (PI), which are known to increase the risk of long-term disability and to aggravate pain-related distress through maladaptive behavioral responses. However, to date, the mediating effect of these appraisals has not been examined concurrently in the breast cancer survivor (BCS) population, nor have they been related to health-related quality of life (HRQoL).  

Material and methods: One hundred ten BCS were recruited by convenience sampling in the Oncology Center of the University Hospital of Brussels for this cross-sectional study. Measurements included the European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire, Pain Catastrophizing Scale, and the Injustice Experienced Questionnaire. Additionally, the Visual Analogue Scale, Douleur Neuropathique 4 Questionnaire, and Central Sensitization Inventory were used as pain outcome measures. The path analysis focused on evaluating the mediating effects of PC and PI in the relationship of pain on the HRQoL in breast cancer survivors.  

Results: Results demonstrated a significant direct effect of pain and PI on HRQoL combined with a significant indirect effect through PI, but not through PC. An increase in pain is suggested to result in a decrease in quality of life. On the other hand, an increase in pain also is suggested to increase the PI. A similar relation with PC was not retained as significant.  

Conclusion: The relative salience of PI as a mediator of HRQoL underscores the fact that PI is not only understudied but also under-appreciated and undertreated in the BCS population. The results of our study warrant replication across longitudinal studies but continue to expand upon the evidence of the multifactorial nature of pain coping in BCS.
Introduction: Quality of life (QOL) of women with breast cancer is known to be affected by the disease itself and treatment. This study was conducted to assess post-treatment QOL in women with breast cancer in Sri Lanka.

Methods: QOL was assessed among a randomly selected sample of 221 women with breast cancer undergoing follow-up at Apeksha Hospital, Maharagama, Sri Lanka. QOL was assessed using validated European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30 and QLQ-BR23 questionnaires.

Results: The mean age of the sample was 57.6 years (SD = 11.5) with a mean follow-up duration of 31.5 months (SD = 18.6).

Mean global health score was 62.6 (SD = 23.4). Mean scores (greater scores indicating better functioning) of physical functions, role function, emotional function, cognitive function, and social function were 70.7, 75.1, 79.8, 82.3 and 80.0, respectively. Mean scores for body image, sexual functioning, sexual enjoyment, and future perspective assessed in QLQ-BR-23 were 82.2, 14.8, 19.3 and 75.5 respectively.

Mean symptom scores (greater scores for being more symptomatic) for fatigue, nausea and vomiting, pain, dyspnea, insomnia, appetite loss, constipation, diarrhoea, and financial difficulties were 32.9, 10.1, 33.9, 13.4, 27.9, 22.6, 16.9, 5.6 and 33.0, respectively. Side effects, breast symptoms, arm symptoms and upset by hair loss assessed in QLQ-BR-23 were 223, 16.7, 27.3 and 24.4, respectively.

No significant association was noted between functional or symptom scores with the type of surgery (i.e., mastectomy vs. breast conservation) in QLQ-C30 or QLQ-BR23 (p > 0.05) when Chi-square test was applied.

Conclusions: Global health status and functional scores of many domains assessed satisfactory showing good general QOL. Substantially poor QOL was observed in areas of sexual functioning and sexual enjoyment.

Symptom scales showed moderate to low scores. Fatigue, pain, insomnia and arm symptoms were among the most disturbing symptoms. Financial difficulties were a major contribution to the poor QOL. Supportive therapy is necessary support to improve their mental health and quality of life.

No conflict of interest.

Conclusion: Stress levels are comparatively higher than depression and anxiety among the selected population. The results show the importance of understanding the psycho-oncological well-being of these patients. By understanding their mental well-being and risk factors, we can provide the necessary support to improve their mental health and quality of life.

No conflict of interest.
Developing an effective self-management web-based intervention using co-designed patient and multidisciplinary research: ePainQ

Background: Breast cancer is the most common cancer in terms of newly diagnosed cases. Surgery is the mainstay of treatment but confers comorbidities including high rates of persistent post-surgical pain. The James Lind Alliance breast surgery priority setting partnership (2022) identified the need to support patients around the time of diagnosis, during and after treatment, asking what are the best methods to individualise information and support given to patients. Web-based interventions providing real-time symptom reporting support patients and clinicians to make early and effective decisions regarding care.

This describes the process of co-design and evaluation of a web-based intervention to meet this need and improve the care experience.

Material and methods: A multi-disciplinary, co-design approach was used to develop a web-based intervention (ePainQ) for the management of post-surgical pain in breast cancer. Stakeholder needs were elicited using mixed methodology including audit, service mapping, scoping and systematic reviews, focus groups and interviews. Needs were identified by patients, healthcare professionals (HCPs) including surgeons, oncologists, nurses, pharmacists, anaesthetists, GPs and academics. The findings were used to develop ePainQ which was tested for acceptability, usability and perceived usefulness in a prospective feasibility study.

Results: The scoping review identified a need to better understand efficacy and content of web-based interventions to underpin such systems into clinical settings. The service evaluation suggested shortened length of surgical inpatient stays have contributed to poor education and support, requiring the need for novel interventions. The systematic review provided tentative evidence of efficacy of WBIs in surgery but that further evidence was required.

Stakeholders contributed significantly to the design and content of ePainQ. Patients perceived the lack of advice limited their ability to self-manage effectively, ePainQ comprised a website and symptom reporting questionnaire which generated individualised advice. Results were linked to patient electronic records in real time.

The feasibility study recruited 69 patients and established ePainQ as acceptable, used and liked by those interacting with it. Patient and HCPs perceptions were that ePainQ plugged the gap that currently exists. All criteria for progression to a phase III RCT to test effectiveness were met.

Conclusion: Effective pain and symptom management involves complex decision making about medication and non-pharmacological methods, which requires excellent HCP-patient communication. Web-based interventions could provide this support with patient-centred development ensuring balanced advice with motivation to self-manage. ePainQ was able to impart reliable, timely information and individualised advice to improve symptom self-management.

No conflict of interest.

Impact of musical training in breast cancer patients with post-treatment cognitive, functional and emotional sequelae

Background: Cognitive deterioration due to the oncological process is one of the most limiting sequelae in breast cancer patients.

The objective of this study was to evaluate an intervention based on music training to reduce cognitive, functional and emotional sequelae in treated patients with no active disease.

Material and methods: Prospective clinical trial, awarded by a Spanish public research institution, carried out by a multidisciplinary team (cognitive stimulation with musical training with a piano and computer support).

Participants were considered for the study regarding: MoCA test, Principal informant test, serologies (HIV, LUES), vitamin B12, folic acid and TSH and cancer in remission. All patients signed informed consent.

We evaluated each patient three times (before, during and after the study) with validated neuropsychological tests.

Results: 19 patients were recruited (median age 46.5, 33–57), 15 patients with breast cancer diagnoses (controlled disease and with no active treatment, only hormono therapy was allowed). All patients were treated with surgery. 9 patients with cheimotherapy (8 Adriamicincyclofosfamide (AC) paclitaxel, one patient with AC + carboplatin-abraxane) and 13 with hormone therapy. All patients received radiotherapy.

We found favorably statistically significant differences with respect to the median scores of the Beck depression questionnaire, the informant’s test, MoCA-30 and modified IDDD.

In the cognitive evaluation, improvements were observed in the inverse digits test, categorical evocation, RALVT, delayed RALVT, Stroop, C:) and TMT B.

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Beck’s depression questionnaire
9 19.75 8 0.012

Adapted
95 9 56 48 0.004

Inferencia
22.5 17.75 18 0.157

MFE-30
64 40.5 22 47 0.012

Modified IDDD
36 26.25 34 2 0.008

Direct digits
6 1.5 7 2 0.207

Indirect digits
4 2 6 1 0.002

Categorical evocation/animals
23 6.75 27 4 0.059

Categorical evocation/p
27.5 15.5 41 16 0.009

Mediane y simbolos
33 11 41 13 0.013

RALVT auditory
41 22 55 22 0.005

Delayed verbal memory
8.5 3.5 13 5 0.011

Stroop P
94.5 21 104 43 0.028

Stroop C
62 13.5 69 16.5 0.009

Stroop P C
39.5 23.5 47 18.5 0.013

Inferencia
4.29 11.97 7.53 26.03 0.182

TMT A (seconds)
26 15.5 23 4 0.23

TMT B (seconds)
58.8 43.75 45 28 0.019

Conclusions: Implementing a method based on musical training with piano in breast cancer patients reduces emotional and functional sequelae, in addition to reducing deficit in cognitive functions such as attention or working memory.

No conflict of interest.

Digital health applications to support patients with breast cancer: Effects of two tailored, dialogue-based programs on quality of life

Background: Breast cancer patients often experience low quality of life (QoL) during and after cancer treatment, which may influence disease progression and survival. Behavioural interventions, such as cognitive behavioural therapy (CBT), could potentially help improve QoL, but they are not always available or offered to these patients. Internet-based behavioural

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Beck’s Anxiety Questionnaire
22.5 17.75 18 0.157

MoCA
36 26.25 34 2 0.008

Direct digits
6 1.5 7 2 0.207

Indirect digits
4 2 6 1 0.002

Categorical evocation/animals
23 6.75 27 4 0.059

Categorical evocation/p
27.5 15.5 41 16 0.009

Mediane y simbolos
33 11 41 13 0.013

RALVT auditory
41 22 55 22 0.005

Delayed verbal memory
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94.5 21 104 43 0.028

Stroop C
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Stroop P C
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Inferencia
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TMT A (seconds)
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TMT B (seconds)
58.8 43.75 45 28 0.019

Conclusions: Implementing a method based on musical training with piano in breast cancer patients reduces emotional and functional sequelae, in addition to reducing deficit in cognitive functions such as attention or working memory.

No conflict of interest.
interventions could bridge such treatment gaps. In this set of studies, we investigated the effects of two novel CBT-based digital interventions ("optimune" and "lancivis"). Both of these digital interventions can be accessed via the Internet and engage patients in individually tailored "dialogues," in which personally relevant CBT techniques are conveyed.

**Material and methods:** The effect of optimune was investigated in a two-arm, parallel-groups, pragmatic randomized controlled trial (RCT), and lancivis was examined in a single-arm pre-post naturalistic study.

The optimune RCT included 363 female breast cancer survivors (age 30–70), who had completed the active treatment phase. Participants were randomly assigned to (1) an intervention group (n = 181), in which they received care as usual (CAU) plus 12-month access to optimune immediately after randomization, or (2) a control group (n = 182), in which they received CAU and optimune after a delay of 3 months. Primary endpoints were QoL (measured with the World Health Organization Quality of Life Questionnaire [WHOQOL-BREF]), physical activity, and dietary habits at 3 months.

The lancivis study included 176 patients with a broad range of confirmed cancer diagnoses (55.11% breast cancer, age >18) and reduced QoL, assessed by Functional Assessment of Cancer Therapy - General questionnaire (FACT-G), total score ≤81. Participants received access to lancivis, and online assessments were conducted at baseline and 3 months.

**Results:** For the optimune RCT, the intention-to-treat (ITT) analyses revealed significant effects on QoL (d = 0.27) and dietary habits (d = 0.36), the effect on physical exercise was not significant; and for the lancivis study, a statistically significant relevant pre-post improvement in QoL was observed (d = 0.47). A clinically relevant improvement was achieved by 42.6% of the patients.

**Conclusions:** These results suggest the effectiveness of 2 digital therapy programs optimune and lancivis in facilitating improvements in QoL (and for optimune, also in dietary habits) in breast cancer patients. An RCT on the effects of lancivis is currently underway, given these promising findings from the single-arm naturalistic study. Efforts to disseminate these CBT-based digital interventions more broadly may be warranted.

No conflict of interest.

175 (PB-088) Poster
Capsaicin patch 179 mg (CP) for the management of localized neuropathic pain (LNP) after breast cancer (BC) treatment

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**Background:** Pain is one of the most frequent symptoms in patients with cancer, and it entails a great impact on their quality of life. It can be due to the disease itself or iatrogenic. In patients with BC, it is multifactorial, mainly influenced by surgery, radiotherapy (RT) and its complications. Neuropathic pain is still a challenge for specialists, and shows a poor response to usual analgesics.

**Material and methods:** Retrospective, observational study of patients with BC and NLP treated with CP in a tertiary hospital. All patients completed the DN4 and LANSS questionnaires for the diagnosis of NLD and were seen by a specialized nurse in a room with appropriate ventilation, for the application of treatment after they gave informed consent.

A direct indication of the skin and a correct mapping of the affected territory (pressure, puncture, temperature...) were carried out. Subsequently, nurses placed the patch covering the delimited area, with a margin of 1 cm. After an hour, the patch was removed, cleaning the area with a gel (2 minutes), soap and water. Follow-up was done by telephone.

**Results:** Between August 2020 and July 2022, 35 patients with BC and DNL were treated. Median age was 54 years (32–85). 11 patients received neoadjuvant chemotherapy (CT), 9 adjuvant CT and 25 hormonal therapy, 26 were treated with lumpectomy, 2 mastectomy, 4 with oncological surgery, and 3 with mastectomy and reconstruction.

Regarding auxiliary treatment, 6 underwent lymphadenectomy and 26 sentinel lymph node biopsy. Seven had postoperative complications (hematoma/seroma).

Prior to treatment with RT, 18 presented pain at the level of the breast/axilla. 16 patients took analgesic medication for other causes/diseases. Nine patients received partial irradiation, the rest, whole breast irradiation, 40 Gy in 15 fractions (fx).

The median time between the placement of the CP and the end of the RT was 27 months (4–70). 21 of the patients had erythema/burning sensation, no more than 24 hours after placement. 5 did not complete the hour due to a burning sensation (15–50 minutes).

29 of the patients showed great improvement and 2 patients did not improve (and refused a second application). 4 patients required a second application at 3 months.

Of the 21 patients who have required only 1 application, the median time without requiring a new patch is 11 months (1–29). The mean VAS before the first application was 8 (5–9), achieving a median decrease of up to 2 (0–4).

**Conclusions:** Treatment of NLD in BC patients with CP is safe, effective, and long-lasting in most cases.

Conflict of interest:
Other Substantive Relationships: They have paid me an the registration to another congress (Spanish Society for Radiation Oncology, SEOR).

**POSTER SESSION 17 November 2022 Systemic Treatment**

176 (PB-089) Poster
Quality of life in postmenopausal breast cancer patients with localized disease who finish endocrine treatment: a prospective study

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**Objective:** In the present study we assess Quality of Life of postmenopausal breast cancer patients who finish endocrine treatment. More Quality of Life information after endocrine therapy cessation is needed.

We examine Quality of Life in patients who had received endocrine therapy for five years. Quality of Life changes after endocrine therapy cessation, and the differences between the two endocrine therapy modalities.

**Methods:** Participating in the study were 158 postmenopausal patients who had received Tamoxifen or Aromatase Inhibitor (AI) for five years. In some cases, endocrine therapy may have changed during these five years. Patients completed the EORTC QLQ-C30 and QLQ-BR45 questionnaires three times over one year of follow-up. Patients ≥65 years also completed the QLQ-ELD14.

Linear mixed effect models were used to evaluate longitudinal changes in Quality of Life and differences in Quality of Life between endocrine therapy modalities.

**Results:** Quality of Life scores for the whole sample throughout follow-up were high (>80/100 points) in most Quality of Life areas. Moderate limitations (>30 points) occurred in the QLQ-BR45 in sexual functioning and enjoyment, future perspective, and joint symptoms. Moderate limitations also occurred in the QLQ-ELD14 in worries about others, maintaining purpose, joint stiffness, future worries, and family support. In those who finished endocrine therapy, pain was reduced during the follow-up period in both groups. Tamoxifen patients showed better Quality of Life in seven functioning, symptoms and emotional areas.

**Conclusions:** Our results show that postmenopausal early-stage breast cancer patients adapted well to their disease and endocrine therapy treatment. Improvements in the follow-up period appeared in one key area, i.e. pain. Differences between endocrine therapy modalities favoured Tamoxifen.

No conflict of interest.

177 (PB-090) Poster
Residual Risk of Relapse: a Systematic Review and a Consensus Project on Unmet needs for HER2-positive non Metastatic Breast Cancer Patients

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Methods: The TOTAM study performed therapeutic drug monitoring in women using adjuvant tamoxifen (trial register: NL5918). Patients needed to have steady-state endoxifen levels (≥3 months of therapy) to be included. The effect of halving the tamoxifen dose was investigated in patients with endoxifen levels ≥32 nM (i.e. 2 × 16 nM, the assumed efficacy threshold) who 1. experienced bothersome side effects and 2. scored ≥52 points on the endocrine subscale (ES) of the Functional Assessment of Cancer Therapy questionnaire (FACT-ES). The effect of dose-reduction on side effects was assessed after 3 months. We strived to improve the ES with >0.5 SD (at least 4 points with an estimated baseline SD of 7–8 points; i.e. clinical relevant improvement) in more than 50% of dose-reduced patients. To test this hypothesis tamoxifen dose had to be reduced in ≥13 patients (1-sided α = 0.05, β = 0.2). Endoxifen levels were determined before and after dose-reduction. As secondary endpoints the individual differences in health-related quality of life (HR-QOL) scores measured with FACT-ES were determined and compared with >0.5 of definite SD and the within-group ES and HR-QOL differences before and after dose-reduction were determined using paired sample T-test or Wilcoxon signed rank tests. To check for a time effect, analyses were repeated in the group with side effects who remained on 20 mg tamoxifen at 3 months and 6 months of tamoxifen.

Results: Twenty patients with bothersome side effects and endoxifen levels ≥32 nM were reduced in tamoxifen dose whereof 17 were evaluable for side effect analysis. The ES improved with ≥6 points (≥definite 0.5 SD) in 41% (90% CI 21–65%, p = 0.038) of the patients. HR-QOL improved with ≥6 points (≥0.5 SD) in 65% (90% CI 42–83%) of the patients. There was a significant and clinically relevant improvement in ES (5.7, mean, 95% CI 0.5–11.5) and HR-QOL (8.2, mean, 95% CI 0.9–15.4) after dose-reduction. These changes were not seen in the patients who were not dose-reduced (N = 59). In 4 out of 19 patients in whom endoxifen levels were measured after dose-reduction endoxifen dropped slightly below the conservative threshold of 16 nM (12.8, 15.5, 15.8, 15.9 nM).

Conclusions: We demonstrated that dose-reduction in case of bothersome tamoxifen-related side effects can improve endocrine symptoms in almost half of patients and strongly increase HR-QOL in two-thirds of these patients. Endoxifen remained above or around threshold in the majority of patients.

Conflict of interest: Advisory Board: RM takes place in advisory boards of Servier. Corporate-sponsored Research: RM has contracted research with Astellas, Bayer, Boehringer-Ingelheim, Cristal Therapeutics, Novartis, Pamgene, Pfizer, Roche and Servier. Other Substantive Relationships: LB is currently an employee of Eli Lilly and Company. All declarations of interest are outside the submitted work.

180 (PB-093) Poster Imaging findings for response evaluation of ductal carcinoma in situ in breast cancer patients treated with neoadjuvant systemic therapy: a systematic review and meta-analysis

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Background: In approximately 45% of invasive breast cancer (IBC) patients treated with neoadjuvant systemic therapy (NST), a ductal carcinoma in situ (DCIS) component is present. Recent studies suggest response of DCIS to NST. The purpose of this study was to provide a systematic review and meta-analysis of the current evidence on imaging findings on mammography, breast MRI and contrast-enhanced mammography (CEM) for response evaluation of DCIS. In addition, the effect of pathological complete response (pCR) definition on diagnostic performance was investigated.

Methods and results: A systematic review and meta-analysis were conducted for imaging modality to calculate pooled sensitivity and specificity for mammography, breast MRI and contrast-enhanced mammography (CEM). A meta-analysis was conducted per imaging modality to calculate pooled sensitivity and specificity for detecting residual disease between pCR definition no residual invasive disease (ypT0/is) and no residual invasive or in situ disease (ypT0).

Results: Thirty studies were included. Eleven mammography studies show that calcifications are related to DCIS, but can persist on post-NST mammography despite complete response of DCIS. In 19 breast MRI studies, which lead to 17 residual DCIS showed enhancement. A meta-analysis of 16 breast MRI studies confirmed higher pooled sensitivity (0.86 versus 0.82) and lower pooled specificity (0.61 versus 0.68) for detection of residual disease when DCIS is considered pCR (ypT0/is). The 2 included
CEM studies suggest the potential benefit of simultaneous evaluation of calcifications and a lesion enhancement to detect real DCIS.

Conclusions: Current imaging findings are insufficiently accurate for response evaluation of DCIS to NST. The definition of PCR affects diagnostic performance of breast MRI.

No conflict of interest.

181 (PB-094) Poster
Concordance between manual pathologist scoring and an Artificial Intelligence Deep Learning-based algorithm for Ki-67 immunohistochemical scoring in breast cancer
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Background: Ki-67 is an established prognostic marker in estrogen receptor (ER)+ breast cancer (BC). Different cut-offs for Ki-67 positivity have been proposed including the 20% cut-off for the FDA approved adjuvant abemaciclib. Manual assessment of Ki-67 immunohistochemistry (IHC) is, however, challenging and time-consuming limiting its implementation in routine practice especially in view of the pathology workforce shortage. Accurate automated systems for Ki-67 scoring are therefore urgently required. Artificial intelligence (AI) is a promising tool for fast integrated Ki-67 analysis. Validation and comparison with pathologists’ scoring, as the gold standard, are needed prior to implementation.

Methods: In a retrospective design, sections from 86 primary BC cases diagnosed at a large UK tertiary referral hospital were stained with Ki-67 MIB1 monoclonal antibody as per the standard diagnostic protocol. Two pathologists, including a specialist breast pathologist, manually evaluated Ki-67 IHC staining by global eyeballing and hotspot assessment following the International Ki67 in Breast Cancer Working Group guidelines. The same slides were assessed using a Visiopharm automated scoring with a deep learning-based Ki-67, BC, AI APP, research use only (Visiopharm, Denmark), which outputs global and hotspot proliferation indexes in an automated approach without manual input. We compared the manual and automated scoring methods using the continuous output score with Spearman correlation analysis and assessed the agreement between both methods with the clinically relevant cut-offs of 14% and 20%.

Results: Patients’ age ranged from 28–86 years with a mean of 60.6 years. Most carcinomas (n = 46, 70%) were of ductal no special type, grade 2 (n = 38, 57.5%) and ER+ (n = 53, 80.3%). An excellent correlation was observed between the Ki-67 AI APP and pathologist manual scores, when comparing both the global (r = 0.95, p < 0.0001) and hotspot scores (r = 0.95, p < 0.0001). For the global score, the Ki-67 AI APP generally scored lower than the pathologist, whereas the hotspot scores were similar.

For the global score, accuracy for the 14% cut-off was 0.93 (sensitivity = 0.91; specificity = 0.97) and for the 20% cut-off the accuracy was 0.88 (sensitivity = 0.82; specificity = 0.94). For the hotspot score, accuracy for the 14% cut-off was 0.84 (sensitivity = 0.92; specificity = 0.65) and for the 20% cut-off the accuracy was 0.91 (sensitivity = 0.96; specificity = 0.81).

Conclusions: The study shows a reassuring strong correlation between an AI-based fully automated algorithm and pathologists’ scoring of Ki-67 IHC sections of BC. No data from the site was used for the development of the APP and therefore the cohort served as an external test set. Testing of the APP in a hospital setting is currently underway to confirm its value and impact on Ki-67 reporting turnaround times.

Conflict of interest:
Other Substantive Relationships: This is a collaborative work between a UK academic institution and Visiopharm, Denmark testing a deep learning-based Ki-67, breast cancer, AI APP currently for research use only.

182 (PB-095) Poster
Genomic signature to guide adjuvant chemotherapy treatment decisions for early breast cancer patients in France: a cost-effectiveness analysis
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Background: The indication for adjuvant chemotherapy (CT) in ER+/HER2-negative (HER2-neg) early breast cancer (BC) remains controversial. Oncotype Dx® (ODx) is a genomic signature developed and validated as a predictive tool of adjuvant CT benefits in these patients. No economic evaluation of this signature was recently conducted in France.

The aim of this study was to assess the cost-effectiveness of ODx compared to standard of care (SoC; clinico-pathological risk appraisal only), in French women with early ER+/HER2-neg BC at high risk of distant recurrence using the most recent data.

Material and methods: We developed a cost-effectiveness model based on the French context estimating costs and health outcomes accumulated over a lifetime horizon with both strategies.

The study population consisted of women with ER+/HER2-neg early BC, node-negative (N0) stratified by age (<50 years and ≥50 years, 41.2%, 16.7%, respectively) and node-positive with 1 to 3 invaded nodes (N1) aged 50 years or older (42.1%). We derived the population distribution from French administrative data.

The model was designed with a decision-tree followed by a five health states Markov structure: recurrence-free, distant recurrence, acute myocardial infarction (AMI), chronic heart failure (CHF) and death. Probabilities were derived from TAILORx and RnPONDER studies, respectively for N0 and N1 patients.

We conducted our analysis from a collective perspective and discounted future costs and health outcomes at a rate of 2.5% for the first 30 years of the time horizon, then at 1.5%, as recommended by the French health technology assessment body.

The perspective included direct medical costs, transportation, and CT related sick leave costs. Costs were valued in 2022 from the French real-life study OPTISOINS for the first year following surgery and the most recent open data from the French national health insurance.

Model outcomes included differences in costs and quality-adjusted life years (QALYs), and incremental cost-effectiveness ratios (ICERs). Uncertainty was assessed with deterministic sensitivity analysis and scenario analyses were carried out using Claiy registry data.

Results: With 55.2% CT avoided, ODx was associated with lower costs than SoC (~3,524) and higher QALYs (~0.34 QALYs). Therefore, looking at ICER, ODx was dominant. Additionally, ODx would decrease the number of patients with AML and CHF by 54.9% and 11.7% respectively. Sensitivity analyses confirmed the results.

Conclusions: In French practice, ODx was shown to be a dominant strategy compared to SoC.

The generalization of the test to the studied population could optimise treatment prescriptions by avoiding unnecessary CT and life-threatening adverse events without survival loss for patients. The use of ODx signature would improve patient’s care and result in cost savings for the national health insurance.

Conflict of interest:
Advisory Board: Experts (EC, MB, VN, DH, J-SF and RR) received fees from Creativ-CEutical for their participation in the scientific committee. EC was part of advisory boards for AstraZeneca and Novartis VN provided her expertise for Takeda.

Other Substantive Relationships: Creativ-CEutical was paid by Exact Sciences for carrying out this modelling project.

183 (PB-096) Poster
Abemaciclib for treating patients with HR+, HER2- advanced/metastatic breast cancer in Spain: a real-world study
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Background: We report the demographic and clinical characteristics, treatment patterns, and treatment outcomes of female patients with hormone receptor positive (HR+), human epidermal growth factor 2 negative (HER2-) advanced/metastatic breast cancer (ABC/MBC) treated with abemaciclib in a real-world setting in Spain.
Material and methods: A multicenter retrospective observational chart review was undertaken of women in Spain with HR+, HER2- ABC/MBC treated with abemaciclib-containing regimens (any line). Descriptive statistics were used to summarize patient characteristics, treatment, and outcomes (tumor response and progression-free survival; PFS) in the study period from 08/2018 to 08/2022 in patients with ≥3 months follow-up data post-abemaciclib initiation (regardless of abemaciclib discontinuation). Kaplan-Meier methods were used to estimate PFS with 95% confidence intervals (CI).

Results: 175 adult women from nine institutions across Spain were included. Median patient age at abemaciclib initiation was 58 years (interquartile range: 50–68 years). The Eastern Cooperative Oncology Group performance status score at the start of treatment was 0 for 71 of 150 patients with these data (47.3%), 1 for 68 (43.5%) and 2 for 11 (7.3%). Eighty-six percent of 172 patients with data had an abemaciclib starting dose of 150 mg, 12.8% a dose of 100 mg or 75 mg, and 1.2% another dose; treatment was twice daily for all but one patient. Mean treatment duration was 11.4 months (standard deviation; SD 8.1 months). Abemaciclib was 1st, 2nd, 3rd, 4th, or 5th line treatment for 52.6%, 18.9%, 15.4%, 5.7% and 5.7% of all patients (n = 175), respectively. The most frequent hormone therapies given in combination with abemaciclib treatment (across all lines of therapy) were aromatase inhibitors (AIs; anastrozole, exemestane or letrozole [54%]) and fulvestrant (38%). Tumor response was available for 124 patients, 42.8% of whom had complete or partial response (Table). Median PFS was 21.5 months across all patients (95% CI 15.8–not reached), with 1-year PFS of 70.3%. Median PFS ranged from 26.0 months (95% CI 15.8–not reached) in the 1st-line setting to 15.3 months (95% CI 8.7–not reached) in the ≥3rd or subsequent-line setting.

