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Abstract 1
Type: Oral & Poster
Category: Audit

Why is there no compassion for compassionate usage of medication in colorectal cancer care?

Joanne Collins, Dr Taha Lodhi, Nina Paton, Raj Khera, Mohammed Alani and Mark Saunders

Background: Metastatic colorectal cancer is one of the commonest causes of cancer and cancer-related deaths.[1] The prognosis remains poor and successive treatment options remain limited.[2] Many patients will run out of treatment options before they become medically unfit for therapy.[3] Cancer drug innovation presents both opportunities and dilemmas as access to innovative cancer medications can be limited by a significant delay between clinical trials, licensing, and positive drug guidance.[4,5] Consequently, where no commissioned alternative medicine exists some pharmaceutical companies operate compassionate usage access schemes (Figure 1). These allow cancer treatment with investigational, unlicensed, or off-label medicines as soon as early evidence of potential benefit emerges.[6] There is a paucity of information regarding compassionate schemes. This analysis was performed to ascertain real-world data on patients enrolled in these schemes.

Methods: Single-centre study conducted at The Christie Hospital, Manchester, UK. We reviewed the process of pharmacy drug set-up and maintenance by undertaking a survey of disease group pharmacists. We undertook a retrospective audit using an electronic patient record of patients who entered into a compassionate scheme between 2018 and 2020. This analysis focused on 27 patients with a diagnosis of metastatic colorectal cancer receiving compassionate medication who possessed the BRAF mutation (mBRAF V600E) or MSI-H status. We analysed 17 mBRAF patients treated with a triplet combination (encorafenib, binimetinib and cetuximab), and subsequently, doublet (encorafenib and cetuximab), as defined by the BEACON study, and 10 MSI-high patients on compassionate nivolumab.[7,8]

Results: Our survey of compassionate medication across 14 disease groups demonstrated the approval process is lengthy and resource intensive. The average approval time was variable, but pharmacy set-up time could take several days depending on the drug or regimen. However, this is countered by our analysis of 27 metastatic colorectal cancer patients. Most patients were fit (> 88% PS $\leq$ 1, 50% had no known co-morbidities) and for 62% this represented third- line therapy, in a cancer setting with limited or no treatment options. Patients received 10 cycles of treatment on average before progression or unsuitability, with a mean duration on the treatment of 120 days (15–317) on the triplet/doublet combination and 205 days on nivolumab (range: 1–663), demonstrating benefit. Patient demand was uninhibited by geographical distance (> 30% of patients lived 20+ miles away from the treatment centre) and the possibility of hope and life extension with further treatment.

Conclusion: Our audit demonstrates that patients received compassionate drugs that were subsequently commissioned by NHSE, with some benefiting from treatment for a considerable period. This suggests there was both a moral gain and a survival advantage over best supportive care; however, there remains limited real-world data and further research is required. Access to compassionate schemes is controversial and limited as they can be seen to promote healthcare inequity, creating a post-code lottery, as they may not be available in some regions, circumvent existing guidelines or benefit pharmaceutical companies by allowing early data and market access. Compassionate usage recognises a human side to drug development which requires a moral balance between patients.

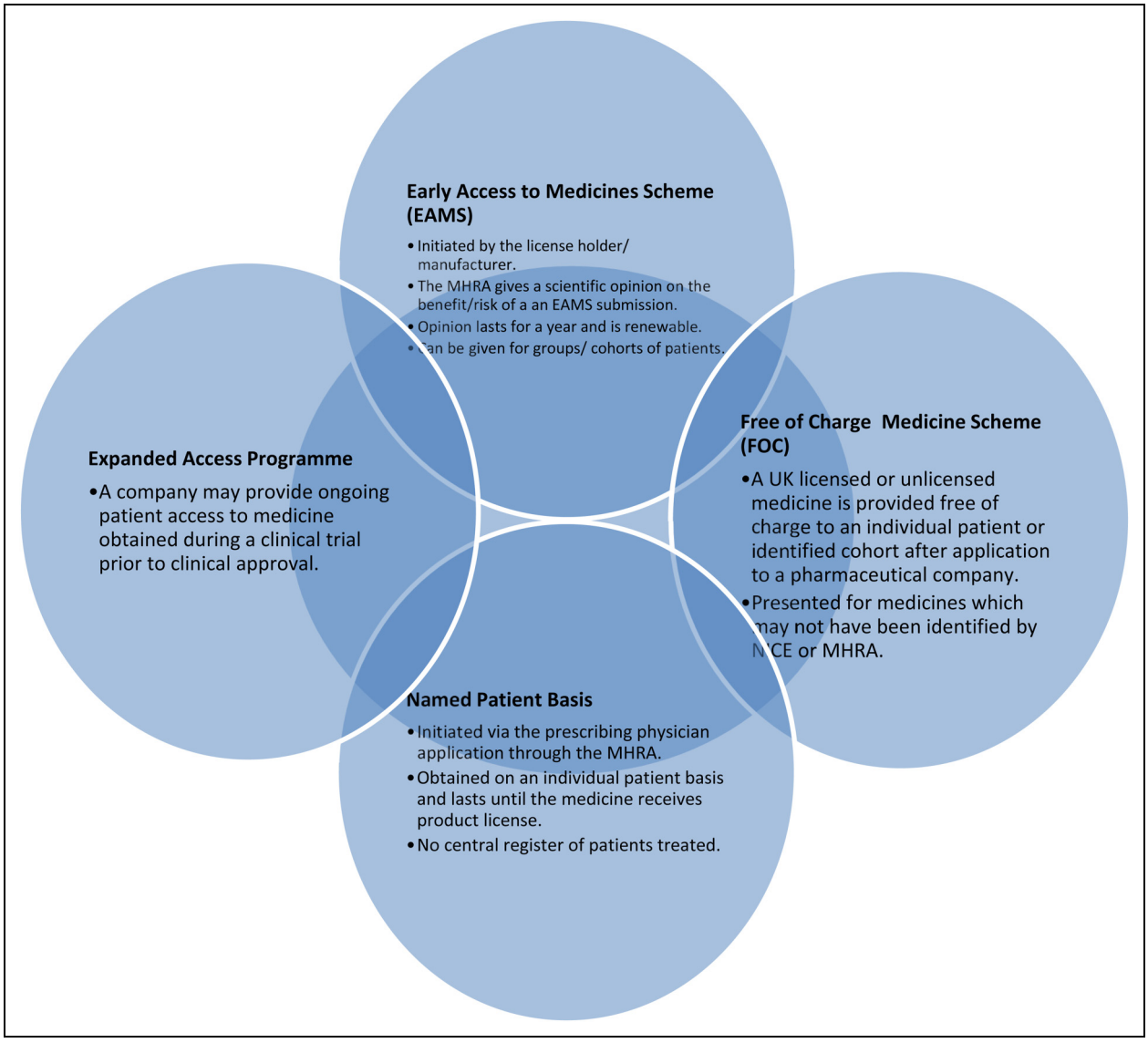

Figure 1. A summary of the different compassionate usage schemes available in the UK.

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Abstract 2
Type: Oral & Poster
Category: Audit

Biosimilar filgrastim for healthy donor peripheral blood stem cell mobilisation

Raakhee Shah, Fiona Clark and Mariam Aziz

Introduction: Due to limited experience with biosimilar filgrastim, healthy donors were not recommended to receive biosimilar products. Following the increased experience, in 2019 the World Marrow Donor Association recommended biosimilar filgrastim for peripheral blood stem cell mobilisation in healthy donors[1] and Anthony Nolan recommend biosimilar filgrastim in unrelated donors. At our centre from 19/08/2021, all healthy related donors received biosimilar filgrastim (Zarzio) for peripheral blood stem cell mobilisation instead of Lenograstim.

At our centre, granulocyte-colony stimulating factor (G-CSF) 10 mg/kg/day is the preferred peripheral blood stem cell mobilisation regimen in healthy donors. Target yields of 5–6×10^6 CD34 cells/recipient weight are aimed for, with a minimum requirement of 2×10^6 CD34 cells/recipient weight, to proceed to transplantation. Higher yields are preferred for cryopreserved cells due to loss during freezing and thawing.

Objectives: To retrospectively compare adult-related peripheral blood stem cell donor mobilisation with lenograstim or biosimilar filgrastim (Zarzio) for outcomes, adverse events and cost over a 24-month period.

Aims

1. To achieve a minimum of 2×10^6 CD34 cells per recipient weight per donor harvest.
2. To compare the G-CSF-related adverse events between lenograstim and biosimilar filgrastim.
3. To compare the cost of mobilisation with lenograstim to biosimilar filgrastim.

