oncology, clinical oncology and obstetric management) over the last 5-year period.

Results: Three units have completed data collection ($n = 10$ PABCs diagnosed during pregnancy). The mean gestational age at diagnosis was 20.9 weeks. Most (60%) underwent surgical resection (40% mastectomies, 10% BCS) during pregnancy. Eighty per cent of the patients received anthracycline-based chemotherapy during pregnancy; of those 30% received chemotherapy in the neoadjuvant setting. Seventy per cent of patients also received taxanes. Toxicities seen were similar to those in non-pregnant patients. All chemotherapy was administered after the second trimester. All ER-positive cancer patients were given adjuvant tamoxifen. None of the patients breastfed postpartum. For early stage PABCs, 25% of patients received adjuvant radiotherapy during pregnancy, with the remainder receiving radiotherapy after delivery.

Conclusion: Our preliminary data confirm the multidisciplinary nature of our Breast Cancer Trainees Research Collaborative Group. We continue to work with our collaborative group to complete data collection. The authors would like to encourage other institutions across the UK to join the workforce.

Managing Osteonecrosis of the Jaw Related to Denosumab in Patients with Breast Cancer

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Purpose: Bone metastases in breast cancer are associated with a median reduction in survival of 2 years and significant morbidity and impairment of quality of life. Denosumab is used for the prevention of skeletal-related events such as pathological fractures and spinal cord compression. Adverse events include osteonecrosis of the jaw (ONJ). We reviewed adverse events associated with denosumab use at a single centre.

Methods: Breast cancer patients treated with denosumab between January 2016 and December 2017 were identified retrospectively using an electronic chemotherapy prescribing system (Chemocare). Patient records were reviewed for adverse events and patient morbidity associated with denosumab.

Results: In total, 112 patients were treated with denosumab. Of these, 12 patients (10.7%) experienced adverse events that resulted in stopping treatment. Toxicities included deteriorating dental health or poor wound healing following dental surgery, diarrhoea, poor renal function and hyper/hypocalcaemia. Specifically, four patients (3.6%) stopped treatment due to symptoms associated with ONJ. They were all referred to maxillofacial services and restorative dentistry as required.

Conclusion: Medication-related osteonecrosis of the jaw (MRONJ) is associated with significant morbidity. The real-life incidence of MRONJ is probably underestimated. Currently, no national guidelines are available specifically for managing MRONJ in cancer patients. We have developed local guidelines that aim to develop a multidisciplinary approach with key areas to optimise management of patients, e.g. primary care, oral and maxillofacial services, speech and language therapy, pain specialists, dieticians and psychoncology support. We aim to audit our practice before and after the implementation of guidelines.

A Retrospective Audit on Outcomes Following Implementation of Neoadjuvant Treatment of HER2-positive Breast Cancer with Combined Pertuzumab and Trastuzumab with Docetaxel

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Purpose: A phase II trial, NeoSphere (2012), reviewed the effect of pertuzuamb in combination with trastuzumab for the treatment of early HER2-positive breast cancer with docetaxel in the neoadjuvant setting. Data identified, although not statistically significant, a greater 5 year progression-free interval with this combination. Patients had significantly better complete pathological response rates (cPR), probably associated with longer progression-free survival (45.8%) [1,2]. To audit local data on patients receiving neoadjuvant pertuzumab, trastuzumab and docetaxel and review cPR and tolerability of the regimen.

Methods: Data of patients with HER2-positive breast cancer treated with neoadjuvant anti-HER2-based chemotherapy between 2016 and 2017 were retrieved. Data reviewed included demographics, histological subtype, treatment given, tolerability and outcome from treatment including a pathological response.

Results: In total, 42 patients received treatment during this period. 22/42 (52%) patients had cPR to treatment, with 6/42 of these patients having cancer *in situ* (CIS) remaining. Nineteen patients obtained a partial response and one patient had no response to treatment. 29/42 completed the total of eight cycles of chemotherapy, with 19/42 requiring dose reductions and 7/42 developing a grade 3 toxicity, although poorly documented. 2/42 had chemotherapy stopped following disease progression.