Conclusions: Abemaciclib, used in different lines of treatment and mostly in combination with AIs or fulvestrant, in a real-world setting in patients with HR+, HER2- ABC/MBC in Spain, was associated with a median PFS of 21.5 months. These data are comparable to data from clinical trials supporting the benefit of abemaciclib.

<table>
<thead>
<tr>
<th>Best treatment response</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete response</td>
<td>8.1</td>
</tr>
<tr>
<td>Partial response</td>
<td>34.7</td>
</tr>
<tr>
<td>Stable disease</td>
<td>41.9</td>
</tr>
<tr>
<td>Progressive disease</td>
<td>15.3</td>
</tr>
</tbody>
</table>

Conflict of interest:
Ownership: Walid Fakhouri, Alberto Molero, and Silvia Díaz-Cerezo are employees and shareholders of Eli Lilly and Company Ltd.

Corporate-sponsored Research: Isabel Blancas has received grants and research support to the institution from AstraZeneca, Eli Lilly, Roche and Agenda, and honoraria (advisory) from AstraZeneca, Roche, Novartis, Eisai, Celgene, Pfizer, Eli Lilly, Pierre-Fabre, Bristol-Myers Squibb, Daiichi Sankyo, Grunenthal, Seagen and Versacayle.

Other Substantive Relationships: Josep Maria Haro and Lydia Hanaa Faris are employees of Fundació Sant Joan de Déu who conducted the field work for this research under contract to Eli Lilly and Company Ltd. Rodrigo Sánchez-Bayona has received honoraria from Eli Lilly (advisory, speaker), Novartis (advisory, speaker), AstraZeneca (speaker), Seagen (speaker), Clovis Oncology (speaker), and GSK (advisory, speaker).

184 (PB-097) Poster

A Phase III, Randomized, Multicenter, Double-blind Study to Compare Efficacy and Safety of EG12014 (EirGenix Trastuzumab) with Herceptin® as Neoadjuvant Treatment in Combination with Anthracycline/Paclitaxel-based Systemic Therapy in Patients with HER2-positive Early Breast Cancer


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Medical Oncology, Johannesburg, South Africa; Oncology, National Medical Research Centre, St Petersburg, Russia; T’aipei Veteran General Hospital, Taipei, Taiwan; Limited Medical Research Society, Temuco, Chile; GBBG Forschungs GmbH, Neus-Issenberg, Germany.

Background: Amplification and/or overexpression of HER2 in breast cancer (BC) patients is associated with aggressive disease and poor prognosis. Herceptin® (trastuzumab), a monoclonal antibody targeting HER2 in combination with anthracycline- and taxane-based neoadjuvant treatment in women with HER2-positive BC has resulted in improvements in pathological complete response (pCR), event-free survival (EFS) and overall survival (OS). This study was designed to compare efficacy (pCR) and safety between the originator Herceptin® and the proposed trastuzumab biosimilar EG12014. The study was conducted at 89 study sites in 10 countries in Europe, South America, South Africa, and Asia.

Methods: Neoadjuvant phase: 807 patients were randomized (1:1) into 2 arms receiving epirubicin (90 mg/m²) and cyclophosphamide (600 mg/m²) every 3 weeks for 4 cycles, followed by EG12014 (arm 1) or Herceptin (arm 2) (both at loading dose: 8 mg/kg and maintenance dose: 6 mg/kg) and paclitaxel (175 mg/m²) every 3 weeks for 4 cycles. Subsequently, the patients underwent surgery, and primary endpoint (pCR [ypT0/is ypN0]) was assessed. Adjuvant phase: After surgery, the patients received EG12014 or Herceptin with a switch to EG12014 of half of the patients previously receiving Herceptin through a 2:1 randomization (both at loading dose: 8 mg/kg and maintenance dose: 6 mg/kg) to complete 12 months of overall trastuzumab treatment, followed by a 20-week safety follow-up after the final dose of the study drug.

Results: Study population: The mean age was 50 years, the majority of the enrolled patients were Caucasians with tumor stage II, estrogen receptor positive and progesterone receptor negative. The median time from date of first diagnosis was 0.5 months. Primary endpoint pCR (ypT0/is ypN0) was reached with relative risk ratio (RR) for the full analysis set: 0.992 (90% CI 0.880 to 1.118) between the 2 treatment arms. Secondary pCR endpoints (defined as ypT0 ypN0 and ypT1is) were also reached, with RR between the treatment arms: 0.917 and 0.992, respectively. Objective clinical response prior to surgery was similar for the 2 treatment arms: 83.8% and 83.6%, respectively. EFS, OS, safety endpoints (e.g., adverse events, serious adverse events, and toxicity assessments, supported similarity between EG12014 and Herceptin. Immunogenicity of EG12014 and Herceptin was low and comparable during the entire study.

Conclusion: This study demonstrated that EG12014, a proposed trastuzumab biosimilar, matches reference trastuzumab in terms of efficacy, safety, PK and immunogenicity.

No conflict of interest.
Scalp cooling (SC) has been reported to be an effective and non-toxic method for preserving hair during chemotherapy. However, data on the patient’s perspective on effectiveness and applicability of SC in a clinical routine setting are scarce. In this comparative study, we aimed at a longitudinal assessment of patient-reported outcome (PRO) data on the effect of SC on hair preservation and its effect on QOL when applied in clinical routine.

Background: Scalp cooling (SC) has been reported to be effective and safe in preventing chemotherapy-induced alopecia in breast cancer patients (BCPs) - a distressing side-effect highly relevant for a patient’s quality of life (QOL). However, data on the patient’s perspective on effectiveness and applicability of SC in a clinical routine setting are scarce. In this comparative study, we aimed at a longitudinal assessment of patient-reported outcome (PRO) data on the effect of SC on hair preservation and its effect on QOL when applied in clinical routine.

Material and methods: In this non-randomized intervention study, all BCPs treated at the Department of Gynecology and Obstetrics, Innsbruck, receiving taxane or antracycline-based chemotherapy known to be associated with alopecia, were allocated either to the intervention group receiving SC or to the control group (no SC) based on patient preference. All patients completed PRO measures on hair preservation (PRO-CTCAE hair preservation scale) and body image (PRO-CTCAE body image scale) at chemotherapy start (baseline), mid-chemotherapy, last chemotherapy, and after 9 months follow-up.

Results: Overall, we included 113 patients, 75 patients underwent SC treatment. The average patient age was 45 (32–53) yrs, 38 patients standard care (mean age 51.3 years, 52.7% premenopausal), 38 patients standard care (mean age 55.6 years, 39.5% premenopausal). A total of 53 patients (70.7%) discontinued SC, with 39 patients (73.5%) stating alopecia as the primary reason. On average, BCP stayed on treatment with the cooling cap for 40.2% of the duration of their chemotherapy (SD 25.3%). In an intention-to-treat analysis, we found no difference between the SC- and the control group with regard to their self-reported hair preservation (p = 0.831) across the observation period. Overall QOL (p = 0.602), emotional functioning (p = 0.737), social functioning (p = 0.635) and body image (p = 0.463) did not differ between groups.

Conclusions: The majority of BCPs terminated SC treatment early as a result of alopecia. No beneficial effects for QOL including the emotional or social domain as well as body image were observed. This might result from the early discontinuation of SC. In this study sample, the efficacy and tolerability of SC applied in a clinical routine setting proved to be limited. The further determination and up-front definition of criteria prognostic for effectiveness of SC may be helpful to identify patient subgroups that may experience a treatment benefit.

No conflict of interest.
**Conclusion:** Compliance against national guidance has been demonstrated with regards to patient selection for OFS but further work is advised to improve the monitoring and holistic care of these patients, including liaison with primary care. An updated clinical protocol should provide more consistency in the local approach to patients requiring OFS.

**No conflict of interest.**

190 (PB-103)  
Poster  
**Quality of Life of breast cancer patients with COVID-19 disease**  
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**Background:** To study the Quality of Life (QOL) of breast cancer patients who were affected by COVID-19 disease.  

**Materials and methods:** 260 patients diagnosed of breast cancer (90.8% I-III stages) and COVID 19 disease (85% light/moderate) were included between February and September 2021. Patients were receiving treatment for their cancer (mainly hormoneotherapy) or were in the follow-up period.  

Patients were organised in three groups based on the date of their COVID-19 diagnoses: first wave (between March and May of 2020, first group), second wave (June–December 2020 second group); third wave (January–September 2021, third group).  

Patients completed the QLQ-C30, QLCRBr45, and the Oslo COVID-19 QLQ-PW80 questionnaires twice over four months. Patients ≥65 years also completed the QLQ-ELD14.  

First group completed the QLQ questionnaires 10 months after the COVID-19 diagnoses; second group, after seven months; third group two weeks after the diagnosis.  

**Results:** QOL of the patients from the three COVID-19 groups were compared and changes in the QOL of the whole sample (non-parametric tests), Univariate logistic regression analyses were performed to identify which patients’ characteristics were related to low global QOL scale, and also, to changes in this scale between the two assessments.  

**Conclusions:** The best multivariate model to explain changes in the global QOL was a combination of emotional functioning and fatigue (QLQ-C30), endocrine treatment (QLQ-Br45), gastrointestinal (COVID-19 questionnaire) having received targeted therapy (R2 = 0.393). QOL improvements between the two assessments appeared in six QLQ-C30, four QLQ-Br45 and twenty (worsening in two) COVID-19 questionnaire areas. Changes in the global QOL scale were related to eleven QLQ-C30 areas, five QLQ-Br45 areas, twenty-three Oslo COVID-19 areas, cancer treatment and toxicity.  

The best multivariate model to explain global QOL was a combination of emotional functioning and fatigue (QLQ-C30), endocrine treatment (QLQ-Br45), gastrointestinal (COVID-19 questionnaire) having received targeted therapy (R2 = 0.575).

**No conflict of interest.**

191 (PB-104)  
Poster  
** Anthracycline versus no anthracycline neoadjuvant therapy for HER2 breast cancer: real world evidence**  
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**Background:** Several neoadjuvant de-escalation strategies have been investigated in pursuit of reducing the use of chemotherapy, particularly the use of anthracyclines, in HER2+ early breast cancer (EBCC). The main objective of our study was to evaluate pathological complete response (pCR) and event-free survival (EFS) of an anthracycline-free and anthracycline-containing regimen with dual HER2 blockade in patients with HER2+ EBC from an Iberian real-world database.  

**Methods:** We conducted a retrospective multicentric analysis of patients with HER2+ EBC diagnosed and treated in 6 Portuguese and Spanish centers, between January 2018 and December 2021. Our study included patients treated with neoadjuvant therapy with double anti-HER2 blockade with trastuzumab and pertuzumab and chemotherapy followed by surgery. Patients who progressed during neoadjuvant therapy were excluded. The following parameters were analyzed: initial stage, chemotherapy regimen, expression of hormone receptors, Ki-67, type of surgery, type of adjuvant therapy, distant recurrence, and pathological response. Associations between categorical outcome measures, such as stage and pCR were evaluated by chi2 or Fisher’s exact test. The survival analyses were performed for EFS according to the Kaplan-Meyer method.  

**Results:** A total of 287 women were included, with 227 in the anthracycline group (mean age of 52.6) and 60 in the non-anthracycline group - carboplatin, docetaxel and double blockade (TCHP) (mean age of 51). A pCR was recorded in 132 (58.1%) patients in the anthracycline group and in 32 (53.3%) in the non-anthracycline group (p-value = 0.79). The median follow-up for all patients was 3.1 years. A total of 16 EFS events (7.1%) occurred in the anthracycline group and 4 EFS events (6.7%) occurred in the non-anthracycline group (p-value = 0.69). The results were independent of tumor size, hormone receptor and nodal status.  

**Conclusion:** Our pilot study adds new evidence about the efficacy of TCHP compared to an anthracycline-based regimen for HER2+ EBC. Both groups had young patients with similar median ages and few comorbidities, setting up an important rationale in favor of de-escalation with TCHP in this subgroup, thus avoiding the anthracycline-related toxicities.

**No conflict of interest.**

192 (PB-105)  
Poster  
**Neoadjuvant treatment for breast cancer patients in a Venezuelan breast center. Pathologic complete response: Is it worth it?**  
V. Acosta-Marín1, V. Acosta Freites1, A. Ramirez2, C. E. Marin2, A. Contreras1, I. Longobardi3, O. Martinez1, V. Maldonado1, M. Acosta2, J. Patel Fuentes1, 1Ceclines, Breast Surgery, Caracas, Venezuela; 2Ceclines, Breast Pathology, Caracas, Venezuela; 3Ceclines, Breast Pathology, Caracas, Venezuela

**Background:** Neoadjuvant treatment (NAT) increases the probability of pathological complete response in HER2+ breast cancer. According to the pathological response, pCR and pPR, two subgroups of 83 patients each, who met all eligibility criteria, were

**No conflict of interest.**
Results: Tumors Triple negative (TN: OR: 2.6; p < 0.01), with HER2 overexpression (OR = 2.2; p = 0.043), with estrogen receptor (ER) negative expression (OR = 2.3; p = 0.008), with progesterone receptor (PR) negative expression (PRg-negative) (OR = 4.3; p = 0), and with 4K67 expression (OR = 2.2; p = 0.032) were identified as predictive factors of pCR after NAT. Axillary lymph node (ALN) negativityoversaturation was nearly 50% after NAT (pCR: 49.4% (41/83), pPR: 42.2% (35/83)). DFS was better in the PCR group than in the pPR group (5-year DFS: 87.4% vs. 81.6%), although not statistically significant (p = 0.309). In patients with ER negative expression, pCR was predictive of better 5-year DFS (pCR: 91.3%, pPR: 76.1% p = 0.044).

Conclusion: Patients with ER- TN and HER2 positive tumors who receive TNA have a high probability of obtaining pCR, which translates into a greater possibility of conservative surgery. ALN normalization rate after NAT was close to 50%, this implies the possibility of omitting ALN dissection in these patients. Patients with ER-negative breast cancer who could achieve pCR could attain higher DFS after NAC.

No conflict of interest.

194 (PB-107) Poster
Retrospective thorough analysis of regional lymph node recurrence in breast cancer patients (REASON Trial)
A. Liapi1, A. Stravodimou1, V. Aedo1, W. Jeanneret Sozzi2, J. Prior3, M. Nicod Lalonde3, I. Treboux4, L. Lelievre4, L. Rossier5, A. Goupil5, A. Liapi1, A. Stravodimou1, V. Aedo1, W. Jeanneret Sozzi2, J. Prior3, M. Nicod Lalonde3, I. Treboux4, L. Lelievre4, L. Rossier5, A. Goupil5, 1CHUV, Oncology, Lausanne, Switzerland; 2CHUV, Center of Experimental Therapeutics; 3CHUV, Radiology, Lausanne, Switzerland; 4CHUV, Nuclear Medicine and Molecular Imaging, Lausanne, Switzerland; 5CHUV, Service of Gynecology, Lausanne, Switzerland; 6CHUV, Center of Experimental Therapeutics Department of Oncology, Lausanne, Switzerland; 7CHUV, Institute of Pathology, Lausanne, Switzerland; 8CHUV, Oncology, Besancon, France; 9CHUV, Radiology, Lausanne, Switzerland

Background: De-escalation of axillary surgery reduces morbidities without altering survival. Despite of a relatively high rate of residual disease in the axilla after sentinel lymph node (SLN) procedure, the risk of regional lymph node recurrence (RLNR) is very low, due probably to adjuvant radiotherapy and systemic treatments. The characteristics of the small percentage of patients with RLNR are not well known. We performed a retrospective thorough analysis of patients with RLNR.

Materials and Methods: Individual characteristics, radiological and surgical files, histopathology and adjuvant treatments were reviewed in patients presenting a RLNR as 1st event between 2009 and 2020. MammaPrint & BluePrint analyses (MB) was performed in available primary cancer tissues.

Results: Forty patients with a median age of 51 were analyzed. Median follow up was 8 years (range 0.6–34). Most of the patients (85%) had no specific type (NST) breast cancer (BC). Majority (72.5%) had primary hormone receptor positive-HER2 negative (HR+/HER2-) BC, 12.5% triple negative (TN), 2.5% HR+/HER2+, 2.5% HR-/HER2-, 7.5% ductal carcinoma in situ and 2.5% unknown. The median size of the primary tumor was 1.8 cm (range 0.3–7.0) and 57% had no initial lymph node (LN) involvement. Lymphovascular invasion was present in 27.5% of patients. 45% had primary SLN procedure and 53% axillary LN dissection (ALND); 1 patient had no axillary surgery. Half of the patients received neo-adjuvant chemotherapy, 62.5% adjuvant endocrine therapy and 67.5% adjuvant radiotherapy (50% only in breast). Among patients treated with neoadjuvant chemotherapy, all had residual disease after surgery. Recurrence was detected by clinical examination in half of patients. Sixty three percent had only RLNR; 38% had concomitant distant metastases. Among irradiated patients, 63% had some relapse in the radiation field.

MammaPrint & BluePrint classified 70% of the analyzed cancers as low-risk luminal A (82% in HR+/HER2- subgroup), 15% high-risk luminal B, 10% high-risk basal type (TNBC), and 5% high-risk HER2 type (HER2+).

Conclusions: In this study with long follow up, most of the patients with regional lymph node recurrence had HR+/HER2- disease and were classified as low-risk luminal A by genomic signature. There is currently a lack of information regarding the small number of patients, who present with regional lymph node recurrence. The goal of the trial was to investigate a small sample of patients, but very thoroughly in order to generate hypothesis. Complete results will be presented.

No conflict of interest.

Poster Session

195 (PB-108) Poster
Clinical benefit and tolerability of CDK4/6 inhibitors in the treatment of breast cancer advanced in the geriatric population – real life data from a Hospital Center
M. Costa1, A.C. Valente1, M. Freitas1, C. Almeida1, C. Teixeira1, M. Gonçalves1, N. Tavares1, D. Almeida1, C. Caiero1, I. Augusto1, I. Sousa1, M. Barbosa1, 1Centro Hospitalar e Universitário São João - Porto, Medical Oncology, Porto, Portugal

Background: Several phase 3 clinical trials have demonstrated the benefit of CDK4/6 inhibitors (CDK4/6) associated with endocrine therapy on survival outcomes, with a manageable toxicity profile. Despite the high prevalence of breast cancer patients over 65 years, this population is usually under-represented in trials, which leads to a lack of data from younger and healthier patients. However, the geriatric population is heterogeneous in terms of comorbidities and performance status. The aim of this study is to evaluate the clinical benefit (CB) and toxicities of ribociclib (R) and palbociclib (P) in the elderly population of our Center.

Materials and methods: Retrospective study of clinical data of patients aged ≥65 years, treated with ICDC4/6≥1 month, between February 2017 and July 2020. Time to treatment failure (TTF) was defined as the period of time between the start of treatment and disease progression. CB was defined as stable disease in a period ≥6 months. Statistical analysis was performed with SPSS® software (V27).

Results: All patients were female, with a median age of 69.5 y (65–85) at initiation of treatment with ICDC4/6. Half had between 65 and 69 y (n = 11), 45% between 70 and 79 (n = 10) and one ≥80 years old. All patients had EOCG PS 0–1, except the oldest. Of patients aged 65–69 y, 36.4% (n = 4) had advanced disease at diagnosis. The median time from diagnosis to distant metastasis was 78 months [0–208]. Regarding the location of the metastases, 45.5% (n = 5) only had bone disease. ICDC4/6 was proposed in 1st line in 63.6% (n = 7) of patients. Of patients aged 70–79, 20% (n = 2) had advanced disease at diagnosis. The median time from diagnosis to distant metastasis was 74.5 months [0–258], with half of the patients having metastasis of ≥ one organ. ICDC4/6 was proposed in the 1st line in half of the patients. Of the patients treated with CDK4/6 in 1st line (n = 13), 53.8% had multiple metastases, in 92.3% ≥3 sites. About 54% of patients were treated with R. The most common G3 toxicity was hematological (neutropenia in 30.8%) and cardiac (15.4%), requiring dose reduction in 30.8%. The CB rate (n = 115) was 92.3%. TTF median was 35 months [3–35]. There was disease progression in 38.5%. In patients treated with ICDC4/6 in 2nd line (n = 9), all were treated with P. The most frequent G3 toxicity was hematological (neutropenia in 66.7%) which is why there was a 1st reduction dose by 33.3% and a 2nd reduction by 22.2%. CB was 66.7%. The TTF median was 7 months [3–35]. There was disease progression in 88.9%.

Conclusion: Although the sample size does not allow definitive conclusions, the results of BC and toxicity profile in the geriatric population treated with ICDC4/6 are in agreement with the literature. It is necessary to include this population in future studies, with an optimized geriatric evaluation, for better treatment of these patients.

No conflict of interest.

196 (PB-109) Poster
The relationship among bowel FDG-PET uptake, pathological complete response, and eating habits in breast cancer patients undergoing neoadjuvant chemotherapy
P. Tiberio1, L. Antunovic2, M. Gaudio3, A. Vigna3, M. Pastore1, C. Miggiano1, F. Jacobs1, C. Benvenuti1, E. Farina1, A. Chiti2, A. Santoro1, R. De Sanctis1, 1IRCCS Humanitas Research Hospital, Medical Oncology and Hematology Unit, Rozzano Mi, Italy; 2IRCCS Humanitas Research Hospital, Nuclear Medicine Unit, Rozzano Mi, Italy; 3IRCCS Fondazione Don Carlo Gnocchi, Neurology Unit, Milano Mi, Italy

Background: In the last decades, the impact of patients’ lifestyle behaviors, including eating and exercise habits, on breast cancer (BC) management have been deeply explored. Several studies have demonstrated that healthy diet and exercise might improve overall survival after BC diagnosis and patients’ quality of life, by reducing chemotherapy side effects, limiting comorbidities, and enhancing therapeutic efficacy. Besides the impact on BC management, dietary components have also been found to have profound effects on inflammation. In this study, we investigated whether pro-inflammatory behaviors could correlate with bowel FDG uptake and the latter, in turn, with pathological Complete Response (pCR) to standard neoadjuvant chemotherapy (NAC).

Materials and methods: The study included stage I-II BC patients undergoing NAC at IRCCS Humanitas Research Hospital in Rozzano, Italy.
At baseline, patients fulfilled a survey concerning eating and lifestyle habits. In the absence of data on the effects of individual foods, the frequency of consumption of specific food items were aggregated for their inflammatory properties: alcohol and spirits as “pro-inflammatory drinks,” red and cured meats as “pro-inflammatory foods,” fruits and vegetables as “anti-inflammatory foods.” Before NAC, women performed a whole-body staging [18F-FDG PET/CT scan. On PET/CT images, two regions of interest were designed on the area of highest uptake in the recto-sigmoid district and in the colon, respectively, and radiotracer mean standardized uptake values (SUVmean) were extracted.

Results: Data were completely recorded for 82 women (median age: 48 years), of whom 29 were diagnosed with triple-negative BC, 45 with a HER2-positive BC, 7 presented a Luminal B tumor, and 1 had a Luminal A BC. At baseline, most women showed a correct intake of alcohol and spirits, fruits and vegetables, and cereals, and exercised regularly. However, we noticed that only 3.7% of patients followed a healthy diet before BC diagnosis. We found positive correlations between colon SUVmean and pro-inflammatory foods (r = +0.33, p = 0.01) and foods (r = +0.25, p = 0.04) and a significant negative correlation between rectum SUVmean and anti-inflammatory foods (r = −0.23, p = 0.04). No statistically significant associations emerged with BC outcomes measured as concordance, and TILs score was significantly lower in patients with pCR compared with non pCR (p = 0.02).

Conclusions: Our study showed, for the first time, that bowel FDG uptake was affected by patients’ anti- and pro-inflammatory eating habits and that colon SUVmean was correlated with pCR. Thus, proposing a new role for colon inflammation, and potentially for unhealthy foods and drinks causing it, in NAC response. Furthermore, our findings suggested that PET scan could be an easy instrument for identifying patients presenting unhealthy lifestyle habits.

No conflict of interest.

197 (PB-110) Poster Agreement on risk assessment and chemotherapy recommendations among breast cancer specialists: a survey within the MINDACT cohort

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Background: Tailored recommendation for adjuvant chemotherapy in breast cancer is of great importance. Gene signatures, such as the 70-gene signature (MammaPrint®), have shown to provide additional prognostic information and are used to refine risk estimations and adjuvant chemotherapy recommendations for individual patients, and have been incorporated in international guidelines. This survey assessed agreement among oncologists on risk assessment and chemotherapy recommendation, the impact of adding the 70-gene signature result on clinical-pathological characteristics, and changes over time.

Material and methods: A survey consisting of 37 discordant patient cases (e.g., clinical high/genomic low or clinical low/genomic high risk) from the EORTC 10041/BIG 3-04 MINDACT study (T1-3N0-1M0) was sent to European breast cancer specialists from 13 countries for assessment of risk (high or low) and chemotherapy administration (yes or no). In 2015 the survey was sent twice (survey 1 and 2), several weeks apart, and in 2021 a third time (survey 3). Only the second and third surveys included the 70-gene signature result. Overall agreement among breast cancer specialists and agreement with the 70-gene signature were measured as concordance, and compared between the three surveys. Furthermore, the overall number of high or low risk assessments and chemotherapy recommendations were evaluated.

Results: 82 breast cancer specialists participated in the first survey, and 41 participated in all three surveys. Overall agreement between respondents on risk assessment decreased slightly between survey 1 and 2 (from 66.5% to 60%), but increased again in survey 3 (66.9%). On the other hand, there was an increase in agreement with the 70-gene signature result on risk assessment, from 37% in survey 1 to 60% in survey 2, further increasing to 71% in survey 3. With information available indicating a low risk 70-gene signature (n = 25 cases), 20% of risk assessments changed from high to low and 19% of recommendations changed from yes to no chemotherapy in survey 2 versus 1, further increasing with 18% and 21%, respectively, in survey 3 versus 2. For all cases, the number of high risk assessments decreased from 64% in survey 1 to 34% in survey 3, and the chemotherapy recommendations decreased from 67% in survey 1 to 26% in survey 3.

Conclusion: There is a variability in risk assessment of early-stage breast cancer patients among breast cancer specialists. The 70-gene signature provided valuable information, resulting in fewer patients being assessed as high risk and fewer recommendations for chemotherapy, increasing over time. This study also shows the impact that large clinical trials investigating the use of gene signatures have had on the international care for early-stage breast cancer patients.

No conflict of interest.

198 (PB-111) Poster Prediction of axillary complete pathological response after neoadjuvant treatment in breast cancer n1 patients

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Introduction: Primary systemic therapy (PST) treatment may allow to decrease tumor breast size and clinic axillary disease. This situation favors the “rescue” of surgical patients with axillary node disease. There are immunological parameters, including Tumour-infiltrating lymphocytes (TILs), which have been identified as predictors of the radiological and pathological response to neoadjuvant chemotherapy in the breast cancer patients. We are interested in assessing the relationship between Tumour-infiltrating lymphocytes (TILs) and pathological response in axillary disease breast cancer patients after PST.

Aim: To assess the relationship between pretreatment peritumoral lymphocytic infiltration (TILs) in biopsy specimens and axillary response in “n1” patients after PST.

Methods: We performed an observational study of breast cancer patients operated after neoadjuvant treatment (NT) in a University Breast Unit from January 2018 to December 2019. TILs were estimated in corebiopsy specimen before PST and after the treatment in breast surgical specimens. The tumor response to the NT was also assessed by Miller and Payne (M&P) system and the residual cancer burden (RCB). MRI and ultrasonography were performed before and after NT to assess the breast and axillary radiological response to the treatment.

