Results: 100 consecutive breast cancer cases were retrospectively analysed using the APIS assay. The APIS assay produces results in a binary manner, including an overall molecular subtype (See table 1). Proliferation assays are given either as measure of Ki-67 mRNA (MK67) or as a combined result of a panel of 4 proliferation markers (MKI67, PCNA, CCNA2, KIF23). Overall, there was 97% concordance between IHC and APIS. ERBB2 results were 100% concordant with IHC/ISH. There were 3 discordances in ER/PR status as summarised below;
1) IHC ER / PR positive and HER-2 negative vs APIS triple negative
2) IHC ER positive vs APIS ESR1 negative
3) IHC ER positive vs ESR1 negative
Ki-67 was discordant in 3 of 100 cases when compared with MK167 alone but discordant in 24/100 when compared with the four biomarker panel.

Conclusion: APIS mRNA biomarker assay shows high correlation with standard histopathology and has potential for routine use. Discordances in ER/PR status and proliferation markers require further validation studies.

Table 1
Example APIS Breast cancer subtyping Kit Analysis Report

Biomarker	Result
ESR 1	Negative
PGR	Negative
MK167	High
Proliferation	High
Subtype	Triple negative

P125
FAMILY HISTORY RISK ASSESSMENT IN TWO-WEEK-WAIT BREAST CLINICS – AN AUDIT OF THE SERVICE AT UNIVERSITY HOSPITALS OF DERBY AND BURTON (UHDB)

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Introduction: At UHDB we run a community breast pain clinic for patients presenting with breast pain only in which 11% of patients are found to be at above population risk of breast cancer and a further 20% have ≥1 family member affected but are at near population risk. We aimed to audit family history (FH) risk assessment in patients presenting to 2WW breast clinics with symptoms other than breast pain only.
Methods: All new patients attending 2WW clinics at UHDB between 02/05/2023 and 16/06/2023 were captured. Patients' clinic proformas were reviewed and their FH extracted. The Family History Risk Assessment Software (FaHRAS) was used to determine level of risk and response required, in line with NICE guideline CG164.
Results: 1171 patients were seen, average age 48.5 years (range 23-81). 6% were male. 855 (73%) had FH data collected adequately to allow risk assessment, and 60 (7%) of these were at moderate or high risk. 154 (18%) were found to be at near population risk but had ≥1 family member with breast cancer. 4/60 (0.7%) patients at increased risk were already known to the FH team and 20/60 (33.3%) were correctly referred to the FH team. However, 36/60 (60%) did not receive a referral where this was indicated.
Conclusions: Further improvement can be made both in i) risk assessment for ~25% patients and ii) appropriate onward referral where required. The next steps will be to provide further guidance to our staff and to consider sending out a FH questionnaire prior to clinic attendance.

P126
SIRIUS PINTUITION™ LOCALISATION DEVICE FOR IMPALPABLE BREAST LESIONS – THE UHDB EXPERIENCE

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Background: Sirius Pintuition™ is a localisation device, using a magnetic seed that can be detected up to 50mm. Prior to Pintuition™ we routinely used wire or needle-marker localisation.
Methods: All patients who had Pintuition™ at UHBD between July 2021 to present were included as part of the international IBRAnet study. The central database REDCap was used for data collection.
Results: A total of 170 cases have been recorded, 122 with complete data. Average age was 60 years (range 34 – 85); BMI 29 (range 17 – 52) and 20% received neoadjuvant therapy. Indication for surgery was invasive cancer in 76% of cases, DCIS in 12%, mixed in 7% and other in 4%.
Average pathological size was 17mm (range 0– 2mm) and weight of specimen 49g (range 4–683g). Bracketing using two Pintuition™ seeds was used in six cases. In 64 cases (52%), the surgeon took a shave, however Pintuition™ was only present in a shave in four cases (3%), the rest being in the main specimen. Based on histology, 24 cases (20%) needed further surgery to clear margins. No direct complications occurred due to Pintuition™, however; four cases (3%) required placement of another device on the day of surgery as Pintuition™ could not be adequately localised pre-operatively. In six cases (5%) Pintuition™ was not detected intra-operatively, but were still able to proceed based on pre-operative markings.
Conclusions: This early data on use of Pintuition™ has shown satisfactory outcomes in line with other localisation methods. Data on patient reported outcomes is needed.