Conclusion: Our results correlate with NeoSphere data with similar response rates, with both including CIS remaining as part of cPR outcome. Some patients with multifocal breast cancers with varying HER2 positivity had a partial response to treatment. These results could alter the data, as it was difficult to identify HER2 status on remaining disease. Therefore, a complete response to treatment with only HER2-negative disease remaining would be categorised as a partial response. We can confidently say this regimen is generally well tolerated, but documentation of toxicity needs improving. We await the outcome of ongoing trials focusing on disease-free survival as the primary outcome in this subset of patients.

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Outcomes of Neoadjuvant Chemotherapy in Breast Cancer Subtypes Guide Rationalising its Use in High-risk Patients by Tumour Genomic Profile

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Purpose: Neoadjuvant chemotherapy downstages breast cancer, permitting less extensive surgery and facilitates early initiation of systemic therapy in high-risk patients. Approximate overall response rates are 69% [1] and pathological complete response (pCR) rates are 24% [2]. We compared outcomes of patients from two North London hospitals with the published data and assessed the risk of progression during therapy.

Methods: We retrospectively reviewed all the patients from two hospitals who received neoadjuvant chemotherapy for breast cancer from October 2016 to 2017.

Results: We identified 58 female patients aged 25–87 years (mean 52 years). Thirty-eight per cent were T3–4 by magnetic resonance imaging (MRI), 75% were node-positive by ultrasound or sentinel node biopsy (SNB) and 39% were grade 3. Multiple regimens including EC-T, FEC-T/T-FEC, FEC-TH, FEC-TPH and wTaxol-H were used, with EC-T being the most common. Fifty-four per cent underwent mastectomy; 54% underwent axillary node clearance (ANC). The overall pCR rate was 33.3%, but was 36% in 'triple-negative' patients, 12% in oestrogen receptor-positive (ER+)/human epidermal growth factor receptor 2 negative (HER2−) patients and 66% in ER−/HER2+ patients. Sixty-four per cent had a >20% reduction in tumour size; 61% had an axillary pCR. Eight patients had possible disease progression, seven of whom were ER+ or grade 1–2. In two there was radiological progression during treatment and both recurred with metastatic disease within 6 months.

Conclusion: In our cohort of patients, pCR rates were comparable with the published data and progression was rare. ER+/HER2− patients had the lowest pCR rate and were at highest risk of disease progression during chemotherapy, whereas 'triple-negative' and HER2+ patients had the

highest pCR rates. Our data suggest that neoadjuvant chemotherapy is best utilised in 'triple-negative' or HER2+ patients and upfront surgery followed by genomic testing may be more appropriate in ER+ patients.

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Endocrine Therapy in Breast Cancer: a Snapshot of Current Practice

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Purpose: Recent data have demonstrated improved disease-free survival with ovarian function suppression (OFS) + aromatase inhibitors in high-risk premenopausal women under 35 years with hormone receptor-positive early breast cancer [1]. We aimed to establish whether there is any consensus on selecting patients for this treatment among UK breast oncologists.

Method: An electronic survey of six questions was distributed to breast oncology consultants in the UK.

Results: Seventy-three consultants responded to the survey. Thirty-nine (55%) reported using OFS in all high-risk patients. Forty-five (60%) are routinely offering OFS to patients aged under 35 years. A further eight (11%) used a cut-off of 40 years. Eleven (15%) respondents would offer OFS to any woman remaining premenopausal irrespective of age. Forty-five (60%) used the administration of chemotherapy to define high-risk disease. Twenty-one (28%) used a percentage chance of relapse and 5% used the patient's age or lymph node status. When initiating OFS, the majority (34%) choose to start OFS concurrently with aromatase inhibitors. The remaining respondents were equally split between starting concurrently with tamoxifen, starting tamoxifen first or switching to aromatase inhibitors if well tolerated. Deciding between tamoxifen or aromatase inhibitors was predominantly influenced by expected tolerance (38% of respondents), side-effects (14%), risk factors (14%), patient preference (11%), age (9%) and available data (9%). Adjuvant bisphosphonates were standardly offered by 62% of respondents to those patients being treated with OFS.