Results: In this period 105 patients were included. The average age was 49 (32-68) year old. The most frequent histological type was invasive ductal carcinoma (83 and the distribution of intrinsic phenotypes was luminal A 11.4%, luminal B 60%, HER-2 12.4% and triple negative 16.2%. The average ki67 was 38 ± 2 TILs were observed in 74.2% of patients with an average infiltrative lymphocytes percentage of 30.3 ± 28%. 48 patients of the 105 patients treated with PST were “n1” at the cancer diagnosis time. In the other 57 initially “n0” patients, it was found 9 axillary positive patients, in the sentinel node biopsy performed after the PST. Finally, 57 (48 + 9) patients with axillary disease were included in the study. 29.8% patients showed axillary complete pathological response (axCPR) after PST (ypN0), ypN0 patients associated a higher percentage of TILs (40.3 ± 2 vs 22.3 ± 1; p = 0.032), a higher ki67 (46.2 ± 5 vs 28.7 ± 2; p = 0.001) and a higher nuclear grade (2.47 ± 0.2 vs 2.03 ± 0.1; p = 0.068). Furthermore, the number of positive lymph nodes, after PST, was inversely correlated to the percentage of TILs (R = −0.272; p = 0.047) and the ki67 (R = −0.356; p = 0.007). In the
multivariate study, we observed only nuclear grade as a clear independent factor of ypT0 (B = 0.187, p = 0.044).

Conclusions: TILs, ki67 and nuclear grade in the initial biopsy could help us to predict the axillary response to PST. The use of these "biomarkers" can help select patients who benefit from PST in order to reduce the aggressiveness of surgery.

No conflict of interest.

199 (PB-112) Poster
A systematic review on management of breast cancer patients during the covid 19 pandemic: To assess if there was a clinical delay in treatment and patient perception on delayed treatment. Literature review of the current covid 19 management guidelines for breast cancer patients
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Background: During the peak of Covid19 pandemic, healthcare organizations had to restructure to ensure management of covid 19 patients as well as cancer patients. The aim of this study is to assess if there were delays in the management of breast cancer patients in the United States of America, the United Kingdom and the European and did the patient report that there were delays in their treatment during the pandemic compared to pre pandemic.

Methods: A systematic review was conducted in 2021 after an extensive search in PubMed (Medline) and Ovid (Cochrane) databases. The articles were extracted in the first stage based on titles and in the second stage they were extracted by titles and abstracts. 21 articles were assessed out of which 10 articles were further evaluated via Quadra-2 tool quality assessment tool. The inclusion criteria were that the studies that were published between March 2020–March 2021, and were conducted in the United States of America, the United Kingdom and Europe. They were written in English language.

Results: 744 articles were found, out of which 723 studies were excluded during screening and remaining 21 studies were selected for full text reading out of which 11 studies didn’t meet the criteria and finally 10 studies were selected for quality assessment. Breast outpatient clinics services saw an increase in delays during the covid 19 pandemic followed by breast imaging whilst breast cancer surgeries were not affected significantly. Similarly, the patients reported maximum delays in breast cancer outpatient follow up followed by breast imaging and breast cancer surgery.

Conclusion: The services affected with the most delays were in coherence with the guidelines set out by the American Society of breast Surgeons, The European society for Medical Oncology and the European consortium.

No conflict of interest.

201 (PB-114) Poster
Evaluation of neoadjuvant chemotherapy response in breast cancer: radiological and pathological concordance
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Background: MRI is the most used test for the evaluation of neoadjuvant chemotherapy (NAC) response in breast cancer. However, sometimes the pathological analysis of surgical piece reveils discordance with pre-surgical radiological response. The purpose of the study was to evaluate radiological-pathological concordance of NAC response and to define which factors are associated with this coincident result.

Material and methods: A retrospective observational study was conducted including 233 patients with breast cancer who received NAC treatment in a regional hospital between September 2009 and January 2022. Breast MRI before surgery was practiced to all cases included in order to evaluate chemotherapy response. Data collected over this period were associated to higher radiological-pathological concordance in univariate analysis.

Results: Of 233 patients, 161 (69.1\%) present a coincident result in pre-surgical MRI and surgical piece biopsy while 72 (30.9\%) were non coincident: 52 (72.2\%) false negatives and 20 (27.8\%) false positives. Univariate analysis showed statistically higher concordance in patients with palpable tumor (p = 0.007), HER 2 and triple negative phenotypes (p = 0.032) and partial response result on pre-surgical RMI (p < 0.001). However, non-statistical differences were detected on age, tumor diameter, microcalcifications, axillary affection and cellular type. On multivariate analysis, pathological and pathological response concordance was statistically related to triple negative tumor (p = 0.003) and HER2 (p = 0.008) or triple negative (p = 0.001) phenotypes.

Conclusions: MRI presented a high positive predictive value (82\%) while negative predictive value seems to be more limited (56\%), so in cases with pathological detection on MRI the concordance with biopsy of surgical piece will be probably higher. Also tumor palpation and phenotype are factors associated to higher concordance of both results as is well known in literature.

No conflict of interest.
No conflict of interest.

202 (PB-115) Poster
Pathologic complete response in triple negative breast cancer- A single Portuguese center experience
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Background: Triple-negative breast cancer (TNBC) accounts for 15–20% of all invasive breast cancer (BC) and is frequently associated with adverse prognosis. Pathologic complete response (pCR) has been associated with improved survival in early-stage BC. While anthracycline and taxane-based neoadjuvant chemotherapy (NCT) remains the standard of care, addition of platinum seems to increase pCR rate, with no significant difference in survival. Objectives of this study are to review clinical decisions regarding NCT and to evaluate the pCR rate in TNBC patients (pts) in our centre.

Material and methods: A retrospective study was performed on pts diagnosed with stage III-IV TNBC who received neoadjuvant therapy followed by surgery at our centre between Jun/2019 and Oct/2021. TNBC was defined as ER/PR 0–10%, and HER2 negative (0) or low (1+ and 2+ with negative SISH). pCR was defined as disappearance of all invasive cancer in the breast and axilla. Data was collected from the medical records.

Results: A total of 109 female pts was included in this study. Median age at diagnosis was 52.2 years (21–87). For pts consenting on genetic testing (n = 29), 21% had breast cancer candidates to NCT. Median pathological complete response (pCR) was 44% (95% CI 30–57). Complete response in 41% (95% CI 35–47) and no disease in 20% (95% CI 12–28) of pts. Platinum based NCT led to pCR in 44% (95% CI 34–54) vs 37% (95% CI 28–47) for those of important neoadjuvant trials. This is possibly explained by high prevalence of grade 3/high Ki67 tumours. This trend will be interesting to follow, as a high event-free survival is expected after a longer follow up is achieved. This is particularly interesting because pCR rate could not be validated as a surrogate endpoint for survival, although it is increasingly used as a primary endpoint in neoadjuvant clinical trials.

No conflict of interest.

203 (PB-116) Poster
Auxiliary Nodal Management in the setting of Neoadjuvant Chemotherapy
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Background: In patients with breast cancer candidates to neoadjuvant therapy (NAT), the timing to perform sentinel lymphatic node biopsy (SLNB) remains controversial. The aim of this study was to compare the advantages and disadvantages of SLNB performed before and after NAT regarding the-delay in starting NAT, the identification rate of SLNB and the reduction in axillary lymphadenectomies.

Material and methods: A total of 310 patients diagnosed of T1-T4 N0 breast cancer candidates to NACT from June 2006 to April 2014, and 203 patients with SLNB performed after NAT from May 2014 to May 2018. Survival in both groups were compared after a propensity score matching.

Results: SLNB after NAT decreases the delay in starting NAT from 24 to 17 days of median (p < 0.001). The identification rate was 100% when SLNB was performed before NAT and 99% after NAT. The SLNB was positive in 45/107 (42.1%) before NAT (29% macrometastases and 13.1% micrometastases) versus 25/203 (12.3%) after NAT (5.4% macrometastases and 6.9% micrometastases); therefore, lymphadenectomy rate was significantly higher in the SLNB before NAT group: 29.8% vs 7.39%.

Conclusions: SLNB after NAT reduces significantly the lymphadenectomy’s rate and allows to start earlier the systemic treatment, and may even improve survival. SLNB after NAT seems to have more advantages for the patients than before NAT.

No conflict of interest.

204 (PB-117) Poster
North East England outcomes in node positive breast cancer from the real world use of 21 gene recurrence score testing
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Background: 21 gene recurrence score (RS) testing is routinely used to help decide management of early, hormone receptor positive, HER2 negative breast cancer without nodal spread. Recent data from Kalinsky et al (2021) has suggested value from RS testing in the management of patients with node positive disease, permitting postmenopausal women with stage N1 disease and a RS 0–25 to avoid toxic adjuvant chemotherapy safely.

Methods: We recently studied the real-world outcomes from adjuvant treatment of unselected breast cancer patients in those who had a genomic RS performed by the oncology team based at the Northern Centre for Cancer Care (NCCC) in Newcastle Upon Tyne from 2011–2021. We were keen to investigate the benefit to those patients in our cohort with nodal spread to determine the benefit for our patients of RS testing in this setting, by reviewing the outcomes, via disease free and overall survival for those who have completed 3 years or more of follow up. The data from 974 recurrence
scores in the entire cohort were reviewed to determine patients who had undergone testing with node positive disease.

**Results:** Two hundred and thirty two tumours were node positive (80 had micrometastases, 148 had 1–3 nodes, and 4 tumours had more than 4 involved nodes). These tumours came from 225 patients; of these 83 were pre-menopausal, 81 patients (37%), 53 patients had a low RS, 130 intermediate and 42 a high RS. Mean RS was 19 (range 4–43).

From the postmenopausal patients, there were no local recurrences, and 4 distant recurrences; half of these had a high RS and half an intermediate RS (1% of postmenopausal group for each category of RS). From the premenopausal patients, only 8 patients had ovarian function suppression (DODS) documented as part of their endocrine therapy (10%). In the intermediate risk group, only 1 patient had a local recurrence, and there were no distant recurrences.

**Conclusions:** Whilst our population under investigation was limited as 21 gene RS testing was not approved within the NHS at the time of this study, the aim is to share results from this real-world dataset to enable comparison with emerging data in this field. Our data compliments published data suggesting benefit of RS testing in the management of patients with early, node positive breast cancer.

**No conflict of interest.**

**205 (PB-118) Poster Behavior of locally advanced invasive lobular carcinoma according to primary treatment**

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**Background:** Currently the management of BC does not differ according to histology, although ILC is considered a different clinical entity and its study and treatment should be better defined. There is controversy about the benefit of using neoadjuvant systemic therapy with chemotherapy (CT) or hormonal therapy (HT), so therefore, a deeper analysis of the behavior of this BC histology is needed.

**Material and methods:** A retrospective observational cohort study of patients affected by locally advanced ILC of our breast unit. The cohort were grouped in 3 according to the primary therapies: surgery, chemotherapy or hormonal therapy. Comparisons of clinical characteristics between the 3 study groups were analyzed using Student’s t-test for continuous variables and Chi-square or Fisher’s tests for qualitative variables. The primary endpoint of this study was overall survival (OS) and disease-free survival (DFS).

**Results:** OS and DFS curves were obtained using the Kaplan-Meier methods and the impact of risk factors was evaluated in univariate and multivariate Cox regression models.

**Conclusions:** Patients treated with surgery had more favorable baseline prognostic factors, compared to those treated with CT who had worse baseline characteristics (postmenopausal p = 0.001, lymph node involvement p = 0.001, lymphovascular invasion p = 0.002). OS and DFS at 5 years were higher in the CT group (OR, 92%, 95% CI, 85,2–99,6; p = 0.03 and OR, 89%, 95% CI, 80,4–97,4; p = 0.04, respectively) (table 1). Pathological lymph node involvement ≥N2 (OR, 9.76; 95% CI, 2.38–39.95; p = 0.002) and the use of adjuvant CT (OR, 4.34; 95% CI, 1.01–18.71; p = 0.04) appeared to be independent risk factors for recurrence. The use of adjuvant hormonal therapy for 5 years was a protective factor for recurrence (p = 0.03) and prolonged use of it (5–10 years) could offer even more protection (p = 0.06).

**Conclusions:** The prognosis of locally advanced ILC in our population was better in the group treated with primary surgery. Although we should consider this group had better baseline characteristics, compared to HT and CT group, this was the one with the worst prognostic factors. Prolonged HT more than 5 years could be a protective factor for recurrences.

**Table 1.**

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<td>0.04</td>
</tr>
<tr>
<td>CT</td>
<td>71.4%</td>
<td>71%</td>
<td>69.7%–98.5%</td>
<td>0.07</td>
</tr>
<tr>
<td>HT</td>
<td>84.1%</td>
<td>84%</td>
<td>69.7%–88.5%</td>
<td>0.07</td>
</tr>
</tbody>
</table>

SLE: disease-free survival, OR: Odds ratio, CI: confidence interval, OS: overall survival, CT: chemotherapy, HT: hormone therapy.

**No conflict of interest.**
Efficacy and safety of the biosimilar QL1206 compared with denosumab in breast cancer with bone metastases: subgroup analyses of a phase III study

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Background: The prevalence of bone metastases in advanced breast cancer is high (>70%). QL1206 is a biosimilar for denosumab (Xgeva®, Amgen Inc.) and has demonstrated equivalence to the reference product in previous Ph I bioequivalence trial and Ph II trial. Here we present the results of these analyses in breast cancer subgroup.

Material and methods: Patients (pts) with histologically or cytologically confirmed solid tumors and ≥2 metastatic bone lesions were randomly assigned 1:1 to receive QL1206 or denosumab 120 mg subcutaneously Q4W for 3 cycles, stratified by tumor types (breast cancer, lung cancer, or the others), previous skeletal-related event (SRE), and current systemic antitumor therapy (yes or no). Thereafter pts in denosumab group switched to QL1206 treatment and up to 10 additional doses of QL1206 could be given to both groups. The primary endpoint was percentage changes in urinary N-telopeptide of type I collagen (uNTX)/urine creatinine (uCr) from baseline to Week 13.

Results: For the breast cancer subgroup (n = 311), 155 pts were assigned to QL1206 and 156 pts were assigned to denosumab. Overall, the median age was 52 years (range, 27–78), 59.6% pts had an ECOG PS of 1 or 2. 99.0% pts received concurrent systemic therapy. At week 13, median percentage change in uNTX/uCr from baseline in QL1206 group was similar to denosumab group (~69.9% vs ~74.3%). The least-squares means difference between the two groups was 0.085 (90% CI, –0.089; 0.212). The median time to first onset of SRE was not estimable for both groups. 70.0% pts in QL1206 group and 73.1% pts in denosumab group experienced ≥1 SRE. The overall prevalence of bone metastases in advanced breast cancer was 98.6% (QL1206) vs 98.1% (Denosumab). In this group of patients, the prevalence of bone metastases in advanced breast cancer was 98.6% (QL1206) vs 98.1% (Denosumab).

Conclusions: QL1206 demonstrated numerically similar efficacy results and similar safety profile to denosumab in breast cancer patients with bone metastases, supporting it as a potential option for this population.

Conflict of interest:

Corporate-sponsored Research: This research was sponsored by Qilu Pharmaceuticals Co., Ltd.

Other Substantive Relationships: Cuicui Han, Yujie Li, and Xiaoyan Kang are employees of Qilu Pharmaceutical Co., Ltd.

208 (PB-032) Poster

Intrinsinc tumor subtype in hormone receptor (HR) positive, human epidermal growth factor receptor 2 (HER2)-negative advanced breast cancer (ABC) treated with cyclin-dependent kinase 4/6 inhibitors (CDK 4/6) and endocrine therapy (ET) – a retrospective analysis of real world data

T. Martins1, M. Vitorino1, A. Mendes1, R. Vicente1, A. Del Rio3, C. Santos1.

Poster Session

Hospital Professor Doutor Fernando Fonseca- EPE, Medical Oncology, Amadora, Portugal

Background: CDK 4/6 inhibitors significantly improve outcomes for patients (pts) with HR positive, HER2-negative ABC. In this group of patients, the HER2-Low (HER2-L) subtype represents 50–60% and is characterized by poor prognosis. In this retrospective analysis we explore the role of intrinsic tumor subtype (luminal A, luminal B and HER2-L) as a predictor of clinical outcomes in patients treated with ET plus CDK 4/6 inhibitors.

Methods: This is a retrospective study of 49 consecutive pts with HR positive, HER2-negative ABC treated with CDK 4/6+ET from 2018 to 2020 in Hospital Prof. Dr. Fernando da Fonseca (Amadora). Tumor subtype was determined by immunohistochemistry (IHC) before CDK 4/6 (primary tumors biopsies). In our statistical analyses we used Fisher’s exact and chi square tests and Kaplan Meier analysis (SPSS software for Windows version 28.0.0.0).

Results: 49 pts (96% women, of which 67.4% post menopause, median age of 57 years and 40.9% with metastatic disease at diagnosis), 79.6% received ribociclib and 20.4% received palbociclib, plus ET (34.4% fulvestrant, 65.3% aromatase inhibitor). 71.4% of pts had no previous treatment for metastatic disease. Subtype distribution: Non Her2-L (luminal A and luminal B- 53.1%) and Her2-L (46.9%). Median progression-free survival (PFS) for HER2-L disease was 5.0 months (mo) (95% confidence interval [CI] 0.0–10.8) and 13.0 mo (95% CI 10.2–15.8) for non Her2-L disease (adjusted hazard ratio [HR] = 1.44, p = 0.459). Median overall survival (OS) for Her2-L disease was 16.2 mo (95% CI 20.3–83.7) and 22.3 mo (95% CI 20.4–107.6) for non Her2-L disease (HR = 3.5, p = 0.172). The overall response rate of CDK 4/6+ET in Her2-L disease was 60% and 65% in non-Her2-L disease.

Abstracts, EBCC-13
Conclusions: Despite the limitations of a small sample and the statistically non-significant PFS and OS HR, our results may indicate a poor prognosis for Her-2 disease and the potential clinical utility of intrinsic tumor subtype as a biomarker in patients with HR-positive/HER2-negative ABC.

No conflict of interest.

209 (PB-033) Poster
Our early experience with Magseed and Savi-scout localization against wire localization Breast conserving surgery in impalpable breast cancer
S.M.M. Tin1, E. Rezkallah1, I. Cheema1, W. Elsalfy1, M. Shaabani1. 1South Tees University Hospitals NHS Foundation Trust, Surgery, Middlesbrough, United Kingdom

Background: Image-guided preoperative localization is mandatory for guiding surgery of non-palpable lesions to improve both oncological and cosmetic outcomes. Our purpose of this study is to determine the outcomes of Magseed and Savi scout localization guided excision of non-palpable breast cancer and compare it to wire guided wide local excision. These outcomes include successful localization, retrieval, margin involvement and re-excision rate.

Material and methods: This was a retrospective cross-sectional cohort study of patients undergoing breast conserving surgery for impalpable breast cancer between November 2019 to September 2022. Patients were divided into three groups based on localization techniques: wire localization (WL), Magseed localization (ML) and savi-scout localization (SCL). Age, tumour size and specimen weight were compared with One-way Anova test and involved margin rate, re-excision rate and misplacement rate were compared with Chi-square test. Localization and retrieval rate were showed with percentage.

Results: There were 75 patients in this study. Each group included 25 patients. There was no statistically difference of age between groups (p = 0.76). Tumour size was 20.76 mm (WL), 15.06 mm (ML), 20.18 mm (SCL) and p value is 0.02. Specimen weight was 40.46 gm, 60.74 gm, 81.84 gm for WL, ML and SCL respectively (p = 0.16). Positive margin was 16% for WL, 4% for ML and 8% for SCL (p = 0.33). Re-excision rate was 16% (4), 0% (2) respectively (p = 0.31) and there was no statistically significant. Misplacement of wire (>2 cm from tumour) was 2 cases (WL), 1 case (ML) and 1 case (SCL).

Table: Comparison of outcomes of image guided localization techniques

<table>
<thead>
<tr>
<th>Type of localization</th>
<th>Wire</th>
<th>Magseed</th>
<th>Savi-scout</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, Mean (SD)</td>
<td>62.71 (8.96)</td>
<td>60.08 (8.18)</td>
<td>60.36 (13.21)</td>
<td>0.76</td>
</tr>
<tr>
<td>Min-max</td>
<td>46–71</td>
<td>47–80</td>
<td>33–78</td>
<td></td>
</tr>
<tr>
<td>Tumour size (mm)</td>
<td>20.76 (12.42)</td>
<td>15.06 (8.89)</td>
<td>20.18 (10.51)</td>
<td>0.02</td>
</tr>
<tr>
<td>Specimen weight (gm)</td>
<td>40.46 (16.09)</td>
<td>60.74 (29.50)</td>
<td>81.84 (64.21)</td>
<td>0.16</td>
</tr>
<tr>
<td>Localization rate</td>
<td>100%</td>
<td>96% (24/25)</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Retrieval rate</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Signal loss during procedure % (No)</td>
<td>NA</td>
<td>1% (1/25)</td>
<td>8% (2/25)</td>
<td></td>
</tr>
<tr>
<td>Re-excision % (No)</td>
<td>16% (2/25)</td>
<td>4% (1/25)</td>
<td>4% (12/25)</td>
<td>0.77</td>
</tr>
<tr>
<td>Margin involved by DCIS % (No)</td>
<td>16% (4)</td>
<td>1% (1/8)</td>
<td>2% (2)</td>
<td>0.33</td>
</tr>
<tr>
<td>Re-excision – % (No)</td>
<td>16% (4)</td>
<td>0</td>
<td>8% (2)</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Conclusion: Pre-operative non-wire non-radioactivity localization are promising techniques for impalpable breast cancer to obtain clear margin and reduce re-excision rate. Our study showed there was no statistical significance outcomes. Magseed and savi-scout localization had less cases with positive margin and re-excision rate.

No conflict of interest.

210 (PB-034) Poster
Unusual ocular manifestations of breast carcinoma: A single institute case series in the Indian population
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Background: Orbital remains an infrequent site for metastasis and this occurs in 3% of breast cancer patients. On the contrary, orbital metastasis by itself are uncommon with an incidence of 1–13% but, breast cancer accounts for 28.5–58.8% of all metastases to the orbit, making it the most common tumour that metastasizes to the orbit. We aim to retrospectively evaluate all the patients who had breast cancer with orbital metastases and analyse the clinicopathological features, symptoms and survival.

Methods: We retrospectively evaluated all patients who were diagnosed with orbital metastasis from breast cancer, at the Tata Memorial Centre between 2009 and 2019. The clinicopathological characteristics and follow-up details were obtained from Electronic Medical Records.

Results: All the patients had a clinical history of breast cancer of which 40% (10/25) of the patients Denovo metastatic disease at presentation. Invasive Ductal Carcinoma (IDC) was the most common primary histology; 84% (21/25) out of which 32% (8/25) patients were triple negative breast cancer (TNBC), 56% (14/25) patients were hormone positive alone (ER+/PR+) and 12% (3/25) patients were her 2 neu enriched. Majority of the patients being of premenopausal status, 48% (12/25). All patients were treated with a multidisciplinary approach including surgery, chemotherapy and radiation therapy whenever indicated as per institutional protocol. The time to metastatic progression varied widely, 20% (5/25) patients were diagnosed with Denovo primary breast cancer with orbital metastasis on the first visit i.e. synchronously. Around 48% (12/25) patients developed orbital metastases after treatment completion and a Disease-Free Interval of 6 months to 1 year, 4% (1/25) patients progressed while on adjuvant therapy and 4% (1/25) progressed while on neoadjuvant chemotherapy.

Among these 25 patients with orbital metastasis, the mode of diagnosis was MRI scan, CT scan of brain and involved margin rate, re-excision rate and misplacement rate were compared with Chi-square test. Localization and retrieval rate were showed with percentage.

Conclusion: On the basis of the data, we conclude that Orbit is a rare site of metastasis for breast cancer and is almost always associated with other systemic sites and requires multimodality treatment. Recognition of metastatic disease and early treatment are important to maximise palliative treatment in breast cancer patients.

No conflict of interest.

211 (PB-035) Poster
Breast cancer management with CDK4/6 inhibitors as first line treatment: a single institution retrospective review
P. Villa1, C. Corbetta1, A. Crippa1, D. Pelizzoni1, I. Vittimberga1, G. Sani1, J. Arnoffi1, F.M. Guida1, O. Cuomo1, M. Tafuni1, M.C. Sassone1, C.V. Vigano1, M. Anghilieri1, A. Arzidzoa1. 1AASST Lecco, Medical Oncology, Lecco, Italy

Background: The excellent results of phase 3 randomized trials have rendered cyclin-dependent kinase 4/6 inhibitors (CDK4/6i) combined with endocrine treatment (ET) as the new standard of care for both endocrine-sensitive and -resistant patients (pts). We performed a single institution retrospective review of pts with metastatic hormone receptor positive (HR+) HER2 negative (HER2-) breast cancer (MBC) receiving CDK4/6i in I line setting.

Methods: From 06/2017 to 4/2022 we identified 97 HR+/HER2-MBC pts treated with CDK4/6i combined with aromatase inhibitors (AI) or fulvestrant in I line setting. We assessed progression-free survival (PFS), time to progression (TTP) on II-line therapy and overall survival (OS) using the Kaplan–Meier method.

Results: Ribociclib was the most CDK4/6i prescribed (48.5%) followed by palbociclib (40.2%) and abemaciclib (11.3%). Abemaciclib was commonly prescribed with fulvestrant (90.9%), ribociclib and palbociclib with letrozole (95.7% and 82% respectively). Patient median age was 65 years (range 34–85) and 58.8% of all metastases to the orbit, making it the most common tumour that metastasizes to the orbit.

Conclusion: Despite the limitations of a small sample and the statistically non-significant PFS and OS HR, our results may indicate a poor prognosis for Her-2 disease and the potential clinical utility of intrinsic tumor subtype as a biomarker in patients with HR-positive/HER2-negative ABC.

No conflict of interest.

Abstracts, EBCC-13
follow up (fup) time of 20 mo (range 3–63) PFS was 27.9 mo. In ET resistant pts (73.5%) in the iCDK4/6 pts and MRM resistant pts was 30 mo. The median overall survival (OS) was not reached. The 12 and 36 mo OS rate were respectively 94% and 70%. Subsequent treatment data were available for 34 pts. The most commonly prescribed regimens were metronomic chemotherapy with vinorelbine and capecitabine (29.4%) and everolimus/oxemestane (29.4%). The TTP on II line therapy was 6.2 mo.

Conclusions: In our review abemaciclib was predominantly prescribed in ET resistant while ribociclib in ET sensitive pts. With a median fup of 20 mo we found a high pFS in ET sensitive and ET resistant population similar to pooled median PFS of randomized controlled trials (RCTs) and Real world data already published. Dose reduction (59.8%) and CDK4/6 discontinuation rate due to toxicity (12.8%) were slightly higher than those in the RCTs (31–55% and 4–10% respectively). These may be associated with poor patient related prognostic factors. Further real world data are warranted.

No conflict of interest.

212 (PB-036) Poster
Assessing the application of multidisciplinary management of locally advanced breast cancer in Egyptian female patients at Alexandria surgical oncology unit
G. AbouElnageah 1, Alexandria Faculty of Medicine, Surgical Oncology Unit, General Surgery department, Alexandria, Egypt

Background: Breast cancer is a major public health problem. Locally advanced breast cancer (LABC) has a clinical challenge due to distant metastasis occurs in most patients, and they may relapse and eventual death. Multidisciplinary Team (MDT) like tumor board is an integral part of cancer care. It reduces surgical interference in the presence of hormonal and chemotherapeutic agents.

Aim of the work: Identify the role of multidisciplinary team in the management of locally advanced breast cancer as regards; Rate of application of multidisciplinary team, the use of neoadjuvant chemotherapy, breast conserving surgery, modified radical mastectomy (MMR) and breast reconstruction, effect of radiotherapy on breast with different types of breast reconstruction and progression free survival and overall survival.