Method: All adult-related donors over a 24-month period were identified, and the first 30 donors administered biosimilar filgrastim were compared to the last 30 donors administered lenograstim. Donors were identified using an in-house transplant database, and demographic data, G-CSF dose, CD34 cell dose collected and a number of days of the harvest were collected and analysed using Microsoft Excel. Medical records were reviewed for G-CSF-related adverse effects. The cost of 5 days of G-CSF was compared using BNF 84 prices.

Results: See Table 1.

Discussion: Both groups were similar in age, weight and G-CSF dose administered. During the COVID-19 pandemic, allogeneic donor cells were cryopreserved rather than infused fresh for scheduling and infection reasons. This is shown in our data as 67% of biosimilar filgrastim collections were cryopreserved compared to 40% with lenograstim.

Table 1 shows all donors achieved the minimum collection yield, however, a higher mean yield was achieved with biosimilar filgrastim compared to lenograstim although this was not

Table 1. Lenograstim and biosimilar filgrastim, Zarzio related donor peripheral blood stem cell mobilisation outcomes, adverse events and cost.

	Lenograstim (n = 30)	Filgrastim (Zarzio) (n=30)	p value
Donor age (years), mean (range)	43 (19–71)	37 (20–62)	0.25
Weight (kg), mean (range)	82.5 (58.1–121.6)	81.8 (57.5–109.4)	0.89
G-CSF dose (mcg), mean (range)	812 (631–1157)	822 (600–1080)	0.81
G-CSF dose per donor weight (mcg/kg), mean (range)	9.9 (9.0–10.9)	10.0 (9.1–11.3)	0.26
CD34 cell yield per recipient weight ($\times10^6$/kg), mean (range)	7.7 (2.4–20.8)	9.1 (2.7–26.1)	0.23
Harvest days, mean (range)	1.3 (1–2)	1.4 (1–2)	0.79
Cryopreserved cells, n (%)	12 (40%)	20 (67%)	–
G-CSF related adverse events, n (%)	2 (7%)	0	0.16
Total G-CSF cost inc. VAT (as per BNF July 2022)	£30012.60	£20574.25	–

statistically significant. This higher yield may be more favourable to the recipient if the cells are cryopreserved.

Two donors reported pain with lenograstim that was resolved with analgesia compared to no reported events with biosimilar filgrastim, demonstrating that biosimilar filgrastim was well tolerated in healthy donors.

An average of 1.3 harvest days was required to achieve a successful collection with biosimilar filgrastim, therefore, 5 days of G-CSF should be provided despite the risk of wastage. Biosimilar filgrastim resulted in a cost difference of approximately £9500 in 30 related donors.

Conclusions: In related adult peripheral blood stem cell donors, biosimilar filgrastim (Zarzio) achieves successful collection yields, minimal adverse events and is cost-beneficial. Further data is needed to compare efficacy and safety in paediatric donors.

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Abstract 3
Type: Poster
Category: Audit

Audit of treatment tolerability and patient outcomes in patients treated with abemaciclib in combination with fulvestrant under a free access scheme: 3-year follow-up

Suzanne Frank and Arfan Khan

Introduction: In December 2018, Lilly opened a Free Access Scheme for patients to access abemaciclib within its licensed indication in combination with fulvestrant for the treatment of hormone receptor-positive, HER2 negative locally advanced or metastatic breast cancer for patients who had received prior endocrine therapy. The primary objective of the audit was to analyse toxicity and tolerability including deferrals and dose modifications. A secondary objective was to assess patient outcomes.

Method: Retrospective review of electronic prescriptions and case notes of all patients enrolled in the programme with data analysis on 31 December 2021. All toxicity was recorded throughout the first three cycles of treatment. Beyond cycle 3 the reasons for dose modification were recorded. In clinical trials, abemaciclib and fulvestrant were associated with an increased incidence of venous thromboembolism (2%) therefore a specific keyword search for reports of venous thromboembolism was undertaken throughout the whole treatment period.

Results: Thirty-three patients commenced treatment in the programme.

Patient characteristics	*n* (%)
Female	33 (100)
Age, range, years	45–83
Breast cancer status, *n* (%)	
HR+ HER2–	33 (100)
Metastatic	31 (94)
Locally advanced	2 (6)
Bone only disease	8 (24)
Liver metastases	11 (33)
≥ 2 sites of metastatic disease	18 (55)
CNS metastases	2 (6)
Prior diagnosis EBC	26 (79)
Primary endocrine resistance	2 (6)
Previous treatment, *n* (%)	
Previous endocrine therapy for advanced BC	25 (76)
Previous SACT for advanced BC	14 (42)

Tolerability: The predominant toxicities reported were diarrhoea, fatigue and nausea. Grade 3 neutropenia was recorded on two occasions. There was no febrile neutropenia reported. No patient required any treatment intervention at the interim blood check on day 15 of cycle 1 or 2. VTE was reported in two patients. The rate of deferral was 6% in cycle 2 and 12% in cycle 3. A total of 15 dose modifications were made. One patient discontinued treatment due to toxicity. Five patients took a break from treatment due to the Covid-19 pandemic and three resumed treatment.

Outcomes: 6 (18%) patients remain on treatment. One patient switched to palbociclib and is still receiving treatment. 26 (79%) patients have progressed of whom 18 have subsequently passed away. 20 (77%) patients who progressed went on to receive further treatment with chemotherapy being the most common post-discontinuation therapy.

Discussion: This is a review of a small cohort of patients treated with abemaciclib in combination with fulvestrant within a free access scheme. Abemaciclib was well tolerated by our real-world patient population. There were low rates of deferrals and dose reductions. Only one patient discontinued due to toxicity. No interventions were made on the basis of blood at day 15 of cycles 1 and 2 which has led to a change in our monitoring protocol.

Six patients remain on treatment This patient cohort does not correlate with the inclusion criteria of the Monarch-2

trial as they were more intensively pre-treated with patients receiving prior SACT and more than one line of endocrine therapy in the advanced breast cancer setting is included in this cohort.

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Abstract 4
Type: Poster
Category: Audit

Pharmacogenomic testing for dihydropyrimidine dehydrogenase polymorphisms in patients receiving fluoropyrimidine therapies at Mount Vernon Cancer Centre

Mariam Azizi, Dr Vikash Dodhia, Hei Wan, Wendy Ng, Dr Neel Bhuva and Dr Ridwan Ahmed

Introduction: Fluoropyrimidines (5-fluorouracil and capecitabine) are used in the treatment of various cancers. The enzyme dihydropyrimidine dehydrogenase (DPD) plays a key role in their metabolism (Lunenburg 2020). Some patients have reduced DPD activity leading to an increased risk of severe/fatal toxicity (Amstutz et al., 2017). In March 2020, the EMA Pharmacovigilance Risk Assessment Committee recommended DPD deficiency testing prior to starting fluoropyrimidines (UK Chemotherapy Board, 2020). Testing for DPD was introduced at Mount Vernon in March 2021.

Aims and objectives: To review if DPD testing meets the standards set by the UKCB and as agreed with the consultant team. To ascertain if:

All patients starting fluoropyrimidines are being tested for DPD prior to treatment. All patients being tested for DPD have no delays in treatment.

Method: Data was collected retrospectively over 10 months from March 2021 to December 2021. Information from blood test reports, ChemoCare and patient notes were obtained.

Results: 348 patients were initiated on fluoropyrimidine-based therapy. Compliance with audit standards is summarised in table 1. 4.7% ($n = 15$) of patients did not have a DPD test, with reasons unknown. The turnaround time for DPD results varied each month but averaged at 10 days. For some patients, this caused a delay in starting treatment whereas others were delayed due to the DPD test not being ordered on time, chair capacity, and other reasons. Obtaining results from different pathology systems (i.e. Guy's and St Thomas', North West London, Watford General, and Royal Marsden) also led to delays.

Discussion: This analysis shows that > 95% of patients are being routinely tested for DPD however testing pathway delays are having an impact on patients starting treatment. Overall, 40% of the standards are being adhered to (standards 3 and 4); however, some standards have not been achieved (standards 1, 2 and 5).

Recommendation: Create a centralised portal system for which all DPD results are reported and accessible. Due to multiple laboratory sites where DPD testing is conducted, there is difficulty in chasing available results, consequently leading to delays in treatment. Having a central reporting system could also save costs as it prevents patients being re-tested. Interface DPD results into electronic prescribing systems to ensure no prescribing errors. Currently, the results are being manually typed by clinicians onto ChemoCare. Integrated reporting will ensure appropriate

Table 1. Summary of standards met.