Conclusion: There is a lack of consensus regarding the initiation and use of endocrine therapy and OFS. Although patient factors will continue to influence practice, we suggest that it would be helpful to develop a UK-wide guideline incorporating the latest data. Further work to identify factors that promote tolerance to challenging treatment regimens alongside studies looking at the long-term adherence to ovarian suppression would be useful in guiding initial treatment options.

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Identifying and Monitoring Steroid-induced Hyperglycaemia in Breast Cancer Patients Receiving Steroids as Part of their Systemic Anticancer Therapy

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Purpose: Steroid-induced hyperglycaemia is a common adverse effect in patients with either known diabetes or without a previous history of diabetes. Many chemotherapeutic regimens include corticosteroids to prevent chemotherapy-induced nausea and vomiting or to prevent allergic reactions. The purpose of this audit was to determine whether steroid-induced hyperglycaemia in breast cancer patients is being identified correctly and monitored appropriately.

Methods: Breast cancer patients attending the chemotherapy unit over a period of 1 month were included. The local outpatient pathway for identifying and monitoring steroids and hyperglycaemia was used as a reference tool. HbA1c at the start of treatment and random blood glucose measurements throughout treatment were audited. Following the initial audit, the local pathway was refined and a training session was provided by a diabetic specialist nurse. The audit was repeated 6 months after the initial audit.

Results: Data were collected for 95 patients during the audit and re-audit period. During the initial audit, a baseline HbA1c was performed on 11/41 (26.8%) patients and random glucose monitoring was performed on 41/41 (100%) patients. A raised HbA1c was identified in three patients, two of whom were not previously known to have diabetes. At the time of re-audit, 5/16 (31.3%) patients on steroids had a baseline HbA1c performed and 52/54 (96.3%) patients had random glucose monitoring.

Conclusion: Random glucose monitoring was consistently performed but baseline HbA1c was not performed adequately. Our audit highlighted that HbA1c monitoring during steroid treatment is important, as patients were identified with newly impaired glucose control and diabetes. The low rate of HbA1c monitoring could be due to insufficient knowledge of the local steroid-induced hyperglycaemia guideline in the oncology outpatient setting. We plan to improve education in this area and then repeat the audit in 6 months.

Impact of Routine Use of CDK4/6 Inhibitor Therapy on Breast Cancer Outpatient Clinic Workload and Patient Experience

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Purpose: The cyclin-dependent kinase 4 and 6 (CDK4/6) inhibitors are important new agents in the care of patients with hormone receptor-positive (HR+) and HER2-negative (HER2−) advanced breast cancer. CDK4/6 inhibitors are generally well tolerated, although neutropenia is a significant class-wide adverse effect. Frequent monitoring of the full blood count (FBC) is required during treatment so that neutropenia is managed with appropriate dose interruption and/or dose reduction. We sought to assess the impact of repeated visits to the oncology outpatient clinic as well as waiting time for FBC results.

Methods: This was a retrospective observational study of data from an electronic medical record database. Female patients receiving palbociclib or ribociclib from 14 June 2017 to 31 August 2018 were included.

Results: In total, 45 patients were treated with the combination of endocrine therapy plus a CDK4/6 inhibitor during the study period. Overall there was a total of 565 outpatient visits for these patients (median 11 per patient, range 2–28). Patients required FBC monitoring at all OPAs (outpatient appointments) and we calculated median waiting times for FBC results as 81 min (range 11–415 min). In total, 18/45 (40%) patients required at least one dose reduction. A permanent discontinuation of treatment occurred in 7/45 (15.6%) patients and the longest duration of treatment was 16 cycles (ongoing response).

Conclusion: CDK4/6 inhibitors have demonstrated meaningful improvement in progression-free survival in clinical trials [1–3]. However, integration of these agents into routine clinical care comes with challenges. These results demonstrate a significant increase in the outpatient workload and significant waiting times for blood results, which adversely impact quality of life for patients. Strategies to reduce the waiting times for FBC results and repeated oncology outpatient appointments include using point-of-care FBC testing, homecare services for monitoring and pharmacy or nurse-led clinics. We welcome discussion of how these demands are being met nationally via the UKBCG.

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