Patients and methods: A retrospective study applied on Egyptian female patients with LABC presented to Alexandria clinical oncology and surgical oncology departments and divided into two groups; group1: patients not managed by MDT (not presented in tumor board) and group 2: patients managed by MDT (presented in tumor board).

Results: 352 patients were included in the study, 187 were included in the tumor board and managed by MDT and 165 were not included in the tumor board. Rate of use of Neoadjuvant chemotherapy in the group included in MDT is higher (27.8%) than the other group (21.2%). Rate of MRM is higher (30.5%) in group 2 than the other group (13.5%) and higher than rate of MRM (61.5%) in group 2 in relation to group 1 which is 13.5% for BCS and 71.5% (p = 0.01). Metastasis is less (17.6%) in group 2 than the other group (22.5%) and local recurrence is also less in group 2 (7%) than the second group (14.5%) (P = 0.02).

Conclusion: MDT management for LABC is proved to decrease major surgery rate, metastasis of the disease and local recurrence of the disease.

No conflict of interest.

213 (PB-037) Poster
Advanced breast cancer journey: a consensus guidance from a multidisciplinary panel for improving clinical practice in Portugal
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Background: With the increased experience of a Hospital Center and the availability of new drugs, the management of patients with advanced breast cancer (ABC) is changing. The current consensus guidance aimed for the Portuguese oncology departments and divided into two groups; group1: patients not managed by MDT (not presented in tumor board) and group 2: patients managed by MDT (presented in tumor board).

Results: 352 patients were included in the study, 187 were included in the tumor board and managed by MDT and 165 were not included in the tumor board. Rate of use of Neoadjuvant chemotherapy in the group included in MDT is higher (27.8%) than the other group (21.2%). Rate of MRM is higher (30.5%) in group 2 than the other group (13.5%) and higher than rate of MRM (61.5%) in group 2 in relation to group 1 which is 13.5% for BCS and 71.5% (p = 0.01). Metastasis is less (17.6%) in group 2 than the other group (22.5%) and local recurrence is also less in group 2 (7%) than the second group (14.5%) (P = 0.02).

Conclusion: MDT management for LABC is proved to decrease major surgery rate, metastasis of the disease and local recurrence of the disease.

No conflict of interest.

214 (PB-038) Poster
Advanced breast cancer treatment after CDK4/6 inhibitors - the experience of a Hospital Center
M. Costa 1, A.C. Valente 1, M. Freitas 1, C. Almeida 1, N. Tavares 1, D. Almeida 1, C. Caeiro 1, I. Augusto 1, I. Sousa 1, M. Barbosa 1, Centro Hospitalar e Universitário São João - Porto, Medical Oncology, Porto, Portugal

Background: Optimal treatment after progression under CDK4/6 inhibitors (CDK4/6i) is not yet defined, although studies are underway. The objective of this work was to evaluate the effectiveness outcomes of subsequent line to iCDK4/6 treatment in our population.

Material and methods: Clinical data of patients diagnosed with advanced breast cancer treated with CDK4/6 for ≥1 month, were retrospectively analyzed between February 2017 and July 2020 (n = 78), and divided in 2 groups (A: patients treated with iCDK4/6 in 1st line and B: treated in 2nd or more lines). Time to treatment failure (TTF) was defined as the time period between initiation of treatment with iCDK4/6 and its discontinuation. The time to subsequent line treatment failure (TTF2) was defined as the time period between initiation of treatment with iCDK4/6 and its discontinuation. Clinical benefit of the subsequent line to iCDK4/6 was assessed and defined as stable disease for ≥6 months. The statistical analysis was performed using the SPSS® software (V27).
Results: All patients were female. In group A (n = 55), the median age at onset of ICBDK-6 was 54 years [29–85]. The median FU was 22 months [2–48]. In 32.7% of patients (n = 18) Palbociclib (P) was associated with an inhibitor of aromatase (AI) and 32.7% to fulvestrant (F). Treatment was suspended in 58.2% (n = 32) of patients. The median TTF1 was 28 months [95%CI 18.2–37.8]. After discontinuation of ICBDK-6 suspension 36.4% of patients (n = 20) were proposed for chemotheraoy alone (CTm), 9.1% (n = 5) for hormone therapy alone (HTm), 9.1% for everolimus-exemestane (EE) and 3.7% (n = 2) died before initiation subsequent therapy. The median TTF2 for CTm was 6 months [95%CI 4.1–7.59], 5 months for HTm [95%CI 0.00–11.53] and 8 months for EE [95%CI 3.20–12.80]. The clinical benefit rate (CBR) of CTm was 50% (n = 10), of HTm of 40% (n = 2), as well as EE (40%). Regarding deaths, half (n = 10) of patients on mCT, 1/5 of those on E and 2/5 of those with treated with HT died. In group B (n = 23), the median age at onset of ICBDK-6 was 61 years [28–76]. The median FU was 20 months [4–43]. The P+F association was prescribed in most patients (87%). Treatment was suspended in 73.9% (n = 215) of patients. However, the retrospective study design, the small sample size and the heterogeneous population, do not allow definitive conclusions to be drawn.

No conflict of interest.

216 (PB-040) Poster
AI-based smartphone App using a single-leading ECG for automated QTc diagnostics in oncology

C. H. Tonk1, 2, T. Schinkothe1, 2, N. Harbeck3, V. Carmelo4, J. Guimarães Feliciano5, R. Wuerstein6, S. Kümmer6, A. Schütz7, 1University of the Bundeswehr Munich, Institute for Sports Science, Neubiberg, Germany; 2CANKADO GmbH, Digital Health, Ottobrunn, Germany; 3Comprehensive Cancer Center of the Ludwig-Maximilians-University, Department of Gynecology and Obstetrics, Munich, Germany; 4Hospital da Luz, Cardiology Department, Lisboa, Portugal; 5Hospital Cruz Vermelha, Heart Center, Lisboa, Portugal; 6Klinikum Eissendorf, Breast Unit, Essen, Germany; 7University of the Bundeswehr Munich, Research Center for Digitization of Health Care, Neubiberg, Germany

Introduction: Long QT syndrome is a common cardiac toxicity side effect of various anti-tumor drugs. Previous cardiological monitoring on oncological patients is primarily complex and requires for non-internal oncologists a consultation. Therefore, the QTc-Tracker smartphone APP was developed, which enabled a tele-cardiological diagnosis of the QTc time with standard ECG analysis. As a result, diagnosis times could already be reduced by 99%. The further development examined an automatic determination of the QT time using the smartphone APP. However, since single-lead ECG devices are regulated, no new regulation threshold value. This artificial intelligence-based smartphone APP is not intended to replace the cardiological diagnosis, but it can simplify routine processes and help to decide which patients need a cardiological examination more urgently.

Conflict of interest:
Ownership: Timo Schinkothe: Owner and Managing Director of CANKADO GmbH. Other Substantive Relationships: Christian Horst Tonk: Employee of CANKADO GmbH.

217 (PB-041) Poster
Prospective, Multi-Center, Artificial Intelligence Study for Early Prediction of Serious Events under Treatment Is Now Open for Recruitment in Breast Cancer - OMCAIT Trial in Progress

C. H. Tonk1, 2, R.E. Kates3, S. Kümmer1, F. Cardoso4, T. Schinkothe5, 2, N. Harbeck5, P. Stabi6, A. Schütz1, 1University of the Bundeswehr Munich, Institute for Sports Science, Neubiberg, Germany; 2CANKADO GmbH, Digital Health, Ottobrunn, Germany; 3Champalimaud Clinical Centre/Champalimaud Foundation, Breast Unit, Lisboa, Portugal; 4Comprehensive Cancer Center of the Ludwig-Maximilians-University, Department of Gynecology and Obstetrics, Munich, Germany; 5St. Antonius Hospital Eschweiler, Department of Hematology and Oncology, Eschweiler, Germany; 6University of the Bundeswehr Munich, Research Center for Digitization of Health Care, Neubiberg, Germany

Background: Aim of the OMCAIT trial (‘One Million Cancer Treatment manner’; NCT04531995) is improvement of cancer patient care and safety by developing artificial intelligence (AI)-based, incident prediction algorithms. Incident detection allows early notification of treatment teams, enabling timely management changes or interventions. Ultimately the algorithms can
also support improved health resource allocation. This trial in progress aims to provide learning databases in breast cancer comprising both electronic patient reported outcome (ePRO) data using the mobile medical device ‘CANKADO PRO-React’ and ground truth outcome data, which provide disease-specific events of interest (“Incidents”) verified by the physician (e.g., during patient examinations).

Methods: Incident prediction is posed as an application of stochastic time series analysis using AI and knowledge engineering technology. The learning process begins by fitting individualized and disease-specific stochastic process models to “incident-free” intervals extracted from the ePRO data series. Incidents produce detectable deviations from “ordinary” ePRO fluctuations. The algorithms are trained on CANKADO PRO-React data to produce real-time risk functions for predicting incidents on a clinically specified time horizon.

Results: Considering the heterogeneity and combinatorics of diseases, stages, therapies, and types of events considered in this study, ultimately the AI algorithms aim to discover about 360 distinct predictive relationships. The estimate of one million treatment months is derived from statistical power analysis of this target, considering estimated median documentation time of six months per patient and estimated 400–500 patients per predictive relationship. To date, 45 centers in Germany have expressed interest in participating. This participation level will enable proof of principle. Ethics votes are already available in most regions. Other centers are invited to participate in this trial.

Conclusions: OMCAT opens a whole new path towards evidence-trained AI and a novel combination of patient observation and predictive care. The goals of OMCAT are ambitious and will therefore require many more supporters.

Conflict of interest: Ownership: Timo Schinkothe: Owner and Managing Director of CANKADO GmbH. Other Substantive Relationships: Christian Horst Tonk: Employee of CANKADO GmbH.

Impact of subcutaneous versus intravenous administration of pertuzumab and trastuzumab (PH) for the treatment of HER2-positive breast cancer in Montenegro

N. Cicmil Saric1, S. Lekic1, J. Lakicevic1, V. Todorovic1. 1Clinical Center of Montenegro, Institute of Oncology, Podgorica, Montenegro

Background: Both PH are approved for use in patients with HER2-positive breast cancer and are available as intravenous formulations (PH IV) and subcutaneous fixed-dose combination of both drugs (PH FDC SC). SC formulations showed similar efficacy as IV counterparts, providing additional economic value to patients, physicians and health systems due to shorter administration and observation time.

Material and methods: Based on the average number of PH doses, both IV and SC, given per year per patient, we calculated potential time savings for patients, medical staff, and capacity utilization of the institution. We calculated potential savings if PH FDC SC were to be given in regional hospitals (secondary care) instead the Clinical Center of Montenegro (CCM) which is the only institution where breast cancer patients can receive oncology treatment. The analysis was based on 61 patients treated with PH.

Two methods were used for analyses: questionnaires filled out by patients and interviews with medical staff, by comparing the application protocols of PH IV and PH FDC SC simulating a time and motion study. The basis for the calculation of savings in patient transport is the GIS model (Geographic Information System) based on the residence of each patient and the address of the gravity tertiary center.

Results: The results showed that switching from IV to SC administration of PH would shorten the administration time per patient by 21 minutes. Annually, patients would spend over 160 days less in a chemotherapy unit. The cost of a hospital chair utilization is 1,04 EUR per minute, which leads to the conclusion that switching to SC could save up to 240,000 EUR yearly. On the patients side, the time lost in transport would be significantly reduced (85 days/year), as well as the time spent in the hospital to receive therapy (each patient would save 63 hours annually).

Conclusion: SC formulation of PH is associated with favorable pharmacoeconomic outcomes generating significant non-drug cost savings for healthcare providers through time savings and other benefits. For patients PH FDC SC could save a significant amount of time by enabling treatment closer to their homes through decentralization of oncology treatment.

Conflict of interest: N. Cicmil Saric: Advisory Board: Roche, Novartis, MSD; Other Substantive Relationships: Speakers: Roche, MSD, Astra Zeneca, PharmaSwiss, Pfizer.

S. Lekic: Advisory Board: Roche, Novartis, MSD; Other Substantive Relationships: Speakers: Roche, Astra Zeneca, Astellas, MSD, PharmaSwiss, Pfizer.
J. Lakicevic: Advisory Board: Roche, Novartis, MSD; Other Substantive Relationships: Speakers: Roche, MSD, Novartis, Astellas, PharmaSwiss, Pfizer.
V. Todorovic: Advisory Board: Roche, Novartis, MSD; Other Substantive Relationships: Speakers: Roche, MSD, Astra Zeneca, Astellas, PharmaSwiss, Sanofi, BMS.

219 (PB-043) Poster
Trained Artificial Intelligence (AI) for Predicting Therapy Discontinuation Based on Patient Observations in Advanced Breast Cancer

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Background: In various fields outside of medicine, AI-supported systems have been established that can predict an event without previous knowledge of such systems is to detect events earlier and, if necessary, to be able to prevent them. In medicine, it would be particularly interesting to be able to make such predictions based solely on patient observations.

Methods: The usage from 323 patients with advanced breast cancer with a total of 78,542 documentation days was used. In addition, the premature termination of use was defined as an undesirable event. The data was then processed and annotated. A deep-learning neural network (NN) classifier was trained on this dataset independently on all documented days to predict this target endpoint. The patient classifier score was computed by averaging over daily scores. Overall classifier accuracy and binary cross entropy loss were computed as performance indicators on training and test data sets (2:1 split).

Results: After tuning the hyperparameters, the best-performing NN comprised three hidden layers, each with 88 neurons, providing additional economic value to patients, physicians and health systems due to shorter administration and observation time.

Material and methods: Based on the average number of PH doses, both IV and SC, given per year per patient, we calculated potential time savings for patients, medical staff, and capacity utilization of the institution. We calculated potential savings if PH FDC SC were to be given in regional hospitals (secondary care) instead the Clinical Center of Montenegro (CCM) which is the only institution where breast cancer patients can receive oncology treatment. The analysis was based on 61 patients treated with PH.

Two methods were used for analyses: questionnaires filled out by patients and interviews with medical staff, by comparing the application protocols of PH IV and PH FDC SC simulating a time and motion study. The basis for the calculation of savings in patient transport is the GIS model (Geographic Information System) based on the residence of each patient and the address of the gravity tertiary center.

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Conclusion: SC formulation of PH is associated with favorable pharmacoeconomic outcomes generating significant non-drug cost savings for healthcare providers through time savings and other benefits. For patients PH FDC SC could save a significant amount of time by enabling treatment closer to their homes through decentralization of oncology treatment.

Conflict of interest: Ownership: Timo Schinkothe: Owner and Managing Director of CANKADO GmbH. Other Substantive Relationships: Christian Horst Tonk: Employee of CANKADO GmbH.

220 (PB-044) Poster
Non-Inflammatory skin involvement in Breast Cancer (T4b): Real-world Data from a Tertiary care centre in Eastern India

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Background: Breast cancer patients with skin ulcerations, satellite nodules or peau d’orange at presentation are classified with stage IIIb breast cancer (T4b) as per AJCC 8th edition. Neoadjuvant chemotherapy (NACT), followed by Modified radical mastectomy (MRM), is the commonly accepted treatment in such patients. For fear of adverse outcomes with breast conservation surgery (BSC) and uncertainty over sparing initially involved skin irrespective of the response to chemotherapy, identifying patients with skin resolution post-NACT can help surgeons in decision-making.
Materials and methods: Data was analysed from a prospectively maintained departmental database. Patients with inflammatory breast cancer and those who underwent upfront surgery were excluded. A total of 97 patients with non-inflammatory skin involvement were analysed.

Results: The mean age of the whole cohort was 47.7 (± 10.6) years. The majority of the patients (68.8%) received anthracycline-based regimen. The majority of the patients showed resolution of dermal skin involvement post-NACT (n = 85, 87.6%), with 14 patients achieving complete pathological response (PCR).

No conflict of interest.

221 (PB-045) Poster

Lobular carcinoma of the breast and response to targeted therapy with CDK4/6 inhibitors – a single Portuguese center experience

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Background: Invasive lobular carcinoma (ILC) represents 5–15% of all BC, and has a different biological behaviour from invasive ductal carcinoma (IDC). Clinical trials (CT) in luminal metastatic BC (mBC) have demonstrated the benefits of hormonal therapy (HT) + IC4D/6 combinations in survival. Data on the magnitude of clinical benefit in ILC mBC is scarce. The aim of this study is to evaluate the response of ILC mBC to HT+iCDK4/6 combinations.

Materials and methods: A single-center retrospective study was performed on mBC patients (pts) with a lobular histology initiating iCDK4/6 therapy in our center, between Jan-2019 and Jan-2022. Data was collected from the medical records. Mixed histologies with lobular features were included. The data cut-off date was 18 Aug-2022.

Results: Of the 270 patients (pts) who initiated therapy with iCDK4/6 33 (12.2%) had a lobular or mixed lobular histology. All 33 were female. Median age at diagnosis of mBC was 61. PS ECLOG was 0/1 in 27 pts (81.8%). Clinical stage II in 9 pts (27.3%), III in 14 pts (42.4%) and IV in 10 pts (30.3%). Median disease free interval was 80 months. Most pts (n = 25, 75.8%) had prior adjuvant HT. 18 pts (54.5%) had no visceral disease 10pts (30.3%) bone only metastasis, 15pts (45.4%) visceral disease. The most used IC4D/6 was Palbociclib (19), ribociclib (11) and abemaciclib (3). 18 pts were treated in 1st line with an aromatase inhibitor (AI)+IC4D/6 combination, and 15 pts with fulvestrant+ICD4K/6 combinations on 2nd and further lines. In the AI +CDK group, after a median follow up (FU) of 12.5 months, mean PFS was 13.2 months (0.4–26.3) (median not reached). In terms of BOR to treatment 6 had SD, 3 PR, 1 CR and 1pt had PD. At the cut-off, 7 pts are still under treatment, 7pts progressed and 1 pt discontinued due to unacceptable toxicity; and 2 pts died due to BC.

Conclusions: IDC usually associates with better prognosis. However, data about the efficacy of HT + IC4D/6 combinations in this subtype is scarce. Our cohort is therefore very informative, despite the retrospective design and short follow up. In the 2nd and further line setting with a median FU of 12 months, the Fulv+CDK combinations show a PFS of 10 months that has not yet reached the median. This is in line with the data from seminal CT. In the 1st line setting where longer survivals are expected, a longer FU is warranted to draw conclusions. It is clear the high clinical benefit drawn from these combinations in ILC.

No conflict of interest.

222 (PB-046) Poster

Shared decision-making in breast cancer care: Evidence from a scoping literature review and a survey across breast units in Europe

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Background: Shared decision-making (SDM) is defined as a process of collaboration between patients and clinicians to reach a joint decision about care which accounts for patient preferences and values. This study aims at investigating SDM implementation barriers and enablers, and mapping the adoption and diffusion of SDM tools across Breast Centres in Europe.

Materials and methods: We performed a scoping review of scientific and grey literature to analyze the strategies that support SDM and decision aids (DAs) adoption in breast cancer (BC) clinical practice. Findings were interpreted based on the Practical, Robust Implementation and Sustainability Model (PRISM), an implementation science framework. The scoping review informed the development of a survey administered to specialists in Europe through BC networks and focused on patient-clinician communication approaches, availability and use of DAs, their barriers and enablers.

Results: The results from the analysis of 82 papers show a rise in interest toward SDM in BC care over time, with more than 50% of studies published since 2018, mostly (59%) in non-European countries. DAs are usually digital tools, although paper-based solutions remain relevant. The table below summarizes the key barriers and enablers to SDM implementation.

No conflict of interest.
The survey is running as late as August 2022. Preliminary results show that amongst 280 respondents, roughly 50% report that DAs are available in their organization and/or country. The most commonly used tools are still paper-based.

Conclusions: The availability of SDM tools does not automatically translate into actual use in a clinical context. Factors related to user-centred development, team attitude and experience, organisational support and reorganisation of clinical pathways influence the adoption of SDM strategies. These findings will support the design of a feasibility evaluation of a digital DA in the metastatic setting.

Our work will contribute to raise awareness on the importance of SDM and to educate BC specialists on the benefits of using DAs, hopefully informing future updates of clinical guidelines at the national and international level.

Acknowledgment: This study is part of the ShareView project, funded by Pfizer Global Medical Grants with Sharing Progress in Cancer Care

No conflict of interest.

223 (PB-047) Poster Utility Of Telephone-Based Psychological Support Among Breast Cancer Patients During Covid-19 Pandemic: An Observational Study

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Purpose: Telephone-based support could provide an effective and more flexible option for delivering psychological support. The present study aimed to investigate the feasibility and utility of a telephone-based psychological intervention for advanced breast cancer patients referred to palliative medicine department.

Methods: A single-centre randomized observational design was conducted on 610 adult advanced breast cancer patients referred to palliative medicine department between April and December 2020. Intervention group received additional 4 telephone-based psychotherapy sessions as compared to standard routine palliative care in the control group. Patients were followed up weekly for 1 month. Primary outcomes measured were: anxiety, depression, and psychological well-being.

Results: Most patients reported higher levels of anxiety, depression and lower psychological well-being at baseline. Patients assigned to the intervention group had statistically significant improvement in their psychological symptoms at all study time points as compared to their control group counterparts (p < 0.005).

Conclusion: Results from our study provide preliminary support concerning the feasibility and utility of telephone-based therapy for advanced breast cancer patients. Further research examining factors influencing the outcomes of telephone-based psychological support is needed.

No conflict of interest.

224 (PB-048) Poster Exploring the impact of metastatic breast cancer support group in Nigeria

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Introduction: Over 70% of breast cancer patients in Nigeria present metastatic/advanced breast cancer (MBC). An estimated 90% of breast cancer deaths are as a result of metastatic disease, either at diagnosis or recurrence[]. MBC is associated with severe burden to the patient, family, healthcare delivery system and the society at large[]. Women living with MBC face many challenges ranging from poor access to MBC information, untreated pain, frequent break-down of radiotherapy machines and absence of peer support.

Method: In this research, we set up the first metastatic breast cancer support group in Abuja. The group meet once every month on a face-to-face basis and also uses WhatsApp Group for regular meaningful engagement. We explored the impact of the group on the patient’s quality of life (QoL) using a focused group discussion (FGD). Eighteen (18) patients participated in the two sessions of FGD.

Result: Many of the patients report that the support group provides a culture of love and strength over their death anxiety, especially meeting other patients who have lived with MBC longer. They also report to have found peer support on the online WhatsApp Group.

No conflict of interest.

Reference

225 (PB-049) Poster Home based care for terminal cancer patients: study from rural part of India

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Introduction & Aim: Cancer is one of the common causes of death worldwide after heart disease. Home care of the terminal cancer patients is very difficult and various challenges during their terminal stage. Our goal is to give a pain free good quality of life in these advanced stage cancer patients. Objective of this study is to identify the main difficulties in achieving the above goal in a rural village setting in India.

Method: This study was conducted for a period of one year in MAS Clinic & Hospital, India with the informed consent of the study population. This was a qualitative exploratory study design via randomized way of selected 100 terminal cancer patients. Half of the patients received treatments with the help of family members only. And another half received treatment by trained volunteers and nurses by regular home visit. Data were collected through focus group discussions and group interviews. And data were analyzed by content analysis in two separate groups.

Results: Basically we focused on few major problems i.e. pain, nausea, vomiting, constipation, mobility problem, and bed sore problem. These all three problems are lesser to that group who received care by trained volunteers rather than family members.

Conclusion: This study can provide quality of life of these terminal cancer patients at their own home. And if we give basic training to family members that will be more benefited of these patients and ultimately enhances quality of life and reduce caregiver’s burden.

No conflict of interest.

226 (PB-050) Poster Racial disparity and time to treatment initiation effects on survival differences in breast cancer: a DAGs-based review protocol for a systematic review of cohort studies

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Background: Racial disparity is a fundamental predictor of many poor health outcomes, including in breast cancer. There is a need to synthesize knowledge on the impact of variations in race/ethnicity and initiation of treatments on health-related outcomes to support mitigating interventions; however, in the literature, there are various ways the causation between racial disparities and outcomes is conceptualized, and the implications of different studies depend strongly on these different conceptualizations. The aim of this protocol is to systematically review the existing evidence on racial/ethnic disparities in initiation of treatments and their impact on breast cancer patients’ survival in the U.S, and develop causal models to describe the ways in which the research community conceptualizes the causal associations between racial disparities and these outcomes.

Methods: A comprehensive systematic search of databases including PubMed, Ovid, Web of science, and the Cochran library will be performed, along with a title search on Google Scholar, to identify relevant literature. The process will follow PRISMA guidelines. The review will include studies of cohorts of female breast cancer patients who were diagnosed with stage I-III in the US. The ROBINS-I risk of bias tool will be applied and studies with either low or moderate risk of bias will be included in the review. A Directed Acyclic Graph (DAG)-based appraisal will be used to describe the causal effects of race/ethnicity on delays to treatment and survival assumed by each study, and to create a consensus causal model that aggregates these associations across the identified studies. The evidence synthesis for constructing directed acyclic graphs (ESC-DAGs) method was used to create a DAGs based checklist.

Results: As part of the protocol, a workflow was created to build causal DAGs that summarize causal associations in the literature. Based on the final checklist, five main steps are required to generate the DAGs in retrospective cohort studies: create a specific DAGs for every study, create a combined DAG which describes the existing literature, modify and/or simplify the DAGs using established causal criteria, and visualize the resulting DAGs.

Conclusion: This systematic review will summarize knowledge about the impact of racial disparity on breast cancer survival considering delays in receiving treatments as a mediator, and will explicitly describe the causation underpinning this knowledge. Future directions will be identified to address
existing gaps potentially relevant to creating equity for racial and ethnic minority groups. The results can help health authorities to take action to alleviate inequity in marginalized groups at population level.

No conflict of interest.

227 (PB-051) Poster
Living with the unknown: The experience of Cypriot individuals living with BRCA 1/2 mutations
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Background & context: Breast cancer is the most common type of malignancy in Cypriot women, with approximately 600 new cases diagnosed each year. Approximately 5 to 10% of these diagnoses are a result of a mutation in the BRCA 1/2 genes. Genetic testing for breast cancer predisposition has been available in the clinical practice for more than 20 years now. Since genetic information disclosure, following this type of tests, involves a language of possibilities and not certainties, complex distress issues may occur. However, limited attention has been given to the experience of BRCA mutation disclosure. The project recognises the research gap regarding documenting and understanding the needs of individuals living with BRCA mutations, and therefore aims to provide an insight into these experiences. The way an individual experiences a clinical diagnosis may be closely linked to their cultural background, therefore it is important to gather and analyse data separately for the Cypriot population. Currently, no other studies have investigated the experience of Cypriot individuals living with BRCA 1/2 mutation.

Methods: The data obtained, through individual interviews, will be analysed qualitatively. It is expected that they will provide useful insights into what it is like to be a Cypriot citizen living with a BRCA mutation. The project is organised and implemented by establishing a co-operation between researchers from Europa Donna Cyprus, the Cyprus Institute of Neurology & Genetics and major oncology hospitals.

Expected Outcomes: Through the dissemination of the data obtained, we are hoping to provide a fuller picture of the experience of BRCA 1/2 affected individuals living in Cyprus and depict the ways it might be affecting their lives. The acquired knowledge might help genetic counsellors, researchers, and healthcare professionals obtain a better understanding of the implications of germline mutations. This in turn may contribute to the development and integration of ongoing multi-disciplinary psychosocial support services and effective interventions for BRCA affected families. Moreover, the data obtained can be translated into educational materials/lectures on cancer genetic testing so that individuals can feel empowered to make educated, informed health choices. In addition, this new information might serve as strong leverage in advocating and lobbying to influence social policy makers to take necessary actions and adjust national strategies in relation to genetic testing and breast cancer. Finally, this project highlights the importance of setting up a national reference centre for BRCA mutations and other cancer genetic diagnoses, offering services tailored to the needs of the Cypriot population.

No conflict of interest.

228 (PB-052) Poster
Breast cancer and pregnancy: about a series of cases and review of the literature
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Background: Pregnancy-associated breast cancer is a rare entity. Its prognosis is overall poor because of the young age of onset and the diagnosis is often related to gravidic breast changes.