P127
DEVELOPMENT OF AN AI PREDICTION MODEL FOR ARM LYMPHOEDEMA FOLLOWING BREAST CANCER SURGERY AND RADIOTHERAPY

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Background: PRE-ACT (Prediction of Radiotherapy side-Effects using explainable AI for patient Communication and Treatment modification) is an ongoing multi-disciplinary European study with the goal of using AI to predict long-term treatment side effects (toxicity) in breast cancer patients. AI and machine learning are already used in different areas of clinical practice. The aim of PRE-ACT is to leverage its huge potential towards accurate toxicity prediction to support shared treatment decision-making.
Methods: Discretized interpretable multi-layer perceptron neural network, random forest and gradient boosted tree models were developed to predict arm lymphoedema up to three years following surgery and radiotherapy +/- chemotherapy in three European multi-centre breast cancer cohorts (REQUITE, Hypo-G, CANTO, total n=6,361). Using patient- and treatment-related features (m=32), models were trained with 10-fold cross-validation in a 90:10 random-split dataset.
Results: Across three datasets, 40.4% had axillary lymph node dissection. The incidence of arm lymphoedema was 6%. Our best-performing model was based on gradient-boosted decision trees retaining all 32 patient- and treatment-related features with an AUC of 0.84 (±0.003). Sensitivity and specificity were 81.6% and 72.9%, respectively. Propositional rules were extracted from the models in order to explain their output.
Conclusion: We generated explainable predictions for arm lymphoedema

by applying machine learning algorithms to patient and treatment features. Inclusion of genomic and radiomic markers is likely to improve accuracy. The AI models will be incorporated into a web interface to identify patients at increased of risk of toxicity who may benefit from supportive intervention or even a change in treatment plan.

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CHANGING PRACTICE IN THE ASSESSMENT OF DISTANT METASTATIC DISEASE IN BREAST CANCER: THE DEVELOPMENT OF A STAGING PROTOCOL

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Introduction: Accurate staging for distant metastatic disease is critical when planning treatment for breast cancer and establishing prognosis. Previous evidence demonstrates that metastatic disease at presentation occurs in only 4-6% of patients. Although Royal College of Radiologists (RCR) guidelines provide clear thresholds for recommending staging investigations, variations in practice persist.
Methods: Concordance with RCR staging guidelines for distant metastatic disease was assessed at a UK teaching hospital. After formal audit registration, two months of multidisciplinary team (MDT) meetings were screened for patients. Following first cycle results, a staging protocol was developed. MDT meetings were screened for a further two months, and practices re-audited. A 'Breast Protocol' radiological request was introduced to ensure incorporation of the supraclavicular fossae (SCF) and proximal femora (PF) for Computed Tomography of Chest Abdomen and Pelvis (CT CAP).
Results: Following protocol introduction, 30 out of 109 patients (27.5%) had been staged, previously 54.4%. Of those staged, there was a 67.5% reduction in bone scans performed to 0%. 22/30 (73.3%) of patient staged met protocol criteria. Of the remainder 4/8 (50%), staging was supported by the MDT. 7/28 (25%) CT CAP staging requests specified 'Breast Protocol.'
Conclusions: The introduction of a staging protocol resulted in a substantial reduction in staging scans, standardisation of staging practices, and incorporation of the SCF and PF in CT CAPs. Such a change has reduced unnecessary radiological investigation as well as radiation exposure for patients, with a knock-on decrease in unit costs and radiology time for both performance and reporting of scans.