Standards (UKCB)	Compliance (%)
Standard 1 – 100% of patients initiated on fluoropyrimidine treatment were tested for DPD when required.	95.3
Standard 2 – Turnaround time for DPD results was < 5 days for 100% of patients	24.2
Standard 3 –100% of patients who tested positive had a dose reduction/amendment to their treatment	100
Standards (agreement with consultant team)	**Compliance (%)**
Standard 4 – 100% of DPD results obtained	100
Standard 5 – 0% delay in patients starting treatment	52.9

patient flow and prevent human errors and delays in treatment. Further investigation on the impact DPD testing has had on reducing fluoropyrimidine toxicity. Present the results of this audit at doctor's educational meetings and to nursing and pharmacy staff (delivered by the educational lead pharmacist). A collaborative approach can help improve strategies for DPD testing. Re-audit by the end of 2022 to ensure that improvements are sustained after the above recommendations have been implemented.

Conclusion: DPD testing is a novel approach to preventing fluoropryimidine toxicity. This audit revealed that not all national standards are being adhered to; consequently leading to treatment delays. However, effective training and a centralised system should increase compliance with the standards set by the UKCB and as agreed with the consultant team.

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Abstract 5
Type: Poster
Category: Audit

An audit of medication-related problems in multiple myeloma patients

Hannah Miller, Jessica Thompson, Simon White, Roxy Spencer Emma Witham and Faye Sharpley

Introduction: Multiple myeloma (MM) is a plasma cell malignancy and accounts for 15% of haematological cancers.[1] Prevalence is highest in elderly patients, with the incidence rising due to the globally aging population.[2] Elderly people are more susceptible to frailty-related problems such as co-morbidities, polypharmacy and falls.[3] In addition to the non-MM related issues, the multi-medication treatment regimens for MM patients can amplify this problem, resulting in an increased incidence of medication-related problems (MRPs). In this study, MRPs were defined as any issue experienced by a patient that could be directly linked to medication. Based on this, it appears there is an unmet need to identify MRPs quickly and quantify their resolution to understand if they can be avoided altogether, minimising polypharmacy and its associated problems.

Aim: The aim of the study was to establish and characterise the proportion of MM patients with MRPs and identify how the MRPs were resolved.

Methods: All patients with MM on active treatment who attended a clinic between 07 March 2022 and 15 April 2022 were included in the study. The Trust's Patient Flow system was used to determine the clinic list and the iQemo electronic-prescribing systems were used to ascertain those on active treatment. MRP-related data were recorded during routine clinic assessment by the haematologist and discussed with the pharmacy team post-consultation to allow characterisation and resolution. Data relating to medicines including type and number, together with patient demographic data such as age were collected from medication reconciliation records, using verbal and written sources. The data were subjected to descriptive statistical analysis, which included grouping and frequency counting of MRP data. A favourable ethical opinion was obtained from the Keele University Faculty of Medicine and Health Sciences Research Ethics Committee.

Results: Thirty-three patients were included in the study, and 21 MRPs recorded. Fifteen patients (45%) experienced at least one MRP, and of these, seven (47%) experienced two or more. The mean age of patients was 76 years (range: 62–88 years) and the incidence of MRPs was highest in the 70–79 years age category. The most common MRPs included pain (n = 5/15%), insomnia (n = 3/9%) and fatigue (n = 3/9%), although other issues such as fluid retention (n = 2/6%), peripheral neuropathy (n = 2/6%), constipation (n = 2/6%), shakes (n = 1/3%), nausea (n = 1/3%), cramps (n = 1/3%) and infection (n = 1/3%) were also noted. From the 21 MRPs that arose 9 (44%) were actioned during the clinic review. Eight (37%) required additional monitoring, investigation, or referral, and 4 (19%) were not resolved, as shown in Figure 1.

Discussion: Almost half of MM patients on active treatment experienced MRPs, and these were most common

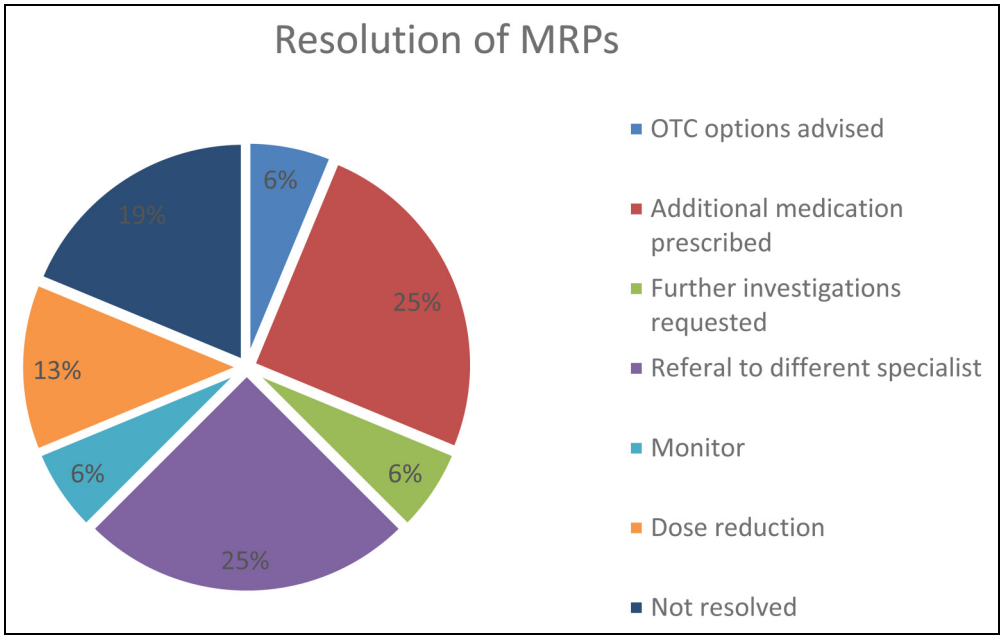

Figure 1. Breakdown of resolution of medication-related problems (MRPs).

in patients between 70 and 79 years. This supports previous study findings that MRPs are more prevalent in elderly patients on active treatment for MM.[3] Of the MRPs identified, less than half were actioned during routine clinic review. Limitations of this study included the small sample size; therefore, future work could include conducting a larger-scale study. Future work could explore how MRPs can be prevented or actioned earlier to minimise additional problems.

Abstract 6
Type: Poster
Category: Audit

Audit of non-medical prescribing activity at Oxford Cancer and Haematology Centre

Nicola Stoner, Hannah Chaudhry and Nilesh Patel

Background: Non-medical prescribers (NMPs) (nurses and pharmacists) work within the multidisciplinary teams at Oxford University Hospitals (OUH) Cancer & Haematology Centre, undertaking systemic anticancer treatment (SACT) toxicity review and symptom control clinics. Prescribing aligns with local protocols and competency.[1]

Objectives: The aim of this audit was to quantity NMP patient review numbers and workload, detail medicines prescribed, and record dose changes (including deprescribing).

Method: A sample of 70 patients was identified from electronic clinic lists for colorectal, renal and breast cancer. The data were collected retrospectively for a 6-month period (1 October 2020–31 March 2021) and identified the prescribing undertaken in the NMP clinics.

Patient information was collected by extracting data from electronic patient records and the SACT e-prescribing system (ARIA):

- Patient NHS number, age, sex, BMI
- Clinic date, diagnosis and medication.
- Prescribing information in letters and electronic prescriptions
- Medications and treatment changes (including the doses and details of each drug)
- Details of any referrals.

NMPs completed a questionnaire, questions included:

- Amount and types of clinics
- How long the practitioner had been an NMP
- Specialities in prescribing
- Number of patients seen and frequency of reviews
- Types of drugs prescribed
- Changes made and referrals.

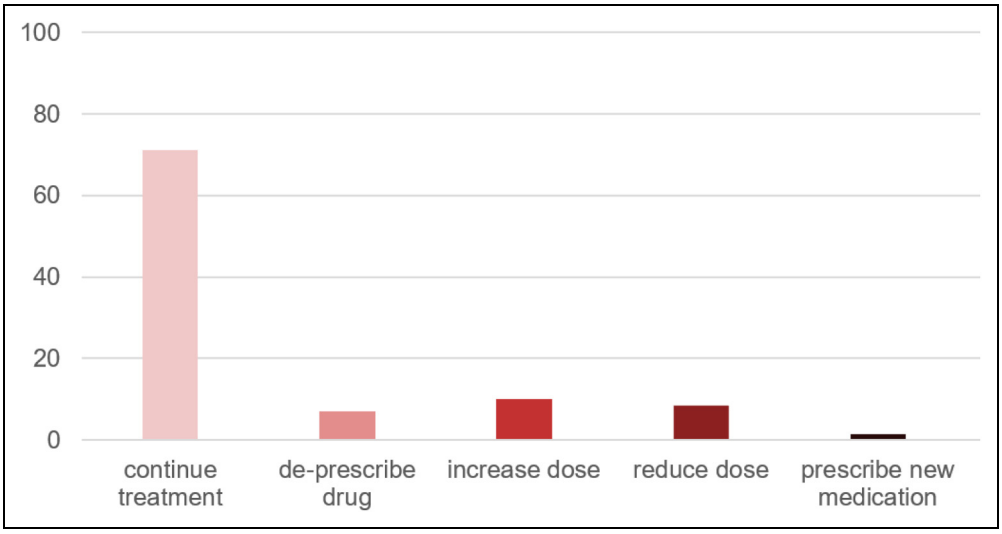

Figure 1. Non-medical prescriber (NMP) clinic medication changes versus % of patients.