Materials and methods: We studied 9 cases of pregnancy-associated breast cancer collected at the Maternity Hospital of Sousse. We compared our results with those of the literature and tried to identify the particular points of this management, and specify the prognosis of this association.

Results: The mean age of our patients was 33 years with extremes of 24 and 44 years. The mean parity was 1.7. The tumor was classified T1 in 4 cases, T2 in 3 cases and T3 in 2 cases. The axillary lymph nodes were palpable in 4 cases. Mammmography was performed in 100% of cases. In our series there were 6 therapeutic terminations of pregnancy and only 3 pregnancies were carried to term.

Conclusion: Pregnancy-associated breast cancer is often discovered late compared to the general population with a larger tumor size and lymph node metastasis in 89% during pregnancy compared to 55% in the general population.

No conflict of interest.

229 (PB-053) Poster
COVID-19, breast cancer care, and social determinants of health: a cross-sectional study to investigate the impact of a pandemic on health and health care
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Purpose: The aim of this study is to understand the immediate impact on overall health and health care utilisation for women living with and beyond breast cancer (LBWC) specific to breast cancer during COVID-19, and whether the impact varied by social determinants of health (SDH).

Methods: This cross-sectional study included women living in Ireland and diagnosed with breast cancer (BC) in the past five years and was conducted from September 2020 to April 2021 (during the period of COVID-19 restrictions). Chi-Square tests and multivariate regression analyses were used to measure associations between predictors (COVID-19 impact, SDH, clinical characteristics) and outcomes (disrupted health services and quality of life).

Results: There were n = 387 responses and 30.5% of women reported a high COVID-19 impact, which was significantly asser with age, region, and employment status. 54.5% of women reported disrupted breast cancer (BC) care. In multivariable analyses, younger women, women in post-active treatment, and women further removed from their initial BC diagnosis reported significantly more disruption to BC care. Also, women who reported a high COVID-19 impact reported significantly lower quality of life (QoL) scores; women of younger age and non-employed also reported significantly lower QoL scores.

Conclusion: The COVID-19 pandemic has significantly impacted women LWBC in Ireland which varied by SDH including age, region, and employment status. Further research is needed to understand the long-term impact of the pandemic on women LWBC and how the health system in Ireland specific to BC has responded to COVID-19.

No conflict of interest.

POSTER SESSION 18 November 2022
Basic Science and Translational Research

230 (PB-054) Poster
GC-MS based untargeted approach reveals metabolic perturbation in Tamoxifen resistant breast cancer cells
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Background: Breast cancer is the most common cancer among females. The estrogen receptor (ER) is expressed in approximately 70% of breast tumors. Tamoxifen is an ER antagonist that is used as adjuvant therapy in the treatment of ER-positive cancers. Approximately 40% of patients develop tamoxifen resistance during treatment. The metabolic state of cancer cells dictates how responsive they are to chemotherapy, and cancer cells can rewire their metabolism to produce resistant phenotypes. We aim to identify altered metabolites and associated pathways in tamoxifen-resistant (TAMR) breast cancer by using gas chromatography-mass spectrometry (GC/MS).

Materials and Methods: Metabolites were extracted from human MCF7 and MCF7-TAMR cells in methanol-methanol-water by repeated freezing and thawing. Methoxime hydrochloride in pyridine reagent was used to treat the dried supernatant before MSTFA + 1% TMCS reagent was used for derivatization. An untargeted GC/MS method was developed and optimized.
M SDSial was used for all data preprocessing steps, and the Kovats retention index and GC/MS library search were used to identify metabolites. The Metaboaanalyst online tool was used for statistical analysis.

Results: A total of 201 metabolites were identified using library search, of which 70 were found to be significantly different between two cell lines using t-test analysis. The fold change analysis revealed that in TAMR cells, 29 metabolites were upregulated and 36 metabolites were downregulated. The metabolites that are upregulated in TAMR cells include N-acetyl-D-glucosamine, N-acetyl-D-hexosamine, lysine, uracil, citrulline, tyrosine, alanine, glycine, acid, and α-phosphoserine, whereas those that are downregulated are hydroxyproline, threonine acid, lactose, oxoproline, glutamine, α-phosphothanolamine, oxoglutaric acid, and N-acetyl-L-aspartic acid. We also identified metabolic pathways that significantly differ between the two cells, including amino sugar and nucleotide sugar metabolism; histidine metabolism; Vitamin B6 metabolism; nicotinate and nicotinamide metabolism; pantothenate and CoA biosynthesis; and citrate cycle.

Conclusions: This study revealed dysregulation of various metabolic processes in TAMR cells, which may be crucial in elucidating the molecular basis of the mechanisms underlying acquired tamoxifen resistance.

No conflict of interest.

231 (PB-055) Poster
A study of the anti-proliferative and anti-migration effects of polyphenol compounds in Maltese extra virgin olive oil on different breast cancer cell lines
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Background: According to statistical data the incidence of breast cancer worldwide has been increasing annually. Despite therapeutic advances in conventional and targeted therapies, the 5-year survival rate of stage IV is less than 29%. In addition, adverse events caused by the combination of current therapies often have an impact on a patient’s quality of life. Phenolic compounds have been studied as alternative therapies showing anti-proliferative and pro-apoptotic effects in colorectal, ovarian, and breast cancer, and have also shown cell differentiation-inducing effects in leukemia cells according to previous studies conducted by our research team. Therefore, in this study we evaluated the effect of Maltese-derived phenolic compounds (EVOOs) on a variety of Oestrogen and Progesterone receptor-positive and triple-negative breast cancer epithelial cell lines.

Material and methods: MDA-MDA-231, MCF-7, BT549, HCC1806, HCC1937, and HCC70 cell lines were used for the different assays. The effects of phenolic compounds such as hydroxytyrosol, pinoresinol, oleacein, and a fourth compound identified as Peak 4 were evaluated by performing proliferation assays, cell viability, wound healing assays, and cytotoxicity assay. The data was analysed using Prism 8.0 software. Anova test and t-test were performed for statistical analysis where p < 0.05 was considered statistically significant.

Results: Peak 4 and hydroxytyrosol decrease cell viability significantly by up to 90% in MDA-MD-231 and MCF-7 cell lines. These compounds show promising anti-proliferative behaviour in MDA-MD-231, MCF-7 and BT549 cancer lines, providing IC50 values of 39 parts per million (ppm) and 36 ppm respectively. Moreover, they show potential anti-migratory activity compared to control for the MCF7 cell line (p = 0.006 and 0.019) and for the BT549 cell line (p = 0.003 and 0.034) respectively.

Conclusions: The results of this study suggest that Peak 4 and Hydroxytyrosol exhibit antiproliferative and anti-migratory activity in certain triple-negative breast cancer cells or in cells expressing Oestrogen and Progesterone receptors.

No conflict of interest.

232 (PB-056) Poster
Co-expressing genes with TACSTD2 and interacting microRNAs in patients with recurrent luminal breast cancers
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Background: Previous studies showed that high expression of the Trop-2 gene, TACSTD2, is associated with higher cyclin D1 levels, lymph node and distant organ metastases in breast cancer. It would be interesting to investigate the interacting microRNAs and co-expressing genes with TACSTD2 in recurrent luminal breast tumors.

Material and methods: We downloaded the miRNA and gene dataset for breast cancer from the TCGA with 361 and 76 recurrent cancer and normal tissue samples, respectively, and sorted the dataset pinpointing recurrent luminal A breast cancer (N = 111). We calculated differentially expressed miRNAs and genes (DEGs) between recurrent vs. normal tissue and recurrent vs. non-recurrent tumors. We investigated all the miRNAs or genes that correlate moderately to strongly with TACSTD2 in recurrent breast tumors, taking 0.4 as the cut-off. Genes of interest were queried in the CRISPR-Cas9 viability screening database DepMap for the gene effect scores in luminal breast cancer cell lines. Pathway analysis was adopted with NDEx Integrated Query, ver 1.3.1 (UC San Diego) for functional characterization.

Results: Using the edgeR analysis of the differentially expressed miRNAs and DEGs, we discovered that mir-125b-1 was significantly down-regulated in the recurrent breast tumors than in the normal tissue (Log2FC = −1.267, P-value = 1.45e-24). Furthermore, we computed the correlation of mir-125b-1 and TACSTD2 in the recurrent tumor samples, which disclosed a positive but weak correlation (Spearman correlation = 0.157, P-value = 0.0028). Differential expression analysis of the recurrent tumors versus normal for other miRNAs from miRTarBase revealed overexpression of mir-942 (false discovery rate (FDR) = 1.12e-12) and depletion of mir-495 in recurrent tumors (FDR = 1.98e-05). We found two genes, AQP5 and LINC00052, differentially co-expressed strongly with TACSTD2 in recurrent tumors compared to the non-recurrent luminal A breast cancers. AQP5 was positively correlated (correlation = 0.446; p = 6.667e-7), whereas LINC00052 was negative correlated with TACSTD2 expression (correlation −0.5; p = 1.53e-6). The interesting non-coding RNA, LINC00052, has been reported as a tumor suppressor. We queried the CRISPR-Cas9 viability screening database DepMap, which showed that AQP5 acts as a tumor suppressor, evidenced by the gene effect scores by DEMETER2 in six luminal A breast cancer cell lines. STRING and NDEx database analysis showed that AQP5 would interact with SRC and STX4.

Conclusions: TACSTD2 co-expressing AQP5 and LINC00052 and their interactions with STX4 and SRC could be interesting in further understanding Trop-2 positive luminal breast cancers in the relapsing state. Overexpression of mir-942 and depletion of mir-495 in recurrent tumors also require further experiments for validation.

No conflict of interest.

233 (PB-057) Poster
Serum methylmalonic acid concentrations at breast cancer diagnosis are not associated with distant metastases
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Background: Methylmalonic acid (MMA), a metabolite and by-product of propionate metabolism, promotes breast cancer (BC) progression in mice via the transforming growth factor beta (TGFβI) signaling pathway (Gomes et al, Nature 2020). It is currently unknown if this effect also exists in patients with BC. This study is to investigate the association between baseline MMA concentrations in patients at BC diagnosis and the development of distant metastases via a matched case-control study.

Material and methods: We included 32 patients with early Luminal B-like BC (Lumb, median age 62.4y) and 52 patients with early triple-negative BC (TNBC, median age 50.5y) who developed distant metastases within 5 years. They were matched to an equal number of early BC patients with at least 5 years of follow-up (median age 62.2y for Lumb and 50.5y for TNBC) who did not develop distant metastases. Matching was performed based on age at diagnosis date (± 5y), tumor stage, and treatment received ((neo)adjuvant chemotherapy and radiotherapy, yes/no). Serum MMA concentrations were determined by liquid chromatography with tandem mass spectrometry (LC-MS-MS). Summary statistics, paired analyses, and multiple conditional logistic regression analyses were performed with and without adjusting for potential covariates (age, kidney function, and tumor
The selection of breast cancer patients for anti-HER2 treatment is based on HER2 positivity defined by IHC (immunohistochemistry) and/or in situ hybridization (ISH). However, there have been some discrepancies and ambiguity on HER2 classification, leading to several cut-off changes over the years and resulting in some of the patients with lower HER2 expression tumours not offered anti-HER2 treatments. Several studies also suggested that a subset of HER2 low breast tumours may respond to anti-HER2 treatments. The aim of this study is to understand the mechanisms of action that a subset of HER2 low expressing breast cancer cells (BC cells). The HER2 expression of a panel of 8 breast cell lines obtained from breast cancer patients to assess the effects of anti-HER2 treatments. The aim of this study is to understand the mechanisms of action that a subset of HER2 low expressing breast cancer cells (BC cells). The HER2 expression of a panel of 8 breast cell lines obtained from breast cancer patients to assess the effects of anti-HER2 treatments.

Methods: Using cell viability studies, we found that compared to high (IHC3+), moderately low HER2 expressing (IHC2+) and IHC1+ cells show an intermediate response to trastuzumab. We also showed that trastuzumab induces upregulation of HER ligands in these cells, resulting in activation of HER receptors. However, trastuzumab in combination with dual ADAM10/17 inhibitor to inhibit the shedding of HER ligands only showed a modest decrease in the cell viability in HER2-low BCs and PDOs. However, a panHER inhibitor neratinib or in combination with trastuzumab was effective in HER2-low BCs and PDOs although greater effect was seen in combination of trastuzumab and neratinib.

Conclusions: Baseline serum MMA concentrations and a gene signature for TGFiβ signaling at BC diagnosis are not associated with distant metastases among patients with Lumb and TNBC subtypes.

No conflict of interest.
plasma collected after two weeks of anti-HER2 neoadjuvant treatment. The obtained results highlighted potentially non invasive cardio-toxicity markers that could be used to monitor progression of cardiac damage and planning of therapeutic strategies.

**Conflict of interest:** Advisory Board: Serena Di Cosimo; Pierre-Fabre (outside the scope of this work).

**Abstracts, EBCC-13 Poster Session**

237 (PB-061) Poster Gene expression profile at week 2 of neoadjuvant therapy course predicts outcome in HER2-positive breast cancer patients: an explorative analysis from NeoALTTO

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**Background:** NeoALTTO showed increased pathological complete response (pCR) with paclitaxel combined with dual over single anti-HER2 blockade. The trial included six initial weeks of treatment with lapatinib (L), trastuzumab (T) or their combination (L+T) followed by chemotherapy (CHT). A tumor biopsy was planned during the CHT-free window at day 14 ± 2. Herein, we tested the hypothesis that prognostication of clinical outcome is feasible through assessment of gene expression profile (GEP) following two weeks of anti-HER2 therapy.

**Patients and methods:** RNA from matched baseline and day 14 ± 2 biopsies were profiled using Clarions Microarray (ThermoFisher). The levels of the molecular classifier TRAR, which proved to identify HER2-addicted (HER2-high low), TRAR-low and HER2-addicted (TRAR high, Estrogen Receptor [ER]-dependent) primary tumors, and five immune-related metagenes, namely, the T-cell surrogate lymphocyte-specific kinase (LCK), the monocytic/myeloid lineage hemopoietic cell kinase (HCK), interferon (IFN), major histocompatibility complex II (MHCI), and signal transducer and activator of transcription 1 (STAT1) were computed. Logistic and Cox regression models were applied to evaluate the association between TRAR and immune-related metagenes with pCR and event free survival (EFS), at baseline and after two weeks of treatment with anti-HER2 therapy.

**Results:** Overall, 180 matched baseline and day 14 ± 2 GEP samples were analyzed from patients treated with L (n = 65), T (n = 66), and L+T (n = 49). No significant differences in patient characteristics or outcomes were observed between the cohort included in our study and the whole NeoALTTO patient population. At baseline, none of the immune-related metagenes tested were informative of patient outcomes. After 2 weeks of treatment with anti-HER2, the expression levels of LCK (OR: 3.92, 95% CI: 1.96; 7.85), HCK (OR: 3.22, 95% CI: 1.55; 6.68), and MHCI (OR: 2.68, 95% CI: 1.37; 5.26) were significantly positively associated with pCR, independently from ER status and treatment arm. When considering changes from baseline, increased levels of LCK were also predictive (2.90, 95% CI: 1.48; 5.71), and those of HCK were associated with EFS regardless of pCR and nodal status (HR: 0.57, 95% CI: 0.34; 0.96). TRAR assessment at day 14 ± 2 was not predictive of outcome. However, both pre-treatment TRAR (Odds Ratio [OR]: 0.19, 95% CI: 0.08; 0.47), and its increase during treatment (OR: 3.99, 95% CI: 1.90; 8.39) were independently associated with pCR.

**Conclusions:** Biomarkers of early T-cell and monocytic/macrophage activation, as well as HER2 downregulation hold the potential to reliably identify patients likely to achieve a pCR and a favorable prognosis. New effective treatments need to be explored for cases lacking an early GEP response.

238 (PB-062) Poster Investigating the Role of Several Inner Nuclear Membrane Proteins In Triple Negative Breast Cancer

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**Background:** Triple Negative Breast Cancer (TNBC) is an aggressive, highly metastatic subtype of breast cancer, which has significantly poorer survival times in comparison to other breast cancers. To date, chemotherapy remains the standard of care for TNBC patients for which the nucleus has been implicated in several cellular processes known to be disregulated in tumourigenesis. However, a nuclear envelope targeting cancer therapy is yet to emerge. Our study investigates how several key inner nuclear membrane (INM) proteins contribute to TNBC tumourigenesis, and if downregulating these proteins inhibit TNBC inhibits tumour cell growth.

**Materials & Methods:** Bioinformatic analysis and cellular assays were utilised to assess the role of the INM proteins in tumour growth. The GENT2 database was used to analyse mRNA expression of several INM proteins in tumour and non-malignant patient samples. A panel of TNBC cell lines and non-cancerous MCF10A breast cell lines were used to establish the role of the INM proteins in tumour progression. Immunofluorescence and immunoblotting were utilised to determine the expression and localisation of each INM protein in TNBC and MCF10A cells. To investigate the role of the INM proteins in tumourigenesis, proteins were depleted by siRNA and cellular viability was measured by several assays, including an Annexin V/PI apoptosis assay, cell cycle analysis, and Incucyte proliferation assays.

**Results:** The transcript levels of INM proteins were shown to be significantly overexpressed in breast cancer patient samples compared to non-malignant tissue. Similarly, the INM proteins were overexpressed in the TNBC cell lines at the protein level, and siRNA-mediated depletion of these proteins specifically inhibited TNBC cell growth and induced aberrant nuclear morphology.

**Conclusions:** The INM proteins have an evident role in tumourigenesis and targeting these proteins may improve treatments for TNBC by providing a novel mechanism to specifically inhibit tumour cell growth. Elucidating the role of the INM in tumourigenesis may further enhance our capacity to develop cancer therapeutics.

239 (PB-063) Poster An expanded 29-gene HER2 signature robustly identifies genomic HER2-Type early-stage breast tumors

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**Background:** BluePrint® (BP) is a highly robust and reliable breast cancer (BC) 90-gene molecular subtype classifier which identifies the underlying biology of a tumor by classifying early-stage BC into three molecular subtypes, Basal-Type, Luminal-Type, and HER2-Type. BP measures the expression of 58 Luminal- 28 Basal- and 4 HER2-Type signature genes from Formalin Fixed Paraffin Embedded (FFPE) tumor tissues.

In recent years, the definition of HER2 'positive' (HER2+) has evolved as the heterogeneity of HER2+ BC has become more elucidated. The purpose of this study is to potentially expand the BP HER2 signature by evaluating additional genes that may capture the modern definition of HER2+.

**Materials and Methods:** For this study, we selected full genome microarray data of 1252 early-stage BC patient samples including all three BP molecular subtypes. Samples were split into training (n = 626) and test (n = 626) data sets. An additional set of 448 control samples with known BP results processed over 9 months were used to evaluate the BP HER2 expanded signature. Differential expression analysis was performed on the training set.
between the HER2- versus the Basal- and Luminal-Type tumors. Statistically significant differentially expressed genes were identified and further selected based on coefficient of variation (CV) for the most stable genes. Functional annotation and pathway analysis was performed using Gene Ontology and Reactome Pathway Analysis followed by comparison of the new signature with previously reported molecular subtyping signatures using Principal Component Analysis (PCA).

Results: Our approach resulted in an expanded 29-gene HER2-Type signature. The 29 genes had an exceptionally low CV of ~5% indicating that they have a high stability. Among the 29 genes, 7 are from the HER2 amplicon and known to be upregulated in pathologically confirmed HER2+ tumors. Pathways associated with these genes include PI3 K and AKT signaling, which have a key role in cancer development.

Similarly to the 80-gene assay, the expanded BP HER2 signature could also better identify the molecularly HER2-Type versus non-HER2-Type tumors, based on the higher percentage of variance captured by PCA, than previously reported molecular subtyping signatures, while having an excellent concordance (97%) with the original 80-gene BP.

Conclusions: The expanded 29-gene BluePrint HER2-Type signature represents even more biological diversity within the HER2-Type tumors, therefore potentially improving treatment outcome. The 29 genes include known HER2 amplicon genes and other genes involved in several oncogenic signaling pathways. Importantly, it is yet to be determined whether improved recognition of the HER2-Type increases treatment response prediction with HER2-targeted therapies, which is part of future research.

Conflict of interest: Other Substantive Relationships: All authors are non-commercial employees of Agendia, the company that markets the 80-gene molecular subtyping assay, known as BluePrint.

240 (PB-064) Poster
A novel biomarker to predict DNA-Repair-inhibitor response in stage I-III high risk breast cancer patients
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Background: The combinations of PARP inhibitor (PARPi) and platinum-based drugs are gaining more interest as first line therapy for early-stage breast cancer. The I-SPY2 trial (NCT0142379) evaluated different DNA-Damage-Repair (DDR) deficiency biomarkers that predict response to DNA damage agents. Here we aimed to translate the I-SPY2 research findings to a robust clinical grade platform signature to predict sensitivity to PARPi and platinum-based chemotherapy.

Material and methods: For this study, 72 fresh frozen pre-treatment biopsies from patients enrolled in the ISPY2 Veliparib+Carboplatin (VC) arm, were analyzed with whole transcriptome microarray following standard diagnostics at Agenda. All 72 patients had a High Risk MammaPrint® 70-gene profile. Pathological complete response (pCR) was defined as no residual invasive cancer in breast or nodes at the time of surgery. From the total set, 27 patients had pCR (5 HR(hormonal receptor)+HER2- 22 Triple Negative (TN)) and 45 had residual disease (RD) (28 HR+HER2- 17 TN). Biomarker development was based on the identification of significantly differentially expressed genes between pCR and RD groups, while balancing the HR status as well as prior knowledge on the biological relevance of the genes (i.e. genes relevant to DDR were prioritized). A leave-one-out cross-validation was employed due to a limited sample size. The significance criteria were based on the absolute value of the effect size (|ES|>0.5).

Results: A set of 60 genes was selected after passing the significance criteria. Large majority of the signature genes (>70%) are related to DDR pathways among which homologous recombination repair, non-homologous end joining repair, Fanconi anemia and other conserved DDR genes. The performance of the biomarker on the development set was 94% accuracy, 96% sensitivity and 93% specificity across all patients. Sensitivity and specificity in the TN group were 95% and 94%, and in HR+HER2- 100% and 93%, respectively. Independent performance assessment using the Brightness data set yielded an average of 67% accuracy (with standard deviation = 11%), 67% sensitivity (n = 10) and 65% specificity (n = 11%). Relatively large standard deviation pointed to heterogeneity within this cohort.

Conclusion: In the ISPY2 VC arm, RePrint predicts pCR with high accuracy, sensitivity and specificity. The performance on the Brightness dataset indicates the potential RD predictive value of RePrint on RNAseq data. The signature includes genes from various DDR pathways indicating that it may detect patients with DDR deficiency that could be candidate for DNA damage response therapy.


241 (PB-065) Poster
Single nucleotide polymorphisms of ABCB1 (rs1128503) and ABCC2 (rs145008610) genes and its clinical impact in ER & PR positive breast cancer patients in a tertiary care hospital of India
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Background: Inter-individual differences in drug response are frequent clinical challenge due to genetic variation. ATP-binding cassette (ABC) transporters are crucial determinants of drug disposition and have been studied extensively in response to chemotherapeutic regimen and tamoxifen treatment. But no major findings were established till date in Indian scenario that correlates the effect of drug in ABC polymorphism.

In our study we aim to investigate the impact of ABCB1 (rs1128503) and ABCC2 (rs145008610) gene polymorphisms with reference to the clinical characteristics and adverse drug reactions in hormone receptor positive Breast Cancer (BC) patients who received tamoxifen adjuvant therapy.

Materials and Methods: In this monocentric, observational study, 121 patients were recruited with histologically proven hormone receptor positive BC from surgical OPD of Chittaranjan National Cancer Institute, Kolkata. Tamoxifen therapy (20 mg orally daily till 3 years) was given to the recruited patients after first-line treatment with surgery followed by adjuvant/ neo adjuvant chemotherapy with different regimens administered according to NCCN guidelines. The dose was determined as per patient’s BSA value. 5 ml peripheral blood was withdrawn during the treatment to isolate genomic DNA and polymorphism analysis of ABCB1 (167964T>C) and ABCC2 (58626T>C) gene was performed using PCR-RFLP method. PET-CT/ CECT/MRI reports were clinically correlated with genotypic data to assess the drug response and adverse drug effect among the attendees.

Results: Majority of the BC patients (n = 121) are diagnosed in stage II (52.9%), 41-60 (57.9%) age group are more prone to develop breast cancer. Infiltrating Ductal Carcinoma (83.5%) found to be the most common pathological subtype, maximally with grade II tumor (58%); tumor size range between >2cm-≤5 cm were most prevalent. In this study, significantly different in response categories among treatment group and significantly unequal survival outcome were seen between responder, non-responder and partial responder (long rank p = 0.225). Median overall survival was achieved within 48 months. Overall response rate was 94.2%. ABCB1 and ABCC2 gene polymorphism is non-significant with clinical parameters. Furthermore, no statistical significance (p > 0.05) was found with adverse events of Chemotherapeutic regimens and tamoxifen adjuvant therapy in comparison to ABCB1 and ABCC2 on the development set 94.2%.

Conclusion: Our study interprets that, ABCB1 (rs1128503) & ABCC2 (rs145008610) gene polymorphism may not be a predictor of treatment outcome of patients with respect to hormone positive breast cancer patients. Moreover, transporter genes may not significantly associate with adverse drug reaction thus no effect in overall survival. However, small sample size of our study restricts the statistical power.

No conflict of interest.
Development of a multiplex dPCR assay for ERBB2 amplification in breast cancer

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Background: ERBB2 amplification on chromosome 17 serves as a marker for prognostic and therapeutic response in HER2+ breast cancers, most notably in breast cancer. Although immunohistochemistry (IHC) and in situ hybridization (FISH/SISH/CISH) remain the gold standard for clinical diagnosis of ERBB2 amplification, their semiquantitative and subjective nature are limitations that warrant the exploration of alternative quantitative, reliable, rapid, and cost-effective complementary approaches such as digital PCR (dPCR). Here we describe initial results with a dPCR-based SAGAplex™ assay for ERBB2 amplification.

Material and Methods: We developed a single-reaction SAGAplex multiplex dPCR assay that enables simultaneous quantification of two common allelics of ERBB2, a control region CEP17 (a locus within the chromosome 17 centromere) and a copy number stable control region located near cytoband 2p13.1 (CNS-2p13.1). For 351 primary breast cancer patients selected from the SCAN-B cohort (ClinicalTrials.gov NCT02306096), ERBB2 copy number was determined using the SAGAplex assay on DNA isolated from surgical tumor samples obtained at surgery. ERBB2, CEP17, and CNS-2p13.1 copy numbers were utilized combinatorially to evaluate gain of ERBB2 and correspondence to the clinical HER2 status (FISH/SISH). Thresholds were determined by ROC analysis.

Results: Within the cohort of 351 cases, 121 breast tumors were clinically HER2-positive. SAGAplex ERBB2 multiplex analysis was successfully performed in all cases. dPCR-ERBB2 status was evaluated using several combinatorial metrics utilizing the measured copy numbers for ERBB2, CEP17, and CNS-2p13.1. When benchmarked to the clinical HER2 status, the sensitivity of the SAGAplex assay ranged from 86.8% to 92.6%, and the specificity ranged from 89.6% to 98.3%. Discordances may be due to tumor heterogeneity, tumor cellularity, false positive or negative assay performance, or an incorrect clinical result. For example, one patient had cancer evaluated IHC 3+ but not amplified by FISH and she received endocrine treatment but did not receive anti-HER2 therapy and survived 6.7 months.

Conclusion: The results thus far illustrate good concordance between clinical HER2 status and ERBB2 status as determined by a SAGAplex multiplex dPCR assay. Further development, evaluation, and validation is ongoing. Rapid, quantitative, robust, and cost-effective multiplex dPCR could be an alternative or supplementary approach for determining ERBB2 amplification in cancer.

Conflict of interest: Ownership: YC, MA, LHS have ownership and employment interest in SAGA Diagnostics AB.