P130

PREDICTING AXILLARY RESPONSE TO NEOADJUVANT CHEMOTHERAPY IN LYMPH NODE-POSITIVE BREAST CANCER PATIENTS: IMPLICATIONS FOR TREATMENT DE-ESCALATION

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Objective: Our study, performed in a large UK Tertiary Breast Unit, aimed to determine the axillary response rate and accuracy of imaging in Lymph Node (LN)-positive patients treated with neoadjuvant chemotherapy (NACT) and Axillary Node Clearance (ANC), to identify subgroups who may be suitable for de-escalation of axillary intervention post-NACT.
Methods: Retrospective analysis of 140 patients with LN-positive breast cancer undergoing NACT and ANC from 01/01/2014 - 01/01/2020, with comparison between subtypes: ER+ve/HER2-ve; ER+ve/HER2+ve; ER-ve/HER2-ve; and ER-ve/HER2+ve. We evaluated axillary pathological responses (complete (pCR), partial (pPR), stable, or progression), and the predictive accuracy of imaging (MRI or ultrasound) by comparing to histology.
Results: Overall pCR rate was 46.4%. ER+ve/HER2+ve and ER-ve/HER2+ve exhibited higher pCR rates (67.86% & 77%), compared to ER-ve/HER2-ve (51.7%) and ER+ve/HER2-ve (8.3%). Evaluation of concordance between imaging and histology was performed for 100 (71%) patients with post-NACT imaging available. Concordance was limited (56%). Rates were similar by subtype. 30% of patients had imaging reporting a better response than histology. ER+ve/HER2-ve patients were more likely to have over-optimistic imaging (51%). 13.5 nodes were removed, on average (3–32). The mean number of positive LN was 2 (0–24). 35% had 1-3 positive LN and 18.6% had >3 positive LN. More ER+ve/HER2-ve patients had >3 positive LN (35.4%), compared to fewer ER+ve/HER2+ve (3.6%) and ER-ve/HER2+ve (8.6%) patients.
Conclusions: Receptor subtypes impact axillary response to NACT. Imaging reliability in predicting axillary response is limited, particularly in ER+ve/HER2-ve patients, who show low pCR rates and higher LN disease burden, cautioning against axillary treatment de-escalation. UHL-Audit-number-11195.

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IMAGING RESPONSES IN DIFFERENT BIOLOGY DURING NEOADJUVANT CHEMOTHERAPY IN EARLY BREAST CANCER AND CORRELATION WITH ONCOPLASTIC SURGERY PLANNING

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Introduction: The shift towards avoiding mastectomy post-neoadjuvant chemotherapy (NACT) necessitates robust preoperative imaging with high sensitivity and specificity. It can also be useful in planning complex oncoplastic conservations. This study presents the utility of imaging (MRI) during NACT in achieving the objectives of avoiding mastectomy by assessing tumour response and how that influences surgical outcome.
Methods: A retrospective study audited responses to NACT in 420 primary breast cancer patients. A baseline pre-NACT imaging (USS/MRI) was followed by mid-NACT imaging (to assess response) and an end-of-NACT imaging helped ascertain the feasibility of breast conservation with/without oncoplastic surgery. Clinical and imaging data were correlated with post-operative pathology to evaluate imaging accuracy in predicting pathological responses.
Results: Of 380 patients with pre-NACT breast MRI, sensitivity and specificity were 50% (71/142) and 88% (205/234), respectively and positive predictive value (PPV), 71%. Of the 29 with complete MRI response but partial pathological response, 4 had positive margins post-surgery, 2 were converted to mastectomy, and one had a clear re-excision. Of the 71 patients who were incorrectly identified as non-complete responders on MRI but complete pathological responders, 28 had mastectomies.
Conclusions: MRI shows high PPV in the assessment of NACT response, however, there are logistical limitations as well as the need for more accuracy since there are likely tumour elements like calcifications that will need to be combined with mammograms to enhance breast conservation surgery planning especially oncoplastic surgery. Finally, any gene mutation or patient choice influences the incidence of mastectomy following NACT regardless of response.

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THE EFFICACY OF ANTISEPTIC TREATMENT OF SURGICAL DRAINS ON BACTERIAL COLONISATION AND SURGICAL SITE INFECTION POST BREAST SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims: Surgical site infection (SSI) is a common complication in women with post-operative drains following breast surgery, with the risk being as high as 19%. The authors aimed to conduct the first meta-analysis to determine the efficacy of antiseptic treatment of drains to reduce the incidence of infections by comparing it to drains with no antiseptic coating.
Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed with an extensive search of the electronic databases retrieving 114 articles. Four articles met the inclusion criteria. The primary outcome measure was the incidence of SSIs and secondary outcome measures included the incidence of bacterial