Results: The medications prescribed were supporting medication and SACT. The treatments were prescribed in line with local trust guidelines and treatment toxicity. Medication changes included dose increases/decreases and delaying treatment, as per local guidelines. 70% of patients' treatment continued to the next cycle with the same dose, 10% of treatments had dose increases and 8.5% of treatments had dose reductions (Figure 1). Laxatives, antiemetics and pain control were the most commonly prescribed drugs for toxicity.

Clinic appointments were for 30 min, and the duration of patient consultations ranged from 30 to 60 min. NMPs reviewed patients regularly prior to each cycle of treatment. Referrals were made to palliative care or to the GP for a change to regular prescription. NMPs were able to successfully deal with problems and treatments for the patients. In addition to working in SACT review clinics, some NMPs worked in palliative care or onwards.

Discussion and conclusion: OUHFT cancer centre workload has increased by 10%–12% annually due to the increase in

- SACT delivery and complexity
- patient survival
- number of lines of SACT treatment available
- number of drugs and regimens available for cancer treatment

NMP clinics enable follow-up and treatment of the expanding numbers of SACT-treated oncology patients, complementing the multidisciplinary team and increasing clinic capacity. The COVID-19 pandemic has driven trends for oral systemic anticancer treatment and telemedicine consultations. NMP clinics reduce the workload of the medical team and ensure that patients are reviewed in a timely manner, and telemedicine clinics increase clinic room capacity.

The limitation of this study was the small sample of patients reviewed for only one SACT cycle. The study could be expanded to analyse the percentage of NMP clinic reviews compared to the total number of all healthcare professional clinic reviews. Future research could compare the treatments and differences in prescribing activity pre- and post-COVID-19 pandemic.

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Abstract 7
Type: Poster
Category: Audit

An audit of the monitoring and management of proteinuria in hepatocellular carcinoma patients treated with lenvatinib

Lucy Cox

Background: Lenvatinib is an oral multi-kinase inhibitor approved for the treatment of advanced, unresectable, and untreated hepatocellular carcinoma (HCC).[1] Proteinuria is a well-documented adverse effect associated with an increased risk of progressive renal damage.[2–4]

The Royal Free Hospital (RFH) protocol for lenvatinib monitoring necessitates proteinuria screening at days one and 15 of the first two cycles and day one of the subsequent cycles.[1,2,5] Proteinuria ≥ 2+ on dipstick testing requires a 24-h urine protein collection. Treatment is held until urine protein is shown to be < 2 g/24 h.
Proteinuria monitoring was historically performed in-person at RFH. Since the Covid-19 pandemic and the shift towards virtual appointments, there have been significant barriers to accessing such results. These difficulties can result in delayed prescribing, clinical verification, and supply.

Aim: The project aim was to evaluate adherence to RFH guidance for proteinuria monitoring and management in all patients with HCC treated with lenvatinib. Audit standards were defined in Table 1.

Method: A retrospective audit of all patients prescribed lenvatinib for HCC between 01 August 2020 and 30 September 2021. Ethics approval was not required. ChemoCare and the electronic prescribing system, Cerner, were used to identify patients and capture:

The date, location, and result of urinalysis testing if performed.

The date and result of quantitative urine protein collection testing if performed.[2]

Dosing of subsequent lenvatinib treatment.

Table 1. Compliance with audit standards based on RFH protocol.

Standard	Target compliance	Achieved compliance
1 – 100% of cycles one and two have urinalysis monitored on days one and 15 prior to prescription.	100%	39% (15/38)
2 – 100% of cycles from cycle three onwards have urinalysis monitored on day one prior to prescription.	100%	69% (31/45)
3 – 100% of cases of proteinuria ≥ 2+ detected by urine dipstick testing have treatment withheld.	100%	38% (5/13)
4 – 100% of cases of proteinuria ≥ 2+ detected by urine dipstick testing have a 24-h urine protein collection.	100%	31% (4/13)
5 – 100% of cases have treatment re-started at the appropriate dose when the 24-h urine collection is < 2 g/24 h.	100%	75% (3/4)

A data collection tool was designed. A sample size of 83 prescriptions was analysed. Clinical trial patients were excluded. A pilot of eight prescriptions resulted in a narrowing of the audit scope.

Discussion: For patients treated with lenvatinib at RFH, only 39% had urinalysis performed on days one and 15 of the first two cycles versus 69% on day one of the subsequent cycles. The unexpected improvement in urinalysis monitoring with subsequent cycles is likely explained by the less demanding requirement.

60% of urinalysis was undertaken in primary care and 38% at the RFH. The remaining 2% self-monitored at home. The strain on accessing primary care services, exacerbated by the Covid-19 pandemic, may have posed unforeseen barriers to accessing monitoring and therefore compliance.

For patients with urine dipstick proteinuria ≥ 2+, treatment was held in only 38% of cases. Decisions to continue treatment were made if other markers of renal function, such as creatinine, were stable. Less than one-third of these patients (31%) went on to have 24-h urine protein collection performed. However, almost half (46%) of patients had a urine protein: creatinine ratio (UPCR) spot test instead; a faster and less burdensome qualitative tool.[3] Of those who had a 24-h urine protein collection, 75% had treatment re-started at an appropriate dose.

Data collection was limited by retrospective analysis of poor documentation. Those with a UPCR instead of 24-h urine protein collection were deemed non-compliant with RFH protocol.

Conclusion: Generally, although compliance with monitoring was poor, there were numerous mitigating factors to explain this nonadherence. Further research is needed to establish the clinical benefit of such stringent monitoring guidance.

Recommendations: Education and provision of urine dipstick test to patients for self-monitoring.

Proposal to recommend UPCR testing as first-line urinalysis where proteinuria ≥2+.[3]

Research to establish whether less frequent urinalysis monitoring has a significant impact in identifying cases of lenvatinib-associated renal disease.[4]

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Abstract 8
Type: Poster
Category: Audit

Collaborative audit of the implementation of palbociclib access programme across five cancer centres updated 2020

Helen Flint, Suzanne Frank, Rose Oliver, Teresa Chu, Elizabeth Reay and Helen Wong

Introduction: In April 2017 Pfizer opened a Free of Charge Programme for patients prescribed palbociclib within its licensed indication for hormone receptor-positive, HER2 negative, previously untreated metastatic breast cancer when given in combination with an aromatase inhibitor.

In clinical trials, there was a 66% incidence of grade 3 neutropenia (ref 1) and therefore a combined audit was implemented with results from Clatterbridge Cancer Centre, The Christie, Betsi Cadwaladr University Health Board, Newcastle Upon Tyne Hospitals and University Hospitals Birmingham presented at BOPA 2018 abstract 4 and ISOPP 2019 abstract 027. This abstract is an update on progression-free survival.

Method: Ongoing review of case notes of all patients enrolled in the programme, with data analysis on 31 March 2022.

The Kaplan-Meier method was used to estimate progression-free survival (PFS). Patients without a progression event were censored and analyses were performed using a data cut-off date of 31 March 2022. All statistical analyses were completed by IBM Corp. and Released in 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.

For patients that discontinued palbociclib and continued letrozole for a longer duration and have since progressed, the date of progression on letrozole has been included in the PFS analysis.

Results: A total of 142 patients were registered with the scheme, with 12 patients not starting treatment with palbociclib. 130 patients commenced treatment between May 2017 and February 2018; on 31 March 2022 31 patients remain on treatment

Table 1	125 mg	100 mg	75 mg	Stopped – PD	Stopped – other
31 March 2019	33	21	11	47	18
31 March 2020	20	19	14	57	20
31 March 2022	9	13	9	81	18

Two patients whose treatment was paused during 2020 were able to resolve when their other conditions improved (infection and second primary cancer). Six patients that discontinued palbociclib due to myelosuppression or ongoing infection risk continued with letrozole and remain on treatment, these are not included in patients who have progressed in the PFS analysis.

One patient has moved out of the UK and we no longer have records for her treatment, and a further patient stopped attending appointments. Seven discontinued for other toxicities, one patient had a complete response and went on to surgery, one patient stopped treatment due to second cancer and one had bowel perforation early in treatment which was not related to treatment. The remaining patients stopped treatment due to disease progression.

Median progression-free survival is estimated at 30 months (with a 95% confidence interval of 22–38 months).