A higher number of HSP70 positive immune cells in a deep layer of TNBC is associated with a higher FoxP3 expression and a higher risk of axillary lymph node involvement

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Background: The high mutation burden of triple-negative breast cancer (TNBC) is related to its immunogenic potential. The presence of tumour infiltrating lymphocytes (TILs) in the preclinical stage of disease reflects a proinflammatory immune response against cancer cells. However, cancer cells may modulate it to support tumour growth and progression. A chaperone HSP70 molecule expression, upregulated by oncogenic signaling, supports the formation of early-stage breast cancer (BC) as well. Moreover, in the later course of the disease, HSP70 is actively released by the cancer cells and can induce the termination of the specific immune response. The aim of this study was to explore the potential predictive value of the HSP70 expression in a deep layer (HSP70-IC-DL) of TNBC.

Material and methods: Clinical data and surgical tissue specimens from 68 consecutive, stage-I-III, TNBC patients, submitted to the upfront surgery in Clinical Hospital Centre Rijeka in the period from 2008 till 2016, as well as the 36 control specimens from benign breast tissue biopsies, were included in the present retrospective study. TILs, CD8, CD4, FOXP3, CD68, CD11c, PDL-1, CTLA-4 and HSP70 staining were evaluated in both groups by two independent dedicated breast cytopathologists.

Results: In contrast to benign breast tissue, a significantly higher infiltration of all immune cells, including HSP70-IC-DL, was observed in the study group (p < 0.001). The following positive correlations were detected with the respect to the number of HSP70-IC-DL: TILs expression in both layers (superficial, rho = 0.30, p = 0.025, deep, rho = 0.38, p = 0.002), FOXP3 expression in the superficial layer (rho = 0.42, p = 0.001; rho = 0.61, p = 0.026) and CTLA-4 expression in a deep layer (rho = 0.34, p = 0.006). Consistent with our previous findings, HSP70-IC-DL is associated with the adverse clinical and pathological markers as well: higher stage of disease (p = 0.015), higher grade (p = 0.013) and a higher pN status (p < 0.001). The latest association may represent a valuable tool for the prediction of the lymph node involvement (AUC = 0.78, p < 0.001) as well as the lymph node capsule penetration (AUC = 0.79, p < 0.001).

Conclusion: Upon the results of our previous analysis and the available literature data, we hypothesized the correlation of HSP70-IC-DL with the cancer-induced immunotolerance in the BC. Herein presented correlations of HSP-IC-DL with the FOXP3 and CTLA-4 expression in TNBC further support our initial findings. Targeting the HSP70 molecule, or the HSP70-related pathways in TNBC could have a role in further immunotherapy development in this BC subtype. In addition, routine evaluation of HSP-IC-DL may improve clinical decision-making with respect to axillary surgery in TNBC patients. Further translational and clinical research is required to confirm our observations.
BREATHE-Q as ePROs was a good layout with comprehensible and effective information.

Three major aspects of potential improvement to take into consideration before placing the BREATHE-Q to use were identified: Difficulty consenting with a signature, confusion regarding automatic calculation of BMI and voluntariness in relation to answering questions concerning sexual well-being.

**Conclusion:** The findings from the usability and feasibility tests facilitated improvement of the layout in the ePROs. It led to removal of the signature function, being assured that consent via a checkbox was adequate and legal. In addition, a field, which calculated BMI was hidden from participants and questions regarding sexual well-being was made voluntary. The latter, because it became evident, that in particular, one question could not be answered by patients who are not sexually active.

In conclusion, the usability and feasibility test of BREATHE-Q as ePROs led to essential alterations in the layout of the ePROs making them more user-friendly and fit for the target audience.

**No conflict of interest.**

**245 (PB-069) Poster**

Exploring the lymph node’s microenvironment for personalized management of luminal A breast cancer

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**Background:** Lymph nodes (LN) are the main doorway for tumor cell metastasis from the primary site and its evaluation is a major prognostic factor. The One Step Nucleic Acid Amplification (OSNA) is being adopted worldwide for sentinel-LNs (SLNs) staging in breast cancer (BC). SLNs excision is one of the main procedures during breast surgery. OSNA Lysates were prepared for target RNA sequencing analysis, using the DESeq2 R package (version 1.36.0) in R (version 4.2.0). Data analysis was performed using SPSS® version 27.

**Results:** In pT1 tumours, SLN status was positive in 20.8% of the non-palpable tumours and in 32.2% of the palpable tumours (p = 0.20). The mean TTL of the positive SLN in the non-palpable tumours was 40.75 CK19 mRNA copies/μL [280 – 730 000] and it was 105 795 CK19 mRNA copies/μL [300 – 730 000] in the palpable tumours (p = 0.58).

In pT1 tumours, SLN status was positive in 22.5% of the non-palpable tumours and in 26.8% of the palpable tumours (p = 0.81). Mean TTL in pT1 tumours was 44 906 CK19 mRNA copies/μL [280 – 420 000]; 22 701 CK19 mRNA copies/μL [280 – 280 000] in pT1 non-palpable tumours versus 77 204 CK19 mRNA copies/μL [300 – 420 000] in palpable tumours (p = 0.18).

**Conclusions:** Even though palpable tumours have a higher mean TTL, we were unable to evidence TTL differences or even axillary LNs involvement differences between palpable and non-palpable tumours, mainly due to the study small sample size.

**No conflict of interest.**

**246 (PB-070) Poster**

One-step nucleic acid amplification assay in palpable and non-palpable breast tumours

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**Background:** The one-step nucleic acid amplification (OSNA) assay quantifies the cytokeratin 19 (CK19) messenger RNA copy number, which is currently being used for assessment of axillary sentinel lymph node (SLN) status in breast cancer. The total tumour load (TTL), defined as the total amount of CK19 mRNA copies in all positive SLNs, may help predicting additional metastatic axillary involvement besides SLN. There is evidence suggesting that palpable and non-palpable breast tumours manifest distinct pathological features, making tumour palpability a putative predictive factor of axillary lymph node involvement. This is the first study aiming to evaluate the potential relationship between breast tumour palpability and SLN biopsy with OSNA assay.

**Material and methods:** Patients with breast cancer diagnosis and SLN study with OSNA assay were included in this cross-sectional study. Statistical analysis was performed using SPSS® version 27.

**Results:** A total of 155 patients with breast tumours were included: 63.2% with non-palpable tumours (mean histologic size = 14.7 ± 9.7 mm; mean TTL of the positive SLN 36.8% with palpable tumours (mean histologic size = 19.5 ± 13.2 mm); (p = 0.01). According to the pTNM staging, 33.3% of the non-palpable tumours had a T stage ≤ pT1 vs 73.2% of the palpable tumours (p = 0.02). The mean age in the non-palpable group patients was 59 years old (37–77) and it was 61 years old (42–79) in the palpable group (p = 0.15). In both groups, more than 80% of the patients were postmenopausal (p = 0.92), the majority had invasive carcinoma (p = 0.29) and intrinsic molecular subtype classified as Luminal A (p = 0.55).

SLN status was positive in 20.8% of the non-palpable tumours and in 32.2% of the palpable tumours (p = 0.20). The mean TTL of the positive SLN in the non-palpable tumours was 60 725 CK19 mRNA copies/μL [280 – 430 000] and it was 105 795 CK19 mRNA copies/μL [300 – 730 000] in the palpable tumours (p = 0.58).

In pT1 tumours, SLN status was positive in 22.5% of the non-palpable tumours and in 26.8% of the palpable tumours (p = 0.81). Mean TTL in pT1 tumours was 44 906 CK19 mRNA copies/μL [280 – 420 000]; 22 701 CK19 mRNA copies/μL [280 – 280 000] in pT1 non-palpable tumours versus 77 204 CK19 mRNA copies/μL [300 – 420 000] in palpable tumours (p = 0.18).

**Conclusions:** Though the significant p-values found were not enough to call this an “efficacy” evidence for this assay, the findings from this study are promising, as the correlation between tumour palpability and additional axillary lymph node involvement should be further investigated, in order to recommend OSNA use in surgery for breast cancer patients.

**No conflict of interest.**
Background: CUB-domain containing protein 1 (CDCP1) is a transmembrane receptor involved in the progression of several cancers. Recent studies demonstrate that CDCP1 is a rational target for the development of innovative targeted therapies for cancer including theranostics agents and antibody-drug conjugates.

Material and methods: To determine the therapeutic potential of CDCP1 in breast cancer, we investigated its expression in multiple cohorts of breast cancer tissues by immunohistochemistry, as well as in various preclinical models including cell lines, primary cells and patient-derived xenografts using flow cytometry, western blot and immunofluorescence staining. Then, we evaluated the capacity of the CDCP1-targeting chimeric antibody ch10D7 to specifically accumulate in breast cancer lesions in in vivo preclinical models including patient-derived xenografts and breast cancer metastasis models. Finally, we determined the efficacy of the ch10D7-MMAE antibody-drug conjugate to kill breast cancer cells in vitro and breast tumours ex vivo and in vivo.

Results: The CDCP1 receptor is expressed at detectable level in a significant proportion of breast cancer cases with high/intermediate expression detected in ~30% of localized ER-positive cases, ~50% of metastatic ER-positive cases and >70% of Triple negative or HER2-positive cases. Similar proportion of expression was detected in cellular models. We demonstrated that ch10D7 antibody labelled with the radionucleotide Zirconium-89 specifically accumulates in breast cancer lesions in vivo allowing the detection of mammary-fat pad implanted patient-derived xenografts and of breast cancer metastasis by PET/CT imaging. Finally, we confirmed that the ch10D7-MMAE antibody-drug conjugate is very efficient at inducing cell death in vitro as well as controlling primary tumour and metastatic tumour burden in pre-clinical models, conferring a significant survival advantage compared to classical therapy.

Conclusion: Our work demonstrates that CDCP1 is a potential target to detect and limit the progression of breast tumours and that biomolecules specifically recognising this receptor are promising agents which could improve survival of patients.

Conflict of interest: Ownership: Prof Hooper, Dr He and Dr Kryza are inventor on a patent covering the utilization of CDCP1-binding molecules for diagnosis and treatment of cancers.

Corporate-sponsored Research: N/A

Other Substantive Relationships: N/A

248 (PB-073) Poster Prognostic impact of HER low expression in early breast cancer in a Tunisian center

H. Rachidi, S. Driss, A. Lahrouz, Y. Berrazega, N. Daoud, N. Mejni, H. Boussejn

Background: Identification of HER2 status in early breast cancer (EBC) is experiencing a paradigm change, leading to the identification of a new entity (HER2-low), defined as immunohistochemically 1+ or 2+ and lack of HER2 gene amplification. This entity is depending on the HR status. Until now, HER2-low status has not been validated as an independent prognostic factor but it could be a promising new target for antibody–drug conjugates (ADCs) which are under investigation.

Material and methods: We retrospectively reviewed clinical and anatomicopathological data from patients treated for EBC from 2014 to 2017 and who had either negative or low HER2 status.

We assessed the impact of HER2-low on survival outcomes (OS and PFS) using Cox models.

Univariable analysis adjusted for T and N of TNM classification, SBR score, molecular type (luminal or triple negative) and Ki 67 status, were realized.

Results: Our study included 201 patients of which 112 (55.7%) had HER2-low BC. Median age was 50 years (29–80). Seventy five percent were HR+ and 25% HR-.

With a median follow-up of 55.4 months, 5-years OS was better in the HER2-2 group (77.19% in the HER2-low group, and 84.44% in the HER2-0 group, with a significant difference between the two groups [95% CI: 76.96, 85.11] (p = 0.047).

DFS was lower in the HER2-low group with 60.7% HER2-0 groups but insignificant (p = 0.123).

In univariate analysis, we observe a significant prognostic impact of molecular subtype, triple negative and Ki 67 status (> 20%) HR [95% CI: 77.63; 85.85] (p = 0.003) and HR [95% CI:76.60; 85.05 ] (p =0.000) respectively. However multivariate analysis did not show any significant factor impacting overall survival.

Conclusions: We showed that 5-years DFS and OS, seems to be lower in the HER2-low group with statistical significance for the OS. Findings suggest that HER2-low breast cancer is significantly different from HER2-0 breast cancer with regard to HR status. Larger studies are warranted to clarify whether HER2-low is an independent prognostic marker in EBC or whether it represents a biomarker that may impact treatment decisions.

No conflict of interest.
Background: Breast cancer is the most common form of cancer diagnosed in women worldwide, and is one of the leading causes of death among women in Greece. Elevated levels of cfDNA in the blood of breast cancer patients have been demonstrated in a few studies in the past. As the scope of breast cancer intratumour genetic heterogeneity unravels, the development of robust and standardized methods for the assessment of circulating biomarkers like cfDNA will be essential for the realization of the potentials of personalized medicine. The aim of this study is to correlate the patient’s cfDNA levels with the different molecular subtypes of the disease.

Materials and Methods: The present study was conducted at the Hippocratie General Hospital of Athens in collaboration with the Hellenic Anticancer Institute. It has been approved by the scientific board of the hospital and every included woman has signed a consent form. Blood samples were collected from women who were diagnosed with different molecular subtypes and also from healthy women. After the blood sample collection, the samples were sent to the Hellenic Anticancer Institute where cfDNA was quantified directly in unpurified plasma using a Qubit fluorometer 4.0 (Invitrogen Ltd., Life Technologies, UK) and a Qubit dsDNA HS Assay kit (Invitrogen Ltd., Thermo Fisher Scientific, UK) according to manufacturer’s instructions. All statistical analyses of the results were performed using SPSS 22.0. Student’s t-test was used to examine differences in circulating levels of cell-free DNA among the comparison groups.

Results: In total 148 women were included in this study (117 patients and 41 healthy). Patients with breast cancer had significantly higher levels of circulating cell-free DNA compared to healthy subjects (mean values: 617.5 ng/ml, p = 0.012 for Luminal B, 660 ng/ml, p = 0.007 for Luminal A, 711.4, p = 0.002 for Triple Negative; 691, p = 0.005 for Her-2 positive).

Conclusion: Measurement of cfDNA concentration in patients with breast cancer is a promising biomarker, as the levels of cfDNA are significantly higher in all subtypes of breast cancer compared to healthy subjects (mean values: 617.5 ± SD ng/ml, p < 0.001). The levels of cell free DNA were significantly higher in all subtypes of breast cancer compared to healthy subjects (mean values: 617.5 ± SD ng/ml, p < 0.001) for Luminal B, 660 ± SD ng/ml, p = 0.007 for Luminal A, 711.4 ± SD ng/ml, p = 0.002 for Triple Negative; 691 ± SD ng/ml, p = 0.005 for Her-2 positive).

No conflict of interest.

251 (PB-075) Poster Plasma L-arginine metabolic profiling in breast cancer patients reflects differences in cellular gene expression and metabolic activities according to subtype – A translational study in human breast cancer

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Background: L-arginine is a semi-essential amino acid; its availability for protein synthesis is limiting for cell proliferation. It is also a substrate for nitric oxide synthases (nNOS, iNOS, eNOS) and arginases (ARG) 1 and 2. The effects of L-arginine on cell proliferation and disease progression in breast cancer have remained controversial. We studied whether breast cancer subtypes show different levels of L-arginine and its metabolites, and if this relates to NOS and ARG isoform expression and tumor cell proliferation.

Materials and Methods: In 220 women with early breast cancer without overt metastatic disease, we analyzed plasma levels of L-arginine, L-citrulline (product of NOS), and L-ornithine (product of ARG) by UPLC-MS/MS in blood samples drawn before therapy. L-citrulline/L-arginine (cit/arg) and L-ornithine/L-arginine (orn/arg) ratios are surrogates of NOS and ARG activity, respectively. We correlated metabolite levels with ER, PR, and HER2 scores, Ki-67 index, and lymph node (LN) status. Further, we studied mRNA expression of NOS and ARG isoforms by qRT-PCR, L-arginine metabolite levels by UPLC-MS/MS, and cell proliferation by image cytometry in MCF-7, SK-BR-3, MDA-MB-231, MDA-MB-468, and BT-474 breast cancer cells.

Results: The highest cit/arg ratio was found in plasma samples of patients with ER+HER2+ tumors (0.65 ± 0.29), whereas patients with triple negative breast cancer had the lowest cit/arg ratio (0.52 ± 0.22). The latter group also had the highest proliferation scores. Cit/arg ratio was lower in patients with >1 positive LN than in those with 0 or 1 (p < 0.04). Orn/arg ratio did not differ between clinical breast cancer subtypes. In vitro experiments showed that RNA expression levels of all NOS isoforms (NOS I, NOS II, NOS III) were highest in ER+ breast cancer cells (BT-474 > MCF-7). In agreement with this, cellular cit/arg ratio was highest in BT-474 cells. These results are in line with those obtained in the breast cancer patients. Both triple-negative cell lines showed the lowest expression of NOS isoforms and the highest proliferation rates. ARG2 gene and protein expression was high in BT-474 and MDA-MB-468 cells, as was the orn/arg ratio. ARG1 was not expressed in any of the breast cancer cell lines.

Conclusion: In this translational study we found agreement between plasma metabolic ratios in vivo and molecular analysis in corresponding cell lines in vitro. Breast cancer cells are a representative and suitable model to further investigate molecular mechanisms according to subtype and possible interventions. Analysis of the expression of L-arginine metabolizing enzymes and plasma metabolic ratios may help to utilize metabolic fingerprinting in the different breast cancer subtypes to further individualize therapy approaches.

No conflict of interest.
### Table: Vitamin D levels and VDR expression in relation to breast cancer mortality

<table>
<thead>
<tr>
<th>Vitamin D level</th>
<th>VDR expression group</th>
<th>Numbers</th>
<th>Dead breast cancer</th>
<th>HR (CI 95%)</th>
<th>HR* (CI 95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Low</td>
<td>VDR pos</td>
<td>248</td>
<td>38</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>VDR neg</td>
<td>193</td>
<td>53</td>
<td>2.15</td>
<td>(1.32–4.39)</td>
</tr>
<tr>
<td>2nd Medium</td>
<td>VDR pos</td>
<td>229</td>
<td>37</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>VDR neg</td>
<td>68</td>
<td>14</td>
<td>2.04</td>
<td>(1.13–4.52)</td>
</tr>
<tr>
<td>3rd High</td>
<td>VDR pos</td>
<td>55</td>
<td>18</td>
<td>2.10</td>
<td>(0.96–4.59)</td>
</tr>
<tr>
<td></td>
<td>VDR neg</td>
<td>248</td>
<td>38</td>
<td>1.00</td>
<td>(0.88–4.41)</td>
</tr>
</tbody>
</table>

*Adjusted for age at and season of diagnosis, size of tumor, lymph node status, and molecular subtypes

**Conclusions:** There was no statistical evidence for an association between pre-diagnostic levels of vitamin D and the expression of VDRs in breast cancer, nor did vitamin D levels influence the association between VDR expression and breast cancer mortality. Further studies are needed in order to establish the effects of vitamin D on breast cancer.

**No conflict of interest.**

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### 253 (PB-077) Poster Surgical choices and complications in elderly women: a single center retrospective analysis in frail vs non frail breast cancer patients

**Authors:** P. Costa1, M. Debiasi2, B. da Silva Reus3, A. Cardoso2, D. Pinto2, P. Gouveia2, R. Andres-Luna2, C. Mavioso2, J. Anacleto2, F. Cardoso2, 1Unit, Lisbon, Portugal; 2University of Lisbon Medical School, Epidemiology Master of Science Program, Lisbon, Portugal

**Background:** Early Breast Cancer (EBC) in the elderly is a major public health problem and a risk factor for undertreatment due to concerns of complications. While underrepresented in clinical trials, invaluable clinical insights for this population rely on real-world data.

**Objective:** To describe surgical patterns and outcomes of an elderly population diagnosed with EBC treated in a European BC-dedicated center.

**Material and methods:** A retrospective cohort of all breast cancer patients ≥ 70 years old submitted to breast surgery for EBC from 2018 to 2021 was evaluated. Patients were included only if submitted to the G8 screening tool. Data was collected as a G8-C14. Data on standard demographics, G8 screening, comorbidities, oncological and reconstructive surgery performed and surgical outcomes were collected.

**Results:** Overall, 192 patients were included; 67 of these patients (35%) were considered frail. Median age was 76.8 years. Charlson Comorbidity Index (CCI) ranged from 3 to 7 and 93.8% of patients had at least one comorbidity. Frail patients were significantly older (p < 0.01), had worse CCI (p < 0.01) and ASA (p < 0.01) scores and more comorbidities (p = 0.09). In total, 199 breasts were operated, with 7 patients having bilateral tumors. One hundred and seventy three (86.0%) of these were breast conservative surgeries (BCS) and 26 (13.1%) were mastectomies; this proportion was similar in both frail and non-frail groups. In the frail population, oncoplastic surgery after breast reconstruction (BR) was more frequently therapeutic mammoplasty: 20 (33%) patients. No reconstruction was reported after mastectomy. In the fit group, more diversity was seen in oncoplastic procedures after breast conservation: 22 mammoplasties (19.5%), 3 lateral intercostal artery perforator flaps and 1 implant-based reconstruction; 13 (76.5%) breasts were reconstructed with immediate breast implant after mastectomy. Frail patients were less likely to be offered BR (p < 0.01). One or more complications occurred in 30.2% of patients, mainly seromas (41.7%) and hematomas (23.3%), but there were no significant differences in both groups. The rate of postoperative complications in reconstructed breasts was 66.7%. There was no statistically significant association between frailty and in hospital length of stay, readmission or reintervention, though numerically higher in frail patients.

**Conclusions:** Our results suggest that G8 frail patients are less likely to be offered BR. Even if there were no significant differences in surgical adverse outcomes between groups, this could have been masked by a higher proportion of BR among fit patients, a more complex surgery expected to yield to more complications. G8 screening can be a useful instrument to support the surgeon’s decision to whether or not to consider BR in elderly breast cancer patients.

**No conflict of interest.**

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### 225 (PB-079) Poster Analysis of fatty acid composition profile of tumoral and non-tumoral tissues from breast cancer patients

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**Background:** Breast cancer is the most diagnosed cancer, with 2.3 million estimated new cases (11.7% of total cases). In woman, breast cancer has high incidence (24.5%) and mortality (15.5%). Several factors influence the...
CAV1 is a master regulator of cell signaling and metastasis and may be a potential prognosticator, especially for patients with breast cancer. Our aim was to determine the FA profile differences in the tumoral and non-tumoral breast cancer tissues.

**Results:** We analyzed FA composition by GC-MS from 50 mg of tumoral and 50 mg of non-tumoral breast tissue resected from the same patient (n = 4 non-tumoral adjacent breast tissue and n = 4 tumoral breast tissues). No significant differences were detected in total FA between non-tumoral and tumoral tissues (394.9 ± 284 vs. 228.9 ± 136.6, p = 0.33), b) saturated (48.23 ± 50.7 vs. 22.06 ± 10.01, p = 0.35), c) monounsaturated (69.98 ± 81.2 vs. 104.8 ± 69.85, p = 0.088), d) PUFA (3.553 ± 1.978 vs. 7.115 ± 3.22, p = 0.1), e) n-6 PUFA (49.36 ± 56.16 vs. 5.048 ± 3.148, p = 0.16), f) n-3 PUFA (136.2 ± 106.9 vs. 47.73 ± 24.07, p = 0.15), and g) n-6/n-3 PUFA ratio (0.2379 ± 0.2767, p = 0.68). Interestingly, only n-6 PUFA, arachidonic acid (ARA) showed differences between non-tumoral and tumoral breast tissue (1.41 ± 0.73 vs. 1.74 ± 1.19, p = 0.02).

**Conclusions:** The results suggest no different FA composition, neither in n-6/n-3 PUFA ratio between tumoral and non-tumoral adjacent breast tissue in patients. Increased AA levels in tumoral breast tissue may be related to mechanism of carcinogenesis at molecular level.

There were 145 patients who were followed for up to 15 years and 215 had a recurrence of which 61 had a TTACA haplotype. Two-tail Student's t-tests were used to compare the mean differences between tumoral and non-tumoral adjacent breast tissue.

**Results:** Five common haplotypes were found (>10%). None was associated with tumor characteristics. Only the TTACA haplotype found in 4.04%) was associated with outcome. The TTACA haplotype conferred a borderline increased risk for any recurrence, adjusted hazard ratio (HR) = 1.39 (95% CI 0.96–2.01), which was mainly driven by an increased risk for locoregional recurrence HR = 2.24 (95% CI 1.24–4.04).

**Conclusions:** The TTACA haplotype of CAV1 predicted increased risk for locoregional recurrence. If the finding is confirmed, patients with TTACA haplotypes may derive benefit from more tailored treatment to prevent locoregional recurrences.

**Conflict of interest:** Ownership: AB is co-founder and board chair for SACRA therapeutics Advisory Board: AB has participated in Advisory Boards for Pfizer and Novartis Board of Directors: AB is co-founder and board chair for SACRA therapeutics Other Substantive Relationships: AB has received travel support from Roche and lecture fees from Eli-Lilly

**Background:** Breast cancer (BC) is the most frequently diagnosed cancer worldwide and the second leading cause of cancer-related deaths. To advance predictive recurrence models we developed an AI-image analysis platform that utilizes whole slide images (WSI) to phenotype invasive BC (IBC) at the tissue-cell architectural level. The objective was to produce an AI-IBC phenotype that includes a novel methodology to grade BC along with additional features that reflect biological pathways. We sought to combine these extracted and complex image feature sets with standard clinical pathology data to develop readily accessible models that predict early-stage BC recurrence.

**Methods:** 2075 patients from 2004–2016 (Mount Sinai Health System, NYC, NY USA) with early-stage invasive ductal lobular BC, followed for a median of 6 years, were divided 3:1 into training and validation cohorts. H&E WSI, 40X magnification (Philips, Netherlands) were interrogated with a deep learning morphology feature array (MFA) to extract tumor cell and tissue architectural morphologic features prioritized based on associations with breast cancer recurrence (BCR) events with a c-index range of <0.4 (–) or >0.4 (+). Available clinical data for modeling included: age, race, tumor size, grade, anatomic stage, lymph node status, and ER/PR/Her2. Recurrence events were classified as locoregional, distant metastasis and overall survival. C-index/AUC curves, Kaplan-Meier, hazard ratio (HR), sensitivity, specificity, NPV, and PPV were used to assess risk discrimination.

**Results:** In the training model (n = 1559) clinical features included: age, tumor size, anatomic stage, lymph node status (grade was not selected) and 7 imaging features which reflected an AI-grade IBC phenotype, yielded a C-index of 0.78 (95% CI, 0.76–0.81) vs. clinical 0.71 (95% CI, 0.67–0.74) and image feature models 0.72 (95% CI, 0.70–0.74). A risk score of 58 (scale 0–100) stratified patients as low- or high-risk, HR 5.5 (95% CI, 4.19–7.2, p < 0.001), with a sensitivity 0.71, specificity 0.77, NPV 0.95, and PPV 0.32 for predicting BCR within 6 years. In validation (n = 516), the model produced a C-index of 0.75 (95% CI, 0.72–0.79) vs. clinical 0.71 (95% CI, 0.66–0.75) vs. image feature models 0.67 (95% CI, 0.63–0.71). When patients were stratified by a risk score of 58, the HR was 4.4 (95% CI, 2.7–7.1, p < 0.001), sensitivity 0.60, specificity 0.77, NPV 0.94, and PPV of 0.24 for predicting BCR.

**Conclusion:** We developed and validated a novel AI-enabled digital platform which successfully predicted early-stage BCR within 6 years using only the H&E stained image and readily available clinical pathology variables. Additional cohort studies are underway to further expand upon these initial validation results.

**Conflict of interest:** Other Substantive Relationships: PreciseDx employees
258 (PB-083) Poster
Cytokine identification in seroma fluid after mastectomy in breast cancer patients: first results from SerMa pilot study subgroup
Background: Metastatic Triple Negative Breast Cancers TNBCs become non-responsive to current chemotherapeutic treatment options. For decades Cisplatin is used in the treatment of different cancers and has shown clinical benefit against TNBCs. However, acquired resistance towards Cisplatin impedes its long-term benefits against TNBCs. Others and our studies have observed higher expression of AKT2 in TNBC cells and clinical samples, and dismal role of AKT towards drug response in other cancers is established. The role of individual isoform of AKT1/2/3 is not extensively investigated towards Cisplatin treatment in TNBCs. We tried to investigate the expression of AKT1/2/3 in the primary and metastatic patient tissue and co-relate isoform specific role towards Cisplatin sensitivity using cell lines, mice xenograft models and clinical samples.

Methodology: We used various human and Mice TNBC cell lines, mice xenograft models and clinical samples to uncover role of AKT1/2/3 towards cisplatin treatment. AKT1/2/3 expression was observed in clinical samples (primary and Lung/Liver Met.) of ethnically two different populations from the UK and India. Genetic knockdown of AKT isoforms and pharmacological inhibitors were used during detailed understanding of mechanism of Cisplatin sensitivity vis-à-vis AKT isoforms.

Results: Amongst the clinical samples of UK and India, higher expression of AKT1 was observed in primary tumor tissues, whereas lung and liver metastatic samples displayed elevated expression of AKT2. Genetic modulation of the expression of AKT isoform in cell lines displayed the role of AKT2 with invasive and migratory, and stemness properties. Cell line and mice xenograft studies revealed that loss of expression of AKT1 isoform is associated with reduced sensitivity towards cisplatin treatment. The decrease in cisplatin treatment response in AKT1 knockdown cells was allied with the upregulation in the expression of transporter protein ABCG2. Our further detailed experiments suggests that knockdown of AKT1 (shAKT1) cells acquire EMT and cisplatin resistance through AKT/Snail/ABCG2 axis. Further experiments revealed that knockdown of Snail in combination with knockdown of AKT1 cells and PARP-1 cleavage thereby overcomin resistance in shAKT1 cells.

Conclusion: Studies demonstrated the varied expression of AKT1/2/3 in TN breast cancers primary and metastatic patient samples across ethnicities. It has been demonstrated that expression of AKT2/Snail/ABCG2 axis is found increased during silencing AKT1 expression, while overexpression of AKT1 negatively correlates the expression of ABCG2/Snail, thus rendering cells sensitive to cisplatin mediated death. Studies suggest that the analysis of the expression of AKT isoforms can be predictive marker for the treatment choice of cisplatin and can offer useful information for its personalized use in patients.

No conflict of interest.

259 (PB-084) Poster
The combination of platelet-to-lymphocyte ratios with TIL assessment as prognostic factor for patients with triple negative breast cancer
Background: Tumor infiltrating lymphocytes (TILs) are a prognostic marker in breast cancer and high TIL infiltration correlates with better patient outcomes. Meanwhile, parameters involving immune cells in peripheral blood have also been established as prognostic markers. High platelet-to-lymphocyte ratios (PLRs) and neutrophil-to-lymphocyte ratios (NLRs) are related to poor outcomes in breast cancer, but their mechanisms remain unknown. To date, TILs and these parameters have been examined separately.

Material and methods: We investigated the relationship between TILs and the peripheral blood markers, PLR and NLR, in the same patients, using surgical specimens from 502 patients with invasive breast carcinoma without pre-operative chemotherapy.

Results: A positive correlation between PLR and TIL was observed in tripe-negative breast cancer (TNBC) (P = 0.013), while no significant relationship was observed in other subtypes. TNBC patients had different patterns of outcomes according to TIL and PLR, with the TIL-high/PLR-low group having the lowest rate of disease relapse and death, and the longest distant metastasis-free and overall survivals, while the TIL-low/PLR-high group had the shortest survival.

Conclusions: The combination of PLR with TIL assessment may enable more accurate prediction of patient outcomes with TNBC.

No conflict of interest.

261 (PB-085) Poster
HER2-low versus HER2-0 in Invasive Lobular Breast Carcinoma
M. Fontes-Sousa1, L. de Sousa5, L. Ribeiro1, S. Pinto Torres1, D. Alçâm Costa1, C. Gama Pinto1, L. Mestre2, P. Borralho1, A. Raimundo1, I. Negreiros1, CUF Lisbon Breast Unit, Medical Oncology, Lisbon, Portugal;1NOVA Lisbon University, NOVA Medical School, Lisboa, Portugal;2CUF Lisbon Breast Unit, Breast Surgery, Lisboa, Portugal;3Hospital CUF Descobertas, Pathology, Lisboa, Portugal;4CUF Oncology, Medical Oncology, Lisboa, Portugal
Background: Invasive Lobular Carcinoma (ILC) accounts for 8 to 15% of all invasive breast cancers and has distinctive biological features. Emergent data and the first positive trial targeting human epidermal growth factor receptor 2 low (HER2-L) tumors underscore its relevance. HER2-L is defined as immunohistochemical HER2 1+ or 2+ with negative in situ hybridization. The objective of the study was to review institutional cases of ILC and analyze clinically relevant variables according to HER2-L or HER2-0 status.

Abstracts, EBCC-13
**Material and methods:** All consecutive ILC patients treated at a Breast Cancer Unit in Lisbon, whose data was retrieved from clinical files, were considered for analysis over a 10-year period (Jan-2011 to Apr-2022). SPSS was used for statistical analysis and p < 0.05 was established for significance. The study was approved by the local Ethics Committee.

**Table:** Data regarding studied variables according to HER2 subgroups.

<table>
<thead>
<tr>
<th>Variables</th>
<th>HER2-Low (n = 98)</th>
<th>HER2-Negative (n = 53)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (years) at diagnosis</td>
<td>61 (35–93)</td>
<td>56 (42–87)</td>
<td>NS</td>
</tr>
<tr>
<td>Stage*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>51 (52%)</td>
<td>25 (47%)</td>
<td>NS</td>
</tr>
<tr>
<td>II</td>
<td>25 (26%)</td>
<td>21 (40%)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>16 (16%)</td>
<td>6 (11%)</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>6 (6%)</td>
<td>1 (2%)</td>
<td></td>
</tr>
<tr>
<td>Histological grade</td>
<td>0.037</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>4 (4%)</td>
<td>5 (10%)</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>78 (83%)</td>
<td>45 (86%)</td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>12 (13%)</td>
<td>2 (4%)</td>
<td></td>
</tr>
<tr>
<td>Breast conservative surgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pN+</td>
<td>23 (25%)</td>
<td>18 (34%)</td>
<td>NS</td>
</tr>
<tr>
<td>with extracapsular invasion</td>
<td>9/23 (39%)</td>
<td>11/16 (61%)</td>
<td></td>
</tr>
<tr>
<td>Dis appearing within tumor</td>
<td>16 (70%)</td>
<td>11 (61%)</td>
<td></td>
</tr>
<tr>
<td>Chemotherapy (Neo or adjuvant)</td>
<td>37 (38%)</td>
<td>14 (27%)</td>
<td></td>
</tr>
<tr>
<td>Postmenopausal status with hormonal replacement therapy</td>
<td>70 (71%)</td>
<td>31 (59%)</td>
<td>NS</td>
</tr>
<tr>
<td>Positive family cancer history*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrence</td>
<td>32 (39%)</td>
<td>35 (70%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>before 36 months follow-up</td>
<td>5 (5%)</td>
<td>1 (2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Death</td>
<td>4 (80%)</td>
<td>1 (100%)</td>
<td></td>
</tr>
<tr>
<td>NS: not significant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*Respective AJCC stage at diagnosis (7th or 8th edition according to the year)

**Results:** A total of 164 patients were identified, all female. HER2 positive tumors (n = 8) and cases reported solely as HER2-negative (n = 5) were excluded. Of the included 151 patients, 98 (65%) were HER2-L and 53 (35%) were HER2-0. The median age at diagnosis was 59 years old and the median follow-up was 36 months. Estrogen and Progesterone receptors positivity (median 95%) and Ki67 (median 15%) were similar in both groups. Selected variables are shown below. Of note, a positive family history of cancer appeared to have a correlation with HER2-0 (p < 0.001), but no further germline genetic information was available.

**Conclusions:** ILC has a slightly higher HER2-L percentage (65%) than reported in the literature for invasive breast carcinoma (estimated 50–60%), thus being an attractive HER2-L target for therapy. This is relevant in early recurrences, as most occurred before the 3rd year since diagnosis. Despite being a retrospective study, we found that most clinically relevant variables were similar between the HER2-L and HER2-0 populations, with the exception of family history of cancer and histological grade.

**Conflict of interest:**
Advisory Board: AstraZeneca, Daiichi-Sankyo, Gilead, MSD, Novartis, Pfizer, Roche
Other Substantive Relationships: Roche

**Background:** Inflammatory Breast Cancer (IBC) is a rare, but highly aggressive variant responsible for 10% of breast cancer related mortality. X-linked inhibitor of apoptosis protein (XIAP) can suppress immune-mediated tumor cell death by its ability to inhibit caspase activity, granulocyte release, and activate NFkB and MAPK inflammatory crosstalk signaling. In this study we wanted to assess the pattern of expression of XIAP and to delineate the associated changes in the tumor immune microenvironment (TIME) for prognostic value in invasive breast cancers including inflammatory breast cancer (IBC).

**Material and methods:** Spatial localization of immune subsets and expression of XIAP and PDL1 were analyzed by immunohistochemistry on pretreatment tumors from 81 IBC and 61 subtype-matched NBC patients. Results were validated by CIBERSORT analysis of immune cell signatures with XIAP protein and mRNA expression.

**Results:** XIAP expression was qualitatively graded as 0 (negative) to 3+ (strong) in tumor cells and dichotomized for statistical analysis as low (≤1) and high (>1). High XIAP in 37/81 IBC correlated significantly with high PD-L1, increased infiltration of FOXP3+ Treg, CD163+ tumor associated macrophages, and a low CD8/CD163 ratio in both tumor stroma (TS) and invasive margins (IM). Differential subsets of higher CD8+ T cells and CD79a+ B cells in the IM were observed in high XIAP-nBC TIME. Additionally, gene set enrichment analysis identified cellular stress response- & inflammation-related genes in high XIAP-IBC. Although high XIAP expression was not associated with a worse outcome in most groups, we surprisingly observed a correlation between high XIAP and better OS (HR: 0.44, 95%CI: 0.20–0.99, P = 0.04) in non-metastatic IBC patients.

**Conclusions:** This is the first study using immunophenotyping and gene expression data to demonstrate a strong association between high XIAP and an immunosuppressive TIME in IBC. Overcoming the upregulation of XIAP during cellular stress may counter immunosuppressive signaling. Therefore, further investigation of combinatorial strategies of immunotherapeutics with XIAPiAP antagonists is warranted and has the potential to improve clinical outcomes in IBC and other aggressive breast cancer subtypes.

**No conflict of interest.**

**Poster Session Abstracts, EBCC-13**
Results: RT-qPCR results of ESR1 were highly concordant with IHC with OPA 95.5% using 1% cut-off. The OPA and NPA between RT-qPCR and IHC for PR was 94.4% and 80.0% respectively. Using the Altred Score for ER and PR (with 3/8 or more defined as positive), the OPAs were 94.7% and 88.6% respectively. For ERBB2/HER2, the OPA was 95.5% and the PPA was 84.6%. Best concordance between MKi67 by MammaTyper® and Ki67 IHC was achieved using hot spot digital image analysis (OPA: 87.2%, PPA: 90.6%, NPA:80%). Table 1.

Table 1: Concordance of IHC and MammaTyper®

<table>
<thead>
<tr>
<th>HER2</th>
<th>IHC</th>
<th>OPAs (%)</th>
<th>PPA (%)</th>
<th>NPA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>95.8</td>
<td>95.5</td>
<td>84.3</td>
<td></td>
</tr>
<tr>
<td>1+</td>
<td>94.0</td>
<td>93.6</td>
<td>82.7</td>
<td></td>
</tr>
<tr>
<td>2+</td>
<td>95.0</td>
<td>95.0</td>
<td>87.4</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: RT-qPCR-based assessment of the mRNA expression of ERBB2, ER, and PGR showed high concordance with IHC. MKi67 by MammaTyper® exhibited a higher concordance with the digital Ki67 image analysis. This suggests that MammaTyper® test on needle biopsies represents a reliable, efficient and reproducible alternative for breast cancer 4- marker detection and molecular subtyping.

No conflict of interest.

264 (PB-088)  Poster

Interobserver variation in the assessment of HER2 low expression in breast cancer: can we improve by adjusting criteria? An international interobserver study

X. Baez Navarro1, M.R. van Bockstael2, D. Nawi1, G. Broeckx3, C.G. Colpaert1, S.C. Doebr1, M.C.H. Hogens3, E. Koop1, K. Lambein1, D.J.E. Peeters2, R.H.J.A. Sinke10, J.B. van Brakel11, Saint-Luc, Pathology, Brussels, Belgium3Antwerp University Hospital, Pathology, Antwerp, Belgium4General Hospital Turnhout, Pathology, Turnhout, Belgium5Seraing Gasthuis, Pathology, Hasselt, Belgium6Laboratory Pathology East Netherlands, Pathology, Hengelo, Netherlands7Genee Hospital, Pathology, Apeldoorn, Netherlands8Leuven University Hospital, Pathology, Leuven, Belgium9General Hospital Sint-Maarten, Pathology, Mechelen, Belgium10Pathan BV, Pathology, Rotterdam, Netherlands11Skåne University Hospital, Pathology, Malmö, Sweden12Isala Clinics, Pathology, Zwolle, Netherlands13University Medical Center Groningen, Department of Pathology & Medical Biology, Groningen, Netherlands14Ghent University Hospital, Pathology, Ghent, Belgium15Radboudumc, Pathology, Nijmegen, Netherlands16Pall Laboratory of Pathology, Pathology, Dordrecht, Netherlands

The immunohistochemical classification of Human Epidermal Growth Factor Receptor 2 (HER2) expression is optimized to detect HER2-amplified breast cancer (BC). However, novel HER2 targeting agents are also effective for BCs with low levels of HER2 expression. This raises the question whether the current guidelines for HER2-testing are sufficient to reproduce the HER2 low BC. The aim of this multicenter international study was to assess the interobserver agreement of HER2 low scoring according to the current American Society of Clinical Oncology/Collaborative of American Pathologists (ASCO/CAP) guidelines. Furthermore, we evaluated whether the agreement improved by redefining the current immunohistochemistry (IHC) scoring criteria, or by adding fluorescent in situ hybridization (FISH).

We performed a two-round study of 105 non-amplified BC. During the first assessment, sixteen pathologists used the latest version of the ASCO/CAP guidelines. After a consensus meeting, the same pathologists scored the same digital slides using modified IHC scoring criteria based on the 2007 ASCO/CAP guideline, and an extra ‘ultralow’ category (incomplete membrane staining at ≤ 10% of the tumor cells) was added.

Overall, the interobserver agreement was limited (κ = 0.63) in the first round, but this was improved by clustering IHC categories. In the second round, the highest reproducibility was seen when comparing IHC 0 versus the group of cluster of ultralow/1+ (74.3% of cases with 100% agreement). The FISH results were not statistically different between HER2 0 and HER2 low cases, regardless of the IHC criteria used.

In conclusion, our study suggests that the modified 2007 ASCO/CAP criteria are more reproducible for HER2 0 cases than the HER2 low cases as compared to the 2018 ASCO/CAP criteria. However, the reproducibility was still moderate, which was not improved by adding FISH data. This could potentially lead to suboptimal selection of patients eligible for novel HER2-low targeting agents. There is a need for clearer, more reproducible IHC definitions and/or development of more accurate methods to detect HER2 low BC.

No conflict of interest.

266 (PB-090)  Poster

Imaging features of malignant lesions in women with PTEN Hamartoma Tumor Syndrome

A. Houthooit1, P. Techanithisawat2, A. Miliants3, R. Mann1, R. Boudoumac, Medical Imaging, Nijmegen, Netherlands;4Queen Sinkt Centre of Breast Cancer, King Chulalongkorn Memorial Hospital, Radiology, Bangkok, Thailand;5Vitaz, Radiology, Sint-Niklaas, Belgium

Background: Women with PTEN Hamartoma Tumor Syndrome (PHTS) have an increased lifetime risk (67–85%) for breast cancer (BC) and are offered breast cancer surveillance. In order to allow for the early diagnosis of BC, knowledge of imaging features of malignant lesions is important. In this study, we thus evaluated the types of malignant lesions encountered and the associated imaging characteristics in women with PHTS who underwent breast cancer surveillance.

Methods: This retrospective single institution study included 39 women with PHTS (aged ≥18 years) who visited the Radboudumc between January 2001 and January 2021. Data were collected from electronic medical records. Surveillance examinations were independently re-read by two radiologists. Surveillance consisted of annual magnetic resonance (MRI) and mammography from age 25 and 30 onwards, respectively.

Results: A total of 14 distinct BCs were diagnosed. Ten BCs were diagnosed by means of imaging (biopsy), while 4 were incidental cancers detected at prophylactic mastectomy. Among the 10 BCs diagnosed by means of surveillance, 9 had MRI examinations available and 1 had only mammography examinations available. Among 3/9 BCs with MRI examinations available, the features were consistently presented with similar irregular shape and margin, fast initial enhancement, plaque or washout in the delayed phase, and no restriction and were all pathologically confirmed as invasive carcinoma of no special type (NOS). Other 5/9 BCs with MRI examinations available were highly concordant with IHC with 100% agreement.

No conflict of interest.

Abstracts, EBCC-13  Poster Session
Conclusions: Imaging features of most BCs were typical of malignancies at mammographic examinations, while mammography examinations were less reliable. We conclude, thus, that the careful evaluation of breast lesions in women with PHTS with multiparametric MRI is essential in order to detect BC early.

No conflict of interest.

267 (PB-091) Poster
Assessment and management of lesions of uncertain malignant potential of the breast at Trieste Breast Unit: a single center experience
S. Scamieri1, M. Fezzi1, T. Federica2, A. Basso3, M. Tonutti3, R. Ceccherini4, F. Zanconali4, M. Bortoli5. 1Breast Unit Trieste, Clinica Chirurigica, Trieste, Italy; 2Breast Unit, Clinica Chirurigica, Trieste, Italy; 3Breast Unit Trieste, SC Radiodagnostica, Trieste, Italy; 4Breast Unit Trieste, Oncologia Senologica OSARP, Trieste, Italy; 5Breast Unit Trieste, SC Anatopia Patologia, Trieste, Italy
Background: Breast lesions of uncertain malignant potential (B3 lesions) represent a heterogeneous group of abnormalities with an overall risk for malignancy of 9.9%–35.1% after total resection. Given their different risk of upgrade to malignancy the management of B3 lesions with the goal of finding the balance between open surgical excision, vacuum guided percutaneous excision and surveillance is still an issue for breast centers.

Materials and methods: We collected data from patients diagnosed with B3 lesions from January 2016 till December 2021 at Breast Unit of Trieste, Italy. We collected data about clinical presentation (symptoms/screen-detection), imaging findings (mammography, ultrasound, magnetic resonance-imaging) and biopsy modality (core biopsy, vacuum assisted biopsy with reference to needle gauge). We registered the management performed for each case (open surgical excision, percutaneous vacuum excision or surveillance), the rate of malignancy upgrade, the positive predictive value (PPV) for each type of B3 lesion. We also compared our B3 management during years 2016–17 and 2018–21 to identify any possible variation referring to respectively First- and Second Consensus conference on management of B3 lesions published those times.

Results: Study population consisted of 316 B3 lesions in patients with median age of 58 years old. 18% patients were symptomatic, the rest were screening detected. Core biopsy was performed in 43.7% of cases, vacuum assisted biopsy was performed in 56.3% of cases. Lesions most frequently diagnosed were Radial Scars (RS) (27.2%), Papillary Lesions (PL) (19.9%), and Atypical Ductal Hyperplasia (ADH) (19.3%). Globally 52.5% of patients underwent surgical excision, mostly because of discordance biopsy/imaging. The positive predictive value was calculated for each type of B3 lesion: ADH showed the highest PPV (25.8%), RS showed the lowest (5.3%). In the present series B3 lesions were predominantly upgradable to ductal carcinoma in situ (DCIS) and low-grade invasive tumors. Among patients who were sent to surveillance instead of surgical or percutaneous excision, at a median follow up of 36 months we registered 3 cases (1.3%) of upgrade to malignancy. None of the patients treated with percutaneous vacuum guided excision evolved to malignancy at follow up. No substantial differences in B3 lesions management was registered among 2016–17 years and 2018–21 years, but a trend towards minimally invasive breast biopsy or percutaneous excision using a vacuum-assisted device was observed.

Conclusions: Lesions of uncertain malignant potential of the breast (B3) are heterogeneous in respect to risk of malignancy, so that their management is still complex and relies on a multidisciplinary approach.

No conflict of interest.

268 (PB-092) Poster
Sonographic assessment of the axilla in breast cancer: changing the threshold
S. James1, V. Chohan2, K. Lim2, M. Rees1. 1ABUHB, General Surgery, Newport, United Kingdom; 2ABUHB, Radiology, Newport, United Kingdom
Background: Ultrasound assessment of the axilla remains an important diagnostic component in the pre-operative investigation of breast cancer, which helps determine the surgical management of the axilla. The threshold to biopsy an axillary node based on its cortical thickness can vary between centres, with no current nationally agreed consensus within the UK. Our centre recently changed its threshold for axillary node biopsy from a cortical thickness of 2.5 mm to 3 mm, based on recent evidence. We retrospectively analysed our own data to assess the potential impact of this change on patient management.

Materials and methods: Data from all patients who underwent an axillary node clearance within the Aneurin Bevan University Health Board, between October 2018 and September 2021, was analysed. Data analysed included patient demographics, pre-operative axillary ultrasound findings and final post-operative histology. Patients who underwent neo-adjuvant chemotherapy were excluded from analysis.

Results: The data of 98 patients was analysed [Median age = 62 years; 96 (98%) female]. Median lymph node cortical thickness was 4.2 mm (1.25–50 mm). The sensitivity for pre-operative detection of lymph node metastases with axillary ultrasound was 93% (n = 125) using the existing cortical thickness threshold of 2.5 mm. With a higher cortical thickness threshold of 3 mm, the estimated sensitivity for pre-operative detection of lymph node metastases was 83% (n = 114, c2 = 0.23, p = ns). Axillary lymph node metastases were found in 18 patients (13%) where the lymph node cortical thickness was <2.5 mm. In patients who were heavily node positive (>4 nodes/N2 disease, n = 50) the sensitivity of the technique improved to 94% (n = 47) independent on whether the cortical thickness biopsy threshold was 2.5 or 3 mm.

Conclusions: Increasing the cortical thickness threshold for pre-operative axillary node biopsy appeared to have a small yet non-significant effect of the sensitivity to detect axillary node metastases. There was no difference observed in the sensitivity to detect patients with heavy nodal disease however, which may be of more value in the future should the publication of ongoing trials, such as POSNOC, continue to support the de-escalation of surgical treatment in the axilla. The methodology used to estimate sensitivity using an alternative cortical thickness threshold in retrospective data may exaggerate the number of false-negative results. Ongoing evaluation of prospective data is therefore key to ensure quality control parameters are maintained.

No conflict of interest.

269 (PB-093) Poster
The utility of virtual clinics in the assessment of patients with mastalgia: a model for breast services post-pandemic?
A. Regan1, M. Rees1. 1ABUHB, General Surgery, Newport, United Kingdom
Background: Mastalgia is a common breast symptom amongst patients, which often prompts referral to breast services. Despite the lack of correlation between mastalgia alone and breast cancer, patients referred to breast clinic with this symptom often report significant anxiety around their visit, due to the worry of a cancer diagnosis. This can be the case as these patients are often seen in a one-stop breast clinic alongside other women with symptoms that are more concerning for breast cancer. We developed a virtual telephone clinic (VTC) to assess patients with mastalgia, outside the one-stop rapid access breast clinic, and assessed the clinics safety and validity in managing this group of patients.

Materials and methods: All patients referred to the breast service with symptoms of mastalgia alone between May - September 2020 were initially assessed via a VTC by a single consultant breast surgeon. During the VTC the patients were assessed and appropriate advice on management was given. At the end of the appointment patients were either reassured and discharged or given an appropriately timed face-face follow-up appointment, based on individual circumstances. Outcomes assessed included: patient demographics, clinic outcomes, waiting times and patient re-attendance rates. The primary outcome was the proportion of patients who were reassured and discharged following a VTC attendance alone. Secondary outcomes included the proportion of patients re-referred to the service within 1 year of initial assessment and any missed cancer diagnoses detected within this time-frame.

Results: 167 patients with mastalgia, and no other breast symptoms, were assessed via a VTC over the time-frame of the study. Median patient age was 39 years (11–91 years) and the majority were female (n = 164, 98%). The mean waiting time from referral to VTC was 68.2 days, however the study period coincided with the onset of the COVID-19 pandemic. The majority of patients were reassured and discharged after the VTC appointment alone (n = 107, 64%) and all patients were discharged after a single subsequent face-face follow-up appointment when needed. Reasons for patients requiring a face-face appointment after the VTC included patient anxiety (n = 10, 17%), the fact that the patient had not had a breast examination performed in primary care (n = 40, 66%) and additional symptoms reported by the patient during the virtual consultation (n = 10, 17%). Re-attendance rate within 1 year was low at 6.2% and there were no cases of a missed breast cancer identified within this time frame.

Conclusions: Virtual clinics appear to be a safe and valid method for assessing patients who present to the breast service with mastalgia, and no other breast symptoms. Patient reported outcome measures are currently being sought to ensure the patient satisfaction of this service is also maintained at high levels.

No conflict of interest.
The development of an interactive online referral tool for breast services in Wales: optimising the patient referral pathway

S. Golobor 1, S. James 1, A. Regan 1, M. Rees 2, Liverpool University; 1Medicine, Liverpool, United Kingdom; 2ABUHB, General Surgery, Newport, United Kingdom

Background: The appropriate utilisation of referral pathways is an important component in optimising the function of any cancer service. Lack of knowledge and understanding of existing pathways and accepted guidance by users of the system can have a negative effect on the performance of that system, and may also negatively impact patient experience. We audited appropriate utilisation of existing service pathways by assessing referrals from primary care to breast services. The response to this has led to the development of an online breast service prioritisation tool, which aims to maximise compliance with existing national referral guidelines, thus improving the efficiency of the breast service for our patients.

Materials and methods: All referrals to the breast service from primary care were assessed over a 1 month period. Referrals were prioritised as Urgent Suspected Cancer (USC), Urgent or Routine by the referrer and each referral was subsequently reviewed by a consultant breast surgeon who could either accept the referral at its existing priority level, or regrade the referral based on its compliance with national guidance. The online "ABUHB Breast Service Prioritisation Tool" was subsequently created using third party software (https://ztree.ai/706811498). The tool functions as an interactive decision aid for users, and uses accepted national and regional guidelines alongside existing referral pathways within the breast service to optimise clinical decision making. Since the tools development, user feedback has been sought using a standardised questionnaire.

Results: A total of 684 referrals to the breast service was received from primary care in a single calendar month (June 2022). The majority of the referrals were prioritised as USC by the referring practitioners (n = 464, 68%), while urgent (n = 131, 19%) and routine (n = 89, 13%) referrals were less frequent. After consultant review, the priority for most referrals was not changed (n = 390, 57%) but there were a significant number of referrals where the priority was either downgraded (n = 171, 25%) or upgraded (n = 123,18%) respectively. User feedback since the development of the prioritisation tool (n = 44) has been positive with 87.5% of respondents stating the tool is useful, 97.5% stating the tool is either easy or very easy to use, and 97.5% of respondents said they would use the tool when making a referral to the breast service at least some of the time.

Conclusions: Optimising referral priority and the use of referral pathways is an important component of a well functioning cancer service, and our results demonstrate there is scope for improvement. The online referral prioritisation tool has received positive feedback from users to date and its effect on improving compliance with current guidelines will be assessed as the tool goes live over the next 12 months.

No conflict of interest.