Discussion: 24% of patients commencing treatment with palbociclib in the free access programme remain on treatment with a median PFS comparable to the registration studies. There have been no new safety concerns.

Abstract 9
Type: Poster
Category: Audit

An audit of the post-administration monitoring and documentation of subcutaneous daratumumab at the University Hospital of Wales

Ruth Jones and Angharad Atkinson

Introduction: Subcutaneous daratumumab was granted a European Commission marketing authorisation in June 2020. Indications include initial multiple myeloma treatment and relapsed or refractory multiple myeloma. In the University Hospital of Wales (UHW) the majority of doses are administered in the haematology day centre (HDC). Due to the risk of adverse reactions, guidelines for post-dose monitoring are in place.

A subcutaneous formulation offers a promising step towards self-administration of daratumumab by patients, however, to initiate home therapy, assurances would have to be in place that daratumumab had been tolerated without adverse reaction under the supervision of a healthcare professional. Documentation of daratumumab administration and monitoring is therefore a relevant and timely issue as we consider how home therapy will be initiated safely.

Objectives: To review whether the administration and monitoring of subcutaneous daratumumab are appropriately documented.

To review whether patients receiving subcutaneous daratumumab are appropriately monitored after administration.

Method: Retrospective data were gathered for subcutaneous daratumumab administrations (in any regime) at UHW. A total of 423 administrations between August 2020 and May 2022 were audited.

Data was collected from chemotherapy administration charts, and from additional documentation in the chemotherapy folder (e.g. NEWS charts), this was recorded anonymously.

Standards

1. Time of administration should be documented.[2]
2. Patients should be monitored post-administration.[1]
3. Patients should be monitored for 30 min after administration (per South East Wales Network Chemocare validation).

   Additional standards, based on guidance from other centres (to compare local and national practice)
4. Post-administration monitoring should include blood pressure, heart rate, temperature and respiratory rate.[3]

Post-administration monitoring at 30 min was defined as having observations recorded between 25 and 35 min post-daratumumab. All standards should be met for 100% of administrations.

Discussion

Standard	Target	Results
Time of administration documented	100%	74% (n = 313)
Post-administration monitoring documented	100%	96% (n = 408)
Post-administration monitoring was conducted and documented between 25 and 35 min	100%	29% (n = 122)
Post-administration monitoring included blood pressure, heart rate, temperature and respiratory rate	100%	94% (n = 401)

While post-administration monitoring was recorded for 96% of doses, this occurred between 25 and 35 min after recorded administration for only 29% of doses. Due to; no administration time recorded (n = 98), no observation time recorded (n = 29), no post-administration observations recorded (n = 15), and observations recorded before 25 min or after 35 min (n = 157).

Limitations include that chemotherapy folders are separate from patients' medical notes, therefore additional information may be recorded elsewhere which is missing from data.

Conclusion: Administration and monitoring of subcutaneous daratumumab were not always appropriately documented, and in some cases, patients were not appropriately monitored following administration.

It is hoped this audit may form the basis for quality improvement work investigating barriers to monitoring and documentation. This, hopefully, will lead to clear documentation of the administration and monitoring of subcutaneous daratumumab in HDC, allowing the identification of those patients for whom self-administration is a feasible option.

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Abstract 10
Type: Poster
Category: Audit

Audit to assess the compliance of hepatitis B virus serology screening prior to Rituximab treatment for haematology-oncology patients

Ekta Solanki and Rakesh Mattu

Background: HBV reactivation is a serious complication in patients receiving systemic anti-cancer therapy (SACT) associated with a high risk of HBV reactivation, for example, Rituximab.[1,2] At Barts Health NHS Trust guidance for the screening and verification process for SACT associated with a high risk of HBV reactivation was introduced in December 2020 to help identify at-risk patients and those who may require antiviral therapy prior to initiating HBV reactivating drugs.[3]

The main purpose of this audit was to:

1. Assess the level of compliance with locally approved guidelines for performing an HBV serological test (HBV core antibody and HBV surface antigen) a month prior to rituximab treatment. (Standard 1 set at 100%)
2. Assess the number of patients referred to the hepatology team if a positive HBV serology test was noted. (Standard 2 set at 100%)
3. Assess whether HBV serology results were acknowledged by the pharmacist during the SACT screening and verification process. (Standard 3 set at 100%)

Method: A list of patients initiated on rituximab-based regimens was collated using the SACT trust database between May and June 2021. Data on HBV serology tests and hepatology referrals were collected from patients' electronic lab results and notes. Data on pharmacists documenting HBV test results during SACT screening was also collected. All data were analysed to assess standards.

Results: Figure 1. Twenty-seven patients were initiated on rituximab-based regimens between May and June 2021. An average of 81% (n = 22/27) of patients were screened for HBV within a month of initiating rituximab treatment. 33% (n = 1/3) of patients with a positive HBV result were referred to the hepatology team and 100% of

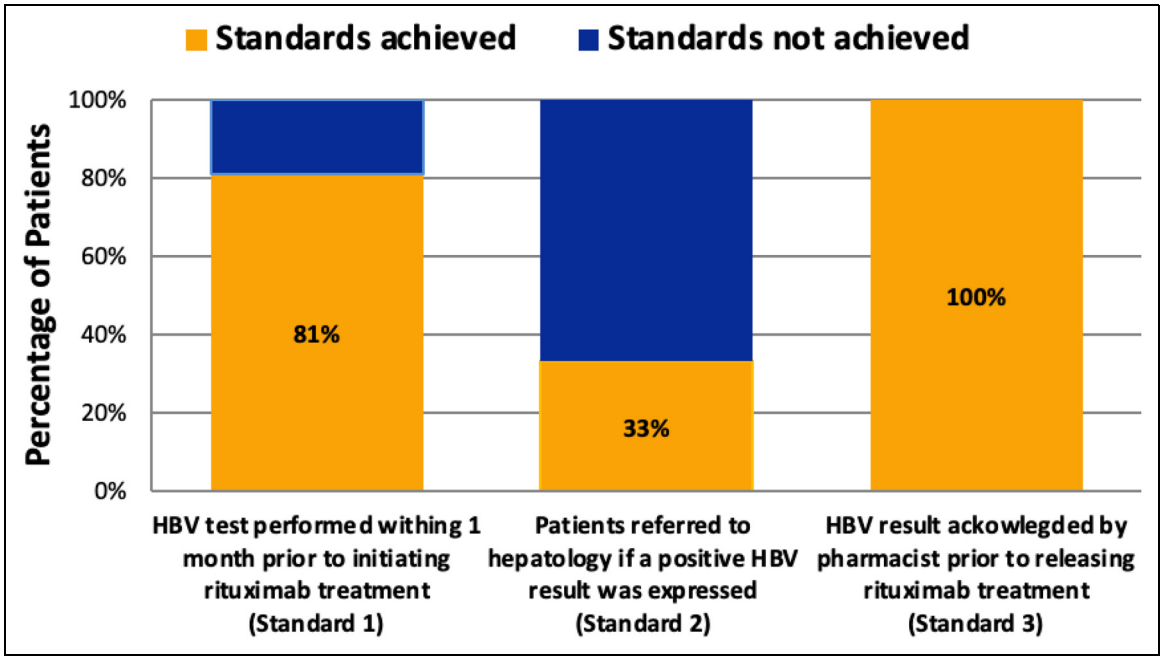

Figure 1. Percentages of adherence to standards.

patients' HBV results were acknowledged by the pharmacist during the SACT verification process. If an HBV test was not done or a positive result was expressed, the pharmacist referred to the medical team and ensured the treatment plan was in place.

Conclusion/discussion: Rituximab-based regimens data was used as a surrogate to assess the overall HBV screening practice at Barts Health NHS Trust. Standard 1 was not met, further analysis showed although 19% of patients' HBV test was done, this was not performed within a month prior to treatment initiation, thus failing the requirements of HBV screening guidance. We have updated our guidelines to state HBV test should be performed ideally within 28 days, but no more than 90 days prior to treatment to account for treatment delays. We have also expanded our scope of drugs to include HBV screening for all SACT in haemato-oncology, not just the MHRA-mandated drugs.

To improve hepatology referral, we have introduced electronic hepatology team referral for patients expressing a positive result. This will allow the appropriate initiation of antiviral treatment prior to initiating HBV-reactivating drugs.

Overall, the audit showed significant improvement in HBV screening practice due to staff training and the involvement of relevant stake holders.

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Abstract 11
Type: Poster
Category: Audit

Intravenous systemic anticancer therapy survey

Professor Rob Duncombe, Emma Foreman and Jurga Biliune

Introduction: For a number of years concerns have been expressed locally, regionally and nationally regarding pharmacy aseptic SACT services and our ability to be able to meet the demand for aseptically prepared products.

While there has been a lot of anecdotes there has not been a great amount of qualitative or quantitative data collected.

Aims/objectives: A survey of those hospitals delivering IV SACT to patients across the UK has been conducted. The survey sought to collect information on the impact of delays in pharmacy on patient experience and looked to determine the degree to which the performance of commercial compounders/NHS units was affecting services to patients.

Methods: The survey was distributed nationally with the help of the BOPA research and audit committee and a number of regional forums.

Results/discussion: The closing date for survey submissions is 31 July 2022. Early results.

1. The survey has generated a high response rate. The response rate from hospitals in England is estimated at 85%. (110 responses from the 129 hospitals delivering SACT (Denominator taken from National SACT database)).
2. 90% of hospitals responding to the survey reported that pharmacy services had been responsible for same-day treatment delays. The predominant reason for these delays is a failure by commercial compounders to fulfil orders.
3. 60% of responders reported pharmacy was responsible for delays in treatment occurring at least weekly.
4. 66% of hospitals reported that on occasion issues in the pharmacy are responsible for patients having to have treatments rescheduled to different days.
5. Less than 50% of hospitals are currently involving the pharmacy department in decisions regarding capacity planning for SACT services.
6. 70 pharmacy departments have received complaints (formal or informal) regarding the delivery of IV SACT in the past 6 months.
7. Most senior pharmacy managers indicated high levels of concern over the delivery of pharmacy SACT services in their hospitals. All are expecting demand for IV SACT to rise in the coming years, however, none are expecting resources to deliver IV SACT to raise at similar rates.

Conclusion: This survey and its results provide a very clear picture of pharmacy IV SACT services across the UK. It confirms the opinions expressed by senior pharmacy leaders that IV SACT services are extremely fragile, and without significant actions to address issues around demand, supply and

workforce the situation will not improve and is highly likely to deteriorate in the coming years.

Upon survey completion, the authors, with BOPA, will compile a compressive report which will contain all data collected.

The aim will be to share the report widely and to use this as a means by which the current status of pharmacy IV SACT services becomes part of the national discussion about UK cancer services.

Abstract 12
Type: Poster
Category: Audit

National survey on pre-chemotherapy toxicity assessment: Identifying the variation between sites when blood are taken

Sidra Awan, Pooja Bharucha and Pinkie Chambers

Introduction: Systemic anti-cancer treatment (SACT) requires toxicity assessment prior to initiation to ensure adequate bone marrow, renal and liver function. The timing of these assessments is determined locally, with the results guiding clinicians to delay treatment or request for repeated blood tests if the desired range is not attained. The time to obtain these tests is ideal on the day chemotherapy commences, however, this is not practical within the NHS. Common practice is for patients to undergo these assessments prior to the treatment day with some policies[1] recommended earlier at five or six days prior to initiations with potential impact on patient experience.
This research aims to study the main policies relating to pre-chemotherapy assessment in three cancer groups: early breast cancer, colorectal cancer and DLBCL.

Objectives: (1) Examine the policies on the time-periods used to perform toxicity assessment prior to chemotherapy at hospitals in the United Kingdom (UK). (2) Identify if there is variation reported within the same hospital sites.

Methods: A cross-sectional online survey (Qualtrics) was sent out to members of the BOPA and ACP society between 1 July 2020 and 31 July 2020.

The survey was validated by four experts in survey design and chemotherapy regimen.

The sample size was calculated based on the total population of hospitals in the UK (n = 256). Based on a 95% CI, n = 131 was needed.

Data was exported and analysed on STATA 15 and presented as counts and percentages.

Ethics was obtained and findings have been recently published in objective 1 only.

Results:

- 91 participants completed the questionnaire in full.
- 25 hospitals had more than one profession/participant responding.
  - 12 hospitals had complete responses for each question from each participant.
    - Two hospitals had participants responding within the same time frame. In both settings, the responses were from the same profession.
      - Hospital A: ×2 participants (pharmacists)
      - Hospital B: ×4 participants (medical oncologists)
    - 10 hospitals had different responses despite the profession with a difference in the time frame from 1 to 4 days between respondents.

Discussion/conclusion: Toxicity assessments guide clinicians on dose delay and dose intensity of chemotherapy. Policies on when to conduct these assessments vary across the UK irrespective of the chemotherapy in all

Table 1. A number of days pre-treatment a patient would have a toxicity blood assessment.

Chemotherapy	Cancer	Within 1 and 2 days	Within 72 h	4 days or above	No guidance	Unknown/not used
FEC *N* = 91	Breast	20 (22%)	25 (27%)	13 (14%)	4 (4%)	29 (32%)
EC *N* = 91	Breast	23 (25%)	29 (32%)	14 (15%	3 (%)	22 (24%)
Docetaxel *N* = 91	Breast	23 (25%)	31 (34%)	15 (16%)	3 (%)	19 (21%)
IrMDG *N* = 91	Colorectal *Palliative	26 (29%)	26 (29%)	15 (16%)	2 (2%)	22 (24%)
OXMDG *N* = 91	Colorectal *Palliative	26 (29%)	26 (29%)	15 (16%)	2 (%)	22 (24%)
OXMDG *N* = 88	Colorectal *Adjuvant	25 (27%)	27 (30%)	14 (15%)	1 (1%)	21 (24%)
OXCAP21 *N* = 91	Colorectal	24 (26%	27 (30%)	17 (19%)	2 (2%)	21 (23%)
OXCAP14 *N* = 91	Colorectal	22 (24%))	22 (24%)	13 (14%)	1 (1%)	33 (36%)
R-CHOP *N* = 91	DLBCL	13 (14%)	22 (24%)	29 (32%)	2 (2%)	25 (27%)

three cancer groups. Results demonstrate there is variation at the same hospital site despite professional background.

As cancer patient numbers are growing and advanced preparation is vital, many hospitals are investigating extending the validity period of blood. Depending on the chemotherapy regimen, between 13 and 15 sites are currently practicing using between 4 and 7 days. However, the more this is extended there may be a need for duplicate blood where patients do not reach desired thresholds.[1]

Further evidence is required in this area and the need to reduce variation in pre-chemotherapy blood assessments at the same site and across sites within the UK.

This study was limited by its method of dissemination, with the majority of respondents receiving a response from their membership societies, where members pay to join.

Reference

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Abstract 13
Type: Poster
Category: Audit

Assessment of the pilot bortezomib self-administration service at University College London NHS Foundation Trust (UCLH) – A service audit

May Low

Background: University College London Hospital (UCLH) launched a pilot bortezomib self-administration service for myeloma patients to deliver care closer to home and improve the experience. Self-administration of systemic anti-cancer therapy (SACT) should reduce chemotherapy unit pressures and aseptic workload by utilising outsourced SACT with an extended expiration. Regimens containing bortezomib and dexamethasone with cyclophosphamide or thalidomide were eligible for the pilot service. Patients were assessed for suitability for self-administration, consented to self-administration and trained during their first cycle of treatment. For subsequent cycles, patients attended daycare for the administration of their first dose and subsequent doses within the cycle were collected by or delivered to the patient. On self-administration treatment days, a trained nurse conducted telephone consultations to assess toxicity and ensure the safe administration of SACT.

Aims/objectives

- To assess the safety of bortezomib self-administration over 12 months.
- To confirm all self-administered doses complied with the service pathway processes.
- To verify standards were met as outlined in the Trust self-administration of subcutaneous SACT policy for three treatment cycles.

Methods: Patients enrolled in the pilot service between June 2021 to June 2022 were identified using the Trust electronic prescribing system (Epic®). Patients who had completed treatment were assessed for the safety and efficiency of the self-administration service. Three treatment cycles were audited against the standards outlined in the self-administration of the subcutaneous SACT Trust policy. Data were collected retrospectively and analysed on Microsoft Excel with anonymised patient identifiable information.

Results: Thirteen patients were enrolled in the pilot service but only 10 had completed treatment with three still receiving active treatment. A total of 174 Bortezomib doses were

Table 1. Bortezomib self-administration safety and compliance with policy standards from three treatment cycles of 10 patients who have completed treatment.

Audit criteria	Standard	Compliance
Patients consented to the self-administration at home pathway (n = 10)	100%	100%
Patients/carers assessed competent by a daycare nurse (n = 10)	100%	100%
Patients completed training for self-administration of subcutaneous injection (n = 10)	100%	100%
Blood results reviewed prior to starting the treatment cycle (n = 30)	100%	100%
Doses dual-checked prior to delivery (n = 90)	100%	100%
Doses delivered within the expiry date (n = 90)	100%	93%
Nurse-led telephone consultation performed on each self-administration day (n = 90)	100%	99%
Blood pressure was checked and documented on each self-administration day (n = 90)	100%	96%
No Grade 1 or above injection site adverse events (n = 90)	100%	100%
No Grade 2 or above treatment-related adverse events resulting in dose omission or modification (n = 90)	95%	93%
Self-administered dose recorded on the Medication Administration Sheet (MAR) (n = 90)	100%	93%

self-administered over 12 months. The results of three treatment cycles in 10 patients are listed in Table 1.

Discussion: Bortezomib subcutaneous administration takes 1 h per daycare appointment, therefore 174 appointments over one year equate to 3.5 h per week. However, telephone consultations required an average nursing time of 1 h per week. Self-administration reduced patient visits by 50% per cycle. Self-administration did not result in injection site or administration issues. However, neuropathy was reported in 21 consultations (23%) with three cases warranting dose reduction and six dose omissions. All toxicities were referred to the clinical team and managed accordingly. Two doses were wasted due to dose omission post-delivery. The review showed overall good compliance towards Trust policy and processes for self-administration. Non-compliance was due to a lack of data due to lost of follow-up and missing documentation, for example, courier checklist, consultation notes and blood pressure checks.

Conclusion: Bortezomib self-administration can be safely delivered to improve overall patient experience and service efficiency. Feedback to relevant staff to improve adherence to standards such as documentation of consultations, blood pressure checks and recording of doses administered. Expand service to daratumumab-containing regimens for self-administration to increase patient numbers. Re-evaluate the service with more enrolled patients to ensure standards are maintained.

Abstract 14
Type: Poster
Category: Audit

Audit project: Measuring baseline HbA1C and blood glucose for adults commencing systemic anticancer treatment

Connie Nicholls and Eve Blackmore

Background: National guidance was released in 2021 on appropriate testing and treatment of diabetes/hyperglycaemia in patients commencing SACT.$_1$ Baseline HbA1C and Capillary Blood Glucose (CBG) are recommended for most regimes.

20% of people living with cancer also have diabetes. Non-diabetics commencing Systemic Anti-Cancer Treatment (SACT) are at risk of developing new-onset diabetes or hyperglycaemia.[1]

Glycaemic control is essential to improve patient outcomes.

- Concurrent cancer and diabetes/hyperglycaemia are prognostic of worse overall survival and cancer recurrence.
- Hyperglycaemia can reduce the efficacy of chemotherapy treatment resulting in chemotherapy-resistance.
- Symptoms of hyperglycaemia (fatigue, dry mouth, infections and poor wound healing) coupled with chemotherapy side effects can be debilitating.
- The risks of toxicities are increased, for example, chemotherapy-induced neutropenia. Incidence has been shown to be higher in patients with diabetes or hyperglycaemia, posing a high risk of infection and hospitalisation, and following morbidity and mortality.[1]

Objective:

Aim: To identify whether adults commencing SACT in UHBW have baseline HbA1C and CBG tests.
Objective: To measure compliance within the Trust against national guidance for baseline diabetic monitoring prior to SACT.[1]

Standards

1. 100% of patients commencing on SACT should have a baseline HbA1C within 3 months before starting.
2. 100% of patients commencing on SACT should have a random CBG test within 1 month before starting.

Treatment decisions would not be based on results outside of these timeframes. Exceptions were candidates that refused a blood test.

Method: This retrospective audit included adults (> 18 years) who started cycle 1 of SACT between 05 October 2021 and 08 December 2021 at UHBW. SACT included cytotoxic and immunotherapies.

A pilot was carried out with five patients and the data collection form was adjusted. For the audit, a total of 50 patients were identified using ChemoCare. Data was collected by trainee pharmacists using the hospital's test reporting system (ICE) and, if insufficient data, electronic patient notes were checked. The data was documented and analysed using Microsoft Excel. This study did not require ethics approval.

Results: Of patients commencing SACT:

1. 16% (n8) had a baseline HbA1C test within 3 months prior to SACT.
2. 26% (n13) had a CBG test within 1 month prior to SACT.

Three patients had an HbA1C test both before and after SACT. Two of these saw a rise in HbA1C of at least 4%. Clinically, this resulted in one patient being re-classified as diabetic (HbA1C 49%) and the other as pre-diabetic (HbA1C 44%) according to national guidance.

Conclusions: For the majority of patients, baseline HbA1C and CBG were not measured. Potential reasons include

- Poor awareness of this national guidance.
- Poor awareness regarding the risk of hyperglycaemia/diabetes with SACT.
- Time pressures in clinics.

A limitation of this study is hand written medical notes were not examined; CBG results could have been recorded and not transferred online.

We recommend the inclusion of HbA1C and CBG tests in standard SACT pre-cycle blood requests to achieve targets of 100% as well as risk assessments for patients consenting to the high-risk regimes or on steroids. Some protocols have been updated with these recommendations.

Reference

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Abstract 15
Type: Poster
Category: Audit

Ongoing systemic anti-cancer treatment drug interactions – A retrospective, single centre audit of practice

Rizwana Patel, Aamira Manjra and Andrew Walker

Background: Systemic anti-cancer treatments (SACTs) are high-risk medications with narrow therapeutic indexes and complex dosing used to treat many haematological and oncological cancers. SACT can interact with a variety of non-chemotherapy medications used by patients, thus leading to the potential ineffectiveness of treatment and/or significant side effects.[1,2]

A recent study suggests that 2% of hospitalisations of cancer patients arise as a consequence of drug interactions.[3] However, data to define the incidence and severity of SACT interactions is less well defined, with the most recent systematic review citing limitations in the underpinning evidence base.[4]

Current practice involves a medicine reconciliation at the point of diagnosis, or when patients change regimens, conducted by the prescribing clinician and/or the validating pharmacist. While this serves to identify drug interactions on initiation of SACT, there is no provision for ongoing identification of interactions within the current service model. An audit was conducted to investigate this issue.

Aim: To identify the incidence and severity of SACT: non-SACT drug interactions within a sample of cancer patients receiving ongoing treatment.

Methodology: A retrospective, single-centre audit of patients receiving ongoing SACT within the preceding year was conducted. A sample of 10 patients per disease state was selected randomly using data captured within Chemocare (n = 100). Patients receiving a first cycle of SACT were excluded. Patients' most recent, ongoing SACT treatment was identified via Chemocare and prescribed non-SACT treatments were identified using summary care records (SCRs) and electronic hospital records. Interactions were identified using Stockleys online and the University of Liverpool cancer drug interaction checker, and severity was defined using BNF classifications. Interactions were identified by two independent researchers, and differences were resolved through review by an independent third researcher. Results were analysed using Microsoft Excel®.

Results: 52% of patients sampled experienced an interaction (Table 1), with 284 potential SACT: non-SACT interactions identified. Of these 3.5% were classified as mild, 39.1% were moderate and 57.4% were severe (Figure 1).

A breakdown of these interactions per tumour site is provided in Figure 2.

An outline of the five most commonly occurring interaction subtypes per severity grade is provided in Table 2.

Discussion: This audit has highlighted a significant unmet clinical issue regarding the identification of SACT: non-SACT drug interactions for patients with ongoing treatments.

Table 1. The proportion of sampled patients who experienced an interaction (all grades, n = 10 for each malignant condition).

Malignant condition	% of patients who experienced an interaction
Leukaemia	80
Myeloma	70
Lymphoma	60
Myeloproliferative disorders	50
Prostate cancer	90
Breast cancer	60
Gynaecological cancer	70
Upper GI cancer	60
Lower GI cancer	80
Lung cancer	50
Average of the combined results	**52**

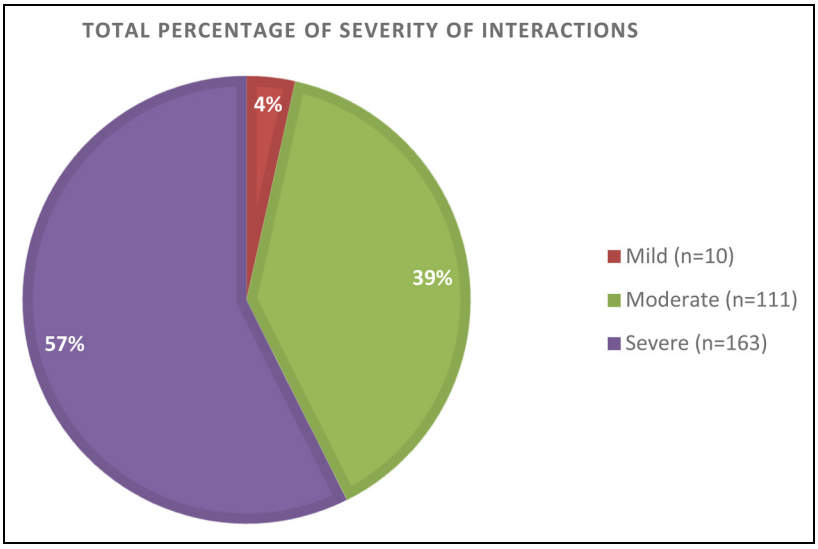

Figure 1. The severity of interactions identified (combined totals for all conditions).

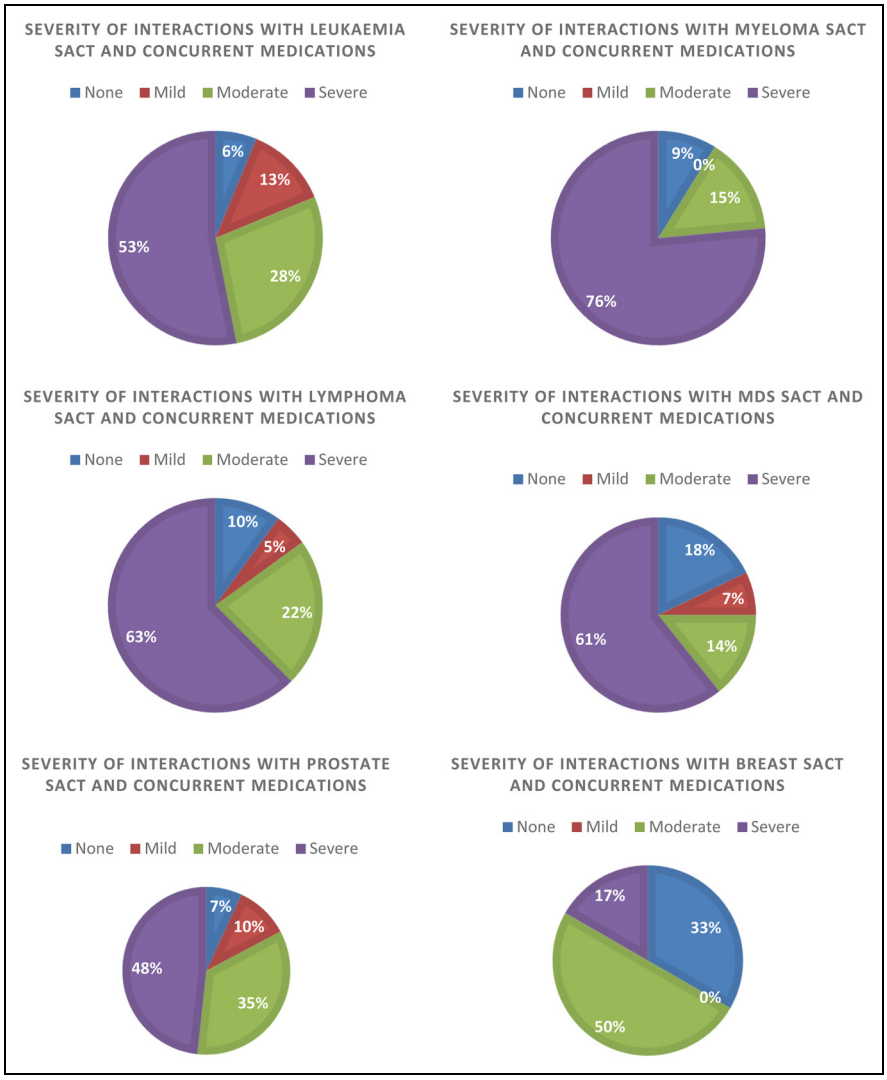

Figure 2. The severity of interactions for each tumour site.

The data presented is subject to a number of limitations. A small sample size may bias the results and provide an unrepresentative picture. This audit did not examine SACT: OTC or SACT: food interactions, the inclusion of these factors would likely increase the number of interactions identified.[5] A larger scale project to identify SACT: non-SACT drug interactions, with the inclusion of patient interviews to establish the impact of interactions identified, may provide a more robust methodology for future research.

This evidence suggests that cancer patients should receive more regular medicine reconciliations to identify interactions. Embedding pharmacy staff within clinics and on-day units would likely facilitate this process and increase the team's ability to identify interactions, contributing to patient safety. A business case is being considered to support this development.

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Abstract 16
Type: Oral & Poster
Category: Research

Is there justification for wider DPYD variant testing? – An evaluation of our experience with the ToxNav test at Oxford University Hospitals NHS Foundation Trust

Catherine Chaytor

Background: The enzyme dihydropyrimidine dehydrogenase (DPD) is the rate-limiting enzyme in the breakdown of 5-fluorouracil (5-FU) and its prodrug capecitabine. Genetic variations in the DPYD gene can lead to patients experiencing severe or life-threatening toxicity. On 1 June 2019, Oxford University Hospitals NHS Foundation Trust (OUHFT) began testing all patients, prior to commencing 5-FU or capecitabine, for DPYD variants using the ToxNav branded test, under a local funding agreement. The ToxNav test detects the presence of 20 genotypic variants of the DPYD gene. In November 2020, NHSE began commissioning DPYD testing delivered by the national NHS Genomic Laboratory Hubs (GLHs). The GLH test commissioned by NHSE screens for the four most common DPYD variants found in the UK population.

Aim: The aim of this evaluation was to assess the potential impact of changing over to the GLH test from the ToxNav test.

Objectives

- Identify the number of variants identified with the ToxNav at OUHFT from 01 June 2022 to 31 January 2022
- Identify which of these variants were outside of the GLH 4 panel test
- Consider the ethnicity of patients with rarer variants picked up in the ToxNav test

Methods: A download of OUHFT patients tested for with the ToxNav test from 01 June 2019 to 31 January 2022 was obtained from the laboratory.

The results were analysed to assess the frequency of variants and comparison made with the known variants included in the GLH test panel.

Patient medical records were reviewed for any patients expressing a variant not included in the GLH panel to determine the ethnic origin of the patient.

Results: 1286 patients underwent testing with the ToxNav test in the time period. 75 patients were designated as having a high-risk DPD deficiency and one patient was a critical risk. Table 1 summarises the results.

Two of the 1286 patients tested were found to have a potentially significant variant in the DPYD gene, where an upfront dose reduction was recommended, that would not have been identified in the GLH test. One of these patients was categorised as 'White British' on the electronic patient record and the other patient was categorised as 'Asian or Asian British – Indian'.
852 patients were identified as having a variant in the DPYD gene that increases the risk of Plantar Palmer Toxicity but upfront dose reduction is not recommended for this variant.

Table 1.

Variant(s) identified	Risk grade	Included in the GLH test?	Number of times identified	Total number of times tested for	Percentage rate of occurrence
rs67376798 Heterozygous	High	Yes	16	1286	1.24
rs3918290 Heterozygous	High	Yes	16	1286	1.24
rs55886062 Heterozygous	High	Yes	1	1286	0.08
rs56038477 Heterozygous	High	Yes	40	766	5.22
rs3918290/ rs56038477 Compound heterozygous	Critical	Yes	1	766	0.13
A551T Heterozygous	High	No	1	1286	0.08
rs72549309 Heterozygous	High	No	1	1286	0.08
Total			**76**		

The N.B. rs56038477 variant was only tested in August 2020.

Discussion: As the GLH DPYD genomic test only looks for the 4 most common variants, there is a potential to miss potentially significant variants that are found less commonly in the UK population, particular in patients from non-white British ethnic origins. The rate of occurrence of these rarer variants in our study sample was 0.16%, however, it should be noted that our patient demographic in Oxfordshire is predominantly White, and British and is therefore not representative of the potential scale of the problem in other areas of the country. More work is required to further assess the potential significance of rarer DPYD variants not included in the NHSE commissioned test.

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Abstract 17
Type: Oral & Poster
Category: Research

An exploratory study to examine differences in adverse drug reactions experienced by male and female patients taking tyrosine kinase inhibitors at a tertiary cancer centre

Clare Geoghegan, Rebecca Burgoyne, Emily Green and Eleanor Ball

Background: Female patients continue to be underrepresented in oncology clinical trials, owing to the thalidomide tragedy in the 1950s and the interpretation of subsequent guidance to exclude women of child-bearing age.[1] Studies have shown that this lack of female inclusion has led to suboptimal healthcare, adverse medical outcomes, and higher reporting of adverse drug reactions (ADRs).[2] There are significant physiological differences between female and male patients that impact the pharmacokinetics and pharmacodynamics of drugs.[3] Tyrosine kinase inhibitors (TKIs) are an effective targeted treatment of many malignancies. Adverse drug reactions include haematological adverse effects, fatigue, oedema, nausea, hypothyroidism, diarrhoea and cardiac toxicity.[4] Severity of ADRs can vary; from mild and self-limiting to life-threatening symptoms requiring urgent intervention. Despite the emphasis on personalised medicine, little is understood about the impact of sex on the nature and severity of ADRs.[5]

Aims and objectives: To identify if there are any differences in adverse drug reactions specific to sex for patients' TKIs. To evaluate the rate (%) of adverse drug reactions by grade experienced by