Morphometric analysis of ductal carcinoma in situ identifies features associated with low risk of progression to invasive breast cancer

M. Leite 1, X. Melillo 1, N. Lam 1, S. Vonk 1, B. de Bruijn 1, J. Sanders 1, M. Almekinders 2, S. James 2, Liverpool University; 1Netherlands Cancer Institute, Molecular Pathology, Amsterdam, Netherlands; 2Consultant Histopathologist, Honorary Lecturer, Manchester Foundation trust, Manchester M23 9LT, United Kingdom

Background: Ductal carcinoma in situ (DCIS) is a potential precursor of invasive breast cancer (IBC). However, the majority of DCIS will never progress to IBC if left untreated. As almost all DCIS are treated by surgery or conserving surgery alone (n = 689) and average follow-up of 12 years. Patients diagnosed with subsequent ipsilateral IBC (iIBC) were assigned as cases, while those without iIBC as controls. HE stained slides of DCIS lesions were scanned and uploaded to HALO software (indica.labs) for tissue and cell classification based on artificial intelligence algorithms. DCIS ducts were manually annotated by an expert pathologist in 97 HE sections. Annotations were used by an advanced deep learning neural network to create a train-by-example tissue classifier. We obtained the area, perimeter and spatial coordinates of DCIS ducts, the nucleus of DCIS cells and stroma area. Data was exported to R-studio, and extra morphometric variables were calculated, such as: DCIS/stroma area ratio, cell density, duct circularity and minimal distance between DCIS ducts or between nuclei.

Results: Detection of DCIS ducts by the HALO classifier showed a high agreement with pathologist: kappa agreement = 0.80 (0.68−0.92 95% CI), DCIS tissue and cell classifiers were applied on 226 cases and 463 controls. After linear univariate regression analysis, several morphometric values were associated with lower risk of progression to invasive, such as: lower DCIS/stroma ratio, odds ratio (OR) = 0.84 (0.74–0.95 95% CI, p = 0.003); lower number of DCIS cells/duct, OR = 0.80 (0.68−0.94 95% CI, p = 0.007); shorter duct diameter, OR = 0.58 (0.38–0.88 95% CI, p = 0.011); and less circular duct shape, OR = 0.49 (0.24–0.97 95% CI, p = 0.043). The association of the last two variables remained significant after multivariate regression model with pathological and molecular co-variables (i.e., histopathological grade, COX2 and HER2 expression): shorter duct diameter, OR = 0.51 (0.29–0.91 95% CI, p = 0.023) and less circular duct shape, OR = 0.33 (0.13–0.78 95% CI, p = 0.012).

Conclusions: Morphometric features are promising to distinguish harmlessly from potentially hazardous DCIS and could guide personalized treatment decisions in the near future. We demonstrated that geometry and density of DCIS ducts and cells in HE-sections are associated with outcome. External validation of these associations is ongoing.

No conflict of interest.

Pathways UK survey: Pathology perceptions on current biomarker testing and pathways for breast cancer in England

P. Tanier 1, A.G. Nicholson 2, J. Gosney 3, L. Joseph 4, E. Shaw 5

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Background: The PATHways survey aimed to capture pathologists’ perspectives on current diagnostic pathways, the increasing role of molecular diagnostic tests, and improvements opportunities for optimising pathways to ensure equitable and timely access. Here we report the results for breast cancer (BC) testing.

Materials and Methods: A nationwide survey was conducted (Jan-Mar 2022) with consultant pathologists at regional laboratories in England, using a structured questionnaire. Descriptive analysis (by OPEN Health) was performed with quantitative and qualitative methods.

Results: Fifteen centres, each covering a median (IQR) population of 2.5 (1.9–3.6) million, completed the survey. Technologies available in-house included IHC (15/15), RT-PCR (9/15), FISH (4/15), sanger sequencing (2/15) and NGS (2/15) while biomarker testing was also performed in coordination with external labs and genomic laboratory hubs (GLHs). The most common challenge for implementing new tests was funding/resource allocation (13/15). Median (IQR) estimated BC samples received per month was 130 (40–425) and NGS (12/15) was also performed in coordination with external labs and genomic laboratory hubs (GLHs). Educational support suggested for pathologists included understanding new pathways and best practice sharing. Patient information, report interpretation and tissue requirements were among the educational support advised for clinicians.

Conclusion: Our survey demonstrated that HR, PgR and HER2 were routinely tested for BC diagnosis but not consistently across the UK. Other molecular testing was performed routinely at this time, with PIK3CA testing nationally commissioned since April 2022. Recommendations from this survey on logistical and technical challenges will help inform existing and
new pathway optimisation, supporting equitable treatment planning across all regions.

Conflict of interest:
Corporate-sponsored Research:
Funding: The PATHways survey was organised and funded by Novartis Pharmaceuticals UK Ltd.
Other Substantive Relationships: Phillippe Taniere reports consultancy for AstraZeneca, Roche, Boehringer Ingelheim and Qiagen.
Andrew G. Nicholson reports receiving personal fees from Merck, Boehringer Ingelheim, Novartis, AstraZeneca, Bristol-Myers Squibb, Roche, AbbVie, Oncologica, Uptodate, European Society of Oncology, Librum, and Takeda UK and grants and personal fees from Pfizer, outside of the submitted work. John Gosney received grants from the Medical Research Council (MRC) and Eli Lilly and Company, and personal fees from AbbVie, AstraZeneca, Boehringer Ingelheim, Bristol-Myers Squibb, Dialectics, Eli Lilly and Company, Merck Sharp & Dohme, Novartis, Pfizer, Roche and Takeda Oncology outside the submitted work.
Leena Joseph and Emily Shaw have no conflict of interest.
Adrienne G. Lanctot, Rozinder Bains and Jacqueline Ryan are employees of Novartis Pharmaceuticals UK Ltd.

273 (PB-097) Poster
Real-world use of multigene signatures in early breast cancer: the experience by the Lombardy Genomic Assays for Breast Cancer Working Group
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Background: Multigene assays (MGAs) are extremely useful tools for tailoring adjuvant chemotherapy (CT) in ER+/HER2- EBC. In July 2019, Lombardy was the first Region in Italy to reimburse MGAs for patients (pts) with formal indication to receive adjuvant CT after multidisciplinary discussion. Here, we report real-world MGAs experience in 6 referral Cancer Centers in Lombardy.

Methods: Oncotype DX was the preferred test in 97% of cases and only test used in 5 Centers. We selected consecutive pts tested with Oncotype DX from July 2020 to July 2022. The distribution of clinical-pathologic features and RS groups (low RS 0–25 or high RS 26–100) was assessed using Chi-Square. We also compared the distribution of clinical-pathologic features and RS with those in the TAILORx and RxPONDER trials.

Results: We identified 1098 pts. Breakdown of clinical-pathologic features by RS score is summarized in the table.
Background: Preoperative axillary staging with physical examination and/or axillary ultrasound is an important tool to determine the loco-regional extent of breast cancer. The aim of this study was to compare the false-negative rates of different axillary staging methods in patients with invasive breast cancer.

Materials & Methods: Data from the Netherlands Cancer Registration were used, which consisted of women with newly diagnosed invasive breast cancer between January 2011 and December 2021. The prevalence of false-negative pathological node-positive status (pN > 0) was compared between clinically node-negative breast cancer patients with or without axillary staging. In addition, logistic regression was used to estimate the association between axillary staging and false-negative pN status.

Results: In total, 83,152 female patients were included of which 16.7% were diagnosed with ILC and 83.3% were diagnosed with IDC. The prevalence of a pN > 0 status was significantly higher in patients with ILC vs. patients with IDC (25.6% vs. 22.4%, p < 0.001). Invasive lobular carcinoma (β = 0.245, p < 0.001), upfront surgery (β = 0.99, p < 0.001) and a higher clinical tumor status (β = 2.40, p < 0.001) were associated with a higher false-negative pN status.

Conclusions: Preoperative staging with physical examination and/or axillary ultrasound showed significantly more false-negative pathological node-positive status rates in IDC compared to those with ILC. ILC and higher clinical tumor status (cT) were associated with a higher pN status as well as upfront surgery. The consequences of these findings are subject of further research.

Table 1: Baseline Patient and Tumor Characteristics

<table>
<thead>
<tr>
<th>Total population (N)</th>
<th>ILC (N = 83,152)</th>
<th>IDC (N = 69,301)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD)</td>
<td>61.8 (11.6)</td>
<td>63.5 (11.2)</td>
</tr>
<tr>
<td>cT stage, N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tis</td>
<td>1637 (19.7)</td>
<td>117 (0.8)</td>
</tr>
<tr>
<td>T0</td>
<td>148 (0.2)</td>
<td>38 (0.3)</td>
</tr>
<tr>
<td>T1</td>
<td>57,333 (68.9)</td>
<td>7,528 (54.3)</td>
</tr>
<tr>
<td>T2</td>
<td>19,961 (24)</td>
<td>4,690 (33.9)</td>
</tr>
<tr>
<td>T3</td>
<td>2,150 (2.6)</td>
<td>1,147 (8.3)</td>
</tr>
<tr>
<td>T4</td>
<td>472 (0.6)</td>
<td>116 (0.8)</td>
</tr>
<tr>
<td>pN stage, N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N0</td>
<td>61,111 (73.5)</td>
<td>9,914 (71.6)</td>
</tr>
<tr>
<td>N1</td>
<td>17,336 (20.8)</td>
<td>3,115 (22.5)</td>
</tr>
<tr>
<td>N2</td>
<td>791 (1.0)</td>
<td>236 (1.7)</td>
</tr>
<tr>
<td>N3</td>
<td>281 (0.3)</td>
<td>130 (0.9)</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>64,493 (77.6)</td>
<td>10,486 (75.7)</td>
</tr>
<tr>
<td>Preoperative</td>
<td>3,869 (4.7)</td>
<td>823 (5.9)</td>
</tr>
<tr>
<td>Postoperative</td>
<td>14,657 (17.6)</td>
<td>2,514 (18.2)</td>
</tr>
<tr>
<td>Both</td>
<td>133 (0.2)</td>
<td>28 (0.2)</td>
</tr>
</tbody>
</table>

cT = clinical tumor stadium; pT = pathological tumor stadium; pN = pathological node stage; ALND = axillary lymph node dissection

No conflict of interest.
perceived diagnostic accuracy and necessity of either US or DBT. Also, women expressed their doubts about the targeted focus of US on the symptomatic area, emphasizing the strength of bilateral DBT for the evaluation of the whole breasts. Theme four, emotional impact, highlights the stress associated with the diagnostic period and how women feel reassured by each modality in various extents. Lastly, the theme costs describes the potential saving of individual and societal costs when performing US only, protocols reflects women’s experiences with adherence to guidelines and privacy is about women’s issues with privacy violation.

Conclusions: Both modalities seem to have advantages as well as drawbacks according to the women. Knowledge of patients’ perceptions of the exams can be of great value to general practitioners, radiographers and radiologists, as they can take this into account when women need to undergo diagnostic imaging.

No conflict of interest.

277 (PB-101) Poster
ERBB2 mRNA expression in HER2-low breast cancer

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Background: Trastuzumab deruxtecan significantly increased progression-free survival over the overall median duration of the chemotherapy for the HER2-low breast cancer (BC) patients, which opened a new chapter in the treatment of HER2-low BC. However, the ability of traditional immunohistochemy to distinguish HER2-0 and HER2-low was questioned and some low, and 20 cases were evaluated inconsistently for HER2-0 or -low by three pathologists with MammaTyper ® results.

Methods: ERBB2 mRNA level of formalin-fixed, paraffin-embedded BC post-surgery specimens with HER2 negative status via immunohistochemical-FISH confirmed by three pathologists were detected by MammaTyper® quantitative allele specific polymerase chain reaction (qRT-PCR) kit. The consistency of HER2 immunohistochemistry scoring by three pathologists were analyzed by interclass correlation coefficients (ICC), and compared with MammaTyper® results.

Results: 177 cases were included. The ICC value of three pathologists assessed for HER2-0 vs. HER2-low is 0.934. However, among these 177 cases, 42 cases were unanimously rated as HER2-0, 115 cases as HER2-low, and 20 cases were evaluated inconsistently for ERBB2 might not benefit from the new anti-HER2 treatment. High mRNA expression of ERBB2 partially explained the response to T-DM1 in HER2 positive breast cancer, which brings up the possibility of precise detection of mRNA expression of ERBB2 to define HER2-low cohort and its guidance on drug administration.

Conclusions: The ERBB2 mRNA level of formalin-fixed, paraffin-embedded BC post-surgery specimens with HER2 negative status via immunohistochemical-FISH confirmed by three pathologists were detected by MammaTyper® quantitative allele specific polymerase chain reaction (qRT-PCR) kit. The consistency of HER2 immunohistochemistry scoring by three pathologists were analyzed by interclass correlation coefficients (ICC), and compared with MammaTyper® results.

No conflict of interest.

278 (PB-102) Poster
Triple negative breast cancers: Rising menace in the developing world and treatment challenges

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Upcoming reports suggest rising incidence of breast cancers in the developing world. Young patients with Triple negative breast cancers (TNBC) constitute an important problem statement, often with heterogeneous management in all regions.

Materials and Methods: Prospectively maintained database in the department of Breast Oncology was screened. All ladies with TNBC and presenting to the out-patient clinic were included.

Results: 616 patients diagnosed with TNBC and managed at the centre were identified. Median age at diagnosis was 48 years. The age distribution was as follows: less than 30 years – 5.4%, 31–40 years – 20.7%, 41–50 years – 33.5%, 51–60 years – 25.2%, 61–70 years – 12.2% and more than 70 years – 3.1%. At presentation, 358 (58.2%) patients, 129 (21.0%) patients, 47 (7.6%) patients and 75 (12.2%) patients were treatment-naive, had inadequate index surgery, were completely treated, had partial treatment outside respectively. Young patients (less than 50 years) were more likely to be referred after an inadequate index surgery or partial treatment to tertiary care (p < 0.001). Amongst patients presenting with de-novo disease, patients presented in following stages – II (76, 21.2%), III (201, 56.1%), IV (73, 20.4%). In Stage IV, 29 patients (8.1%) were diagnosed as oligometastatic and treated with curative intent. Of patients treated with curative intent (n = 302), 218 (72.2%) received neoadjuvant chemotherapy (NACT) while the remaining 84 (27.8%) were operated upfront. 37 of 218 (16.9%) patients had progression on NACT, while 38 (17.1%) patients had stable disease. Amongst patients undergoing surgery (n = 265), only 21.5% underwent breast conservation surgery. Low axillary sampling was done in 24 patients (9%). In remainder, axillary staging showed level II involvement in 13 patients (4.3%) level III involvement in 25 patients (9.4%) and Illc involvement in 12 patients (4.5%). Pathological complete response was seen in 111 patients (41.8%) and it has significant association with the number of chemotherapy cycles received, and taxanes as a part of NACT (p < 0.05). Median follow up was 13 months. Recurrence was seen in 61 patients during the study period, in following places: visceral – 27 (44.3%), loco-regional – 19 (31.14%), skeletal – 7 (11.5%) and CNS – 8 (13.1%).

Conclusions: Significant proportion of patients present to the tertiary centre after an inadequate preliminary treatment elsewhere. This has important management implications for the high-risk subgroup of young TNBC patients who demand timely management for best outcomes. Timely referral from community and wider utilization of systemic therapy as NACT is required to possibly improve the treatment outcomes in this cohort. This may also reduce the extent of surgical treatment leading to more breast conservation surgeries.

No conflict of interest.
moribidity may be more causally associated with worse OS that treating co-

morbidity may improve prognosis.

No conflict of interest.

280 (PB-104) Poster
Clinicopathological Risk Factors of Brain Metastasis in Breast Cancer Patients: A Systematic Review and Meta-analysis
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Background: Breast cancer brain metastasis (BCBM) has an incidence rate of 6.1% among Breast Cancer (BC) patients. In BCBM, cancerous cells come from a primary tumor that implant and grow in the brain leading to potentially lethal neurologic symptoms and signs. With more clinical options and therapeutics strategies becoming available, a multi-disciplinary approach for treatment is needed in order to best meet BCBM patients’ needs, however, systemic guidelines for the screening of high-risk asymptomatic patients are still lacking and the BCBM diagnoses are performed only after symptoms manifestation. Therefore, understanding the clinical and pathologic drivers of BCBM aids in improving medical interventions by guiding future research directions. The aim of this study is to determine the clinicopathological risk factors of brain metastasis (BM) among BC patients.

Methods: Retrospective cohort studies on the clinicopathological characteristics of BM versus non-BM (NBM) patients were retrieved through reputable search databases. Review Manager version 5.4.1 was used for statistical analyses. In the presence of heterogeneities, a pragmatic approach was undertaken to employ both random-effects (RE) and fixed-effect (FE) meta-analyses. The statistical significance of the pooled effect estimates was examined by the Z-test. Intersudy variations and heterogeneities were estimated using Cochrans’s Q-statistic with P < 0.05 indicating a statistically significant heterogeneity. The risk of bias and the quality of studies were assessed at a study level using ROBINS-I tool.

Results: A total of four (4) retrospective cohort studies were included in the analyses. Random-effects meta-analyses with \( i^2 < 50\% \) (P > 0.05) had shown significant association (P = 0.05) on the increased incidences of BCBM development for HER2+ expression [OR: 2.43, 95% CI: 1.88–3.12, P < 0.00001] and for pre-menopausal status [OR: 1.77, 95% CI: 1.13–2.76, P = 0.01]. Fixed-effect meta-analyses had shown significant association (P < 0.05) on the decreased incidence of BCBM development for TNBC disease [OR: 0.66, 95% CI: 0.47–0.92, P = 0.02]. The risk of bias was low to moderate in the majority of studies.

Conclusion: HER2 positivity and pre-menopausal status are risk factors for increased BCBM development while the absence of regional lymph node metastases and ILC findings are less likely to progress to BCBM. Higher T and N categories, higher histological grade, ER negativity, and PR negativity may be associated with higher risks of BCBM while lower T categories, HER2 positivity, and ER positivity may be associated with less BCBM development.

More powerful relevant and upcoming randomized clinical trials with larger sample sizes among BCBM patients versus non-BM patients must be made exploring certainty on the clinicopathological factors contributing to BM among BC patients.

No conflict of interest.

281 (PB-105) Poster
Use of frailty measurements in observational studies on older patients with breast cancer: A systematic review
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Background: Among women, breast cancer (BC) is the most frequently diagnosed cancer and is ranked as the leading cause of cancer death. Given that aging is one of the strongest risk factors for the development of breast cancer, older adults (65+) are disproportionately affected. At the same time, more than half of older cancer patients are considered frail or pre-frail and are at increased risk of adverse outcomes including treatment intolerance, as well as morbidity, and mortality. Frailty is thus recognized as an important metric to guide decision-making in geriatric oncology. This study characterizes the use of frailty measurements in observational studies on older women with breast cancer.

Materials and Methods: MEDLINE, EMBASE, and Cochrane Library were systematically queried to identify observational studies (cohort, case-control, cross-sectional) on older women with breast cancer which evaluate survival or mortality before or after treatment, published from 2017–2022. Studies were managed using Covidence software and assessed for inclusion with predefined criteria by independent reviewers. Data was extracted with respect to the characteristics of the studies. Frailty measurements were identified, the proportion of studies using frailty measurements was calculated, and the prevalence of frailty among BC patients was determined.

Results: A total of 9823 studies were screened on title and abstract after deduplication. Based on specified criteria, 217 full text studies were assessed for eligibility, 71 of which were excluded, mainly due to incorrect target population with respect to age, or incorrect outcome assessment. Overall, 146 studies were included. Preliminary results revealed that frailty status was not considered in all identified observational studies. Among studies that measured frailty, a relevant proportion of female BC patients were considered frail. Detailed results will be shown at the conference.

Conclusion: Despite having significant prognostic importance, the use of frailty measurements is not a compulsory practice in observational studies on breast cancer in older women. Additionally, although multiple frailty screening tools have been developed, there is no gold standard measurement used to detect frailty. As a result of such heterogeneity in clinical practice, an established definition of frailty and its evaluation criteria is imperative. Although surgery removes the mammary gland, there is a risk of developing local recurrence of 2–9.5% according to the literature. The residual tissue is usually between 5 and 15% and this is found in 21–76% of mastectomy cases. The objective of this study is to analyze the rate of local recurrence after mastectomy, as well as its risk factors and the method by which they are diagnosed to test the follow-up protocol.

Material and Methods: A retrospective observational study of breast cancer patients who underwent mastectomy between 2000 and 2020 was conducted. A total of 929 mastectomies were performed in our hospital. Of 809 remaining cases, a local recurrence was observed in a total of 51 mastectomy patients. We studied the main variables for our comparative statistical analysis, we analyzed risk factors for local recurrence and overall survival with a 15-year follow-up.

Results: 772 patients with breast cancer were analyzed, of which 6% of the total presented local recurrence. 43% of the patients who presented local recurrence died (p < 0.001). 52% of the diagnoses were made by detecting a palpable mass or by physical exam. 47% occurred in residual tissue, 17% in the same breast that underwent surgery, and 23% in the skin scar. When we compared the risk factors with the appearance of local recurrence, a significant association was obtained with axillary involvement in the final surgical piece (P = 0.004) positive axillary lymphadenectomy (p = 0.012), triple negative histological subtype (p = 0.002) and negative progesterone receptors (p = 0.04). After univariate Cox regression analysis, it was observed that the risk of local recurrence increased when positive lymph nodes were obtained in the piece (p = 0.006) and if the axillary lymphadenectomy was positive (p = 0.015). Survival at 5 years after diagnosis was 8% among patients with local recurrence versus 88% who did not recur. Survival at 10 years drops to 63% if local recurrence is diagnosed and 78% if it is not diagnosed (p = 0.008). The presence of local recurrence showed statistically significant differences with breast cancer mortality (p = 0.009).

Conclusions: Local recurrence rate after mastectomy was 6%, 17% from the ipsilateral residual breast tissue and 23.5% from the wound. The detection of affected lymph nodes in the surgical specimen, positive axillary lymphadenectomy patients and the triple negative subtype were shown to be risk factors for local recurrence while positive progesterone receptors is a protective factor. Given the high mortality in patients diagnosed with local recurrence of breast cancer, the detection of risk factors associated with its...
Background: Depression and anxiety may increase the risk of breast cancer through immune suppression, inhibited DNA repair or unhealthy behavior. In contrast, depression and anxiety may be related to lower estrogen levels, which may decrease the risk of breast cancer. This protective mechanism may specifically play a role in premenopausal women. We examined whether the association between depression and anxiety and breast cancer incidence differed between pre- and postmenopausal women.

Materials and methods: We performed two-stage individual participant data meta-analyses based on nine prospective cohorts of the PSY-CA consortium (N = 162,155; person years (PY) = 1,594,085, breast cancer incidences = 3,381). We considered depression and anxiety diagnoses and symptoms. Menopausal status was self-reported. In each cohort we examined the relation between each predictor and breast cancer incidence using Cox regression. Analyses were performed in pre- and postmenopausal women separately. We tested for effect modification by menopausal status in the total sample. Models were adjusted for sociodemographic factors (minimally-adjusted model) and other confounders (maximally-adjusted model). Effect estimates were pooled using random-effects meta-analyses.

Results: In minimally-adjusted models, depression diagnosis and symptoms were not associated with breast cancer incidence. We found non-significant opposite associations of depression diagnosis with decreased risk of breast cancer in premenopausal women (HR = 0.91, 95%CI:0.70;1.18) and with increased risk in postmenopausal women (HR = 1.11, 95%CI:0.75;1.64), but there was no effect modification by menopausal status (Relative Excess Risk due to Interaction (RERI) = 0.30, 95%CI: -0.70;1.18) and with increased risk in postmenopausal women (HR = 1.11, 95%CI:0.75;1.64).

Conclusions: We found no evidence for differential relations between depression, anxiety and breast cancer incidence in pre- and postmenopausal women. The potential preventive effect of anxiety on breast cancer incidence deserves further attention.

Conflict of interest: No conflict of interest.

Table: Depression and anxiety and risk of breast cancer in pre- and postmenopausal women in minimally-adjusted models

<table>
<thead>
<tr>
<th>Depression diagnosis</th>
<th>Anxiety diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>N cohorts</td>
<td>Events (PY)</td>
</tr>
<tr>
<td>Premenopausal women</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Postmenopausal women</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

No conflict of interest.
Results: 719 patients underwent SE. 254 were excluded for having multiple diagnoses on CNB leaving 465 total (86 ADH, 49 FEA, 182 IDP, 136 RS). Mean age was 55.3 years, median 54.2.

Overall RR was 9.2% (43/465). There was no difference in race/ethnicity (p = 0.27), BMI (p = 0.87), symptomatic vs. screen detection (p = 0.9), or breast density (p = 0.71).

Patients who upstaged were older (mean 59.5 vs. 54.9 years, p = 0.01), had prior history of breast cancer (14.3% vs 5.2%, p < 0.001), experienced delay between surgical consultation and SE (mean days 104 vs 47, p = <0.001), and had more peripherally located (mean distance from nipple 73.6 vs 63.2 mm, p = 0.03) or larger lesions (14.1 vs 10.2 mm, p = 0.01).

Factors associated with increased RR for individual lesions included: association with a palpable mass (20.8 vs. 5.5%, p = 0.02) and family history of breast/ovarian cancer (33.3% vs 12.2%, p = 0.02) for ADH, mammographic size for FEA (32 vs. 10.5 mm, p < 0.001), increased age for IDP (mean 65 vs 55, p = 0.001), decreased age for RS (mean 39.2 vs 55.1 years, p = 0.04), and personal history of breast cancer for FEA (25 vs 0%, p = <0.001) and IDP (33.3 vs 3%, p = <0.001).

Conclusion: Enhanced understanding of factors associated with upstage allows for personalized decision making.

No conflict of interest.

287 (PB-111)  Poster
Predicting factors of local recurrence in ductal carcinoma in situ of the breast
C. Pumarola Brussosa 1, H. Castillo 3, C. Mula 3, I. Cebrecos 3, X. Caparros 3, G. Oses 1, I. Torral 1, E. Mension 1 1 H. Clinic Barcelona, Breast Unit, Barcelona, Spain; 2 H. Clinic Barcelona, Radiation Oncology Department, Barcelona, Spain

Background: Ductal carcinoma in situ of the breast (DCIS) accounts for approximately 20% of breast cancer cases nowadays [UpToDate, Barrio], affecting therefore thousands of women worldwide.

The prognosis of DCIS after surgical treatment is excellent, with a mortality rate <5% in 15 years [Barrio] and a cancer specific survival exceeding 98% after 10 years [Gonen].

Various risk factors of recurrence have been described so far, which vary among series: young age at diagnosis, high nuclear grade, the size of DCIS [Sunil], positive surgical margins, family history of breast cancer, increased breast density, obesity and nulliparity or late age at first birth [Gonen]. The presence of comedonecrosis has been associated with earlier recurrences and micropapillary pattern with extensive disease volume [Sunil]. Finally, the risk of death is lower in tumours with positive oestrogen receptors.

Therefore, it is important to identify patients with higher risk of recurrence in order to selectively offer an adjuvant treatment that improves the prognosis of the disease. The aim of this study is to evaluate possible predictive factors of local recurrence of DCIS.

Material and methods: This is a longitudinal, retrospective study of women with DCIS treated in Hospital Clinic of Barcelona. Data from patients diagnosed with DCIS from 1990 until 2021 has been gathered in order to assess variables potentially associated to local recurrence of the disease. Patients diagnosed with DCIS and invasive breast cancer have been excluded.

Results: Data from 302 patients was analysed, with an average age of 57 years old and an average follow-up time of 10 years. 77.2% of patients underwent a breast conserving surgery and 22.8% a mastectomy. The margins of resection were affected in 9.3% of cases, and in 38.7% of the cases were <2 mm. Comedonecrosis was present in 60.9% of tumours. As for hormone receptors, almost 50% expressed oestrogen receptors and one third had positive progesterone receptors.

The prevalence of local recurrence (LR) has been assessed according to different clinical and histopathological features. In our analysis, the prevalence of LR did not significantly differ according to the age, the tumour size, the surgical margins, the presence of comedonecrosis, or the treatment with RT. On the other hand, it was significantly higher in tumours with a high nuclear grade (100% of LR were GIll-III tumours vs 88.43% without LR; p = 0.043) and in tumours with negative expression of hormonal receptors (38.46% of LR had negative hormonal receptors vs 19.01% without LR; p = 0.024).

Conclusion: In this retrospective study, both the recurrence rate and the proportion of invasive recurrences are similar to those described in the literature. A higher prevalence of LR of DCIS has been seen in high-grade tumours and in those tumours with negative hormone receptors, as evidence also shows.

No conflict of interest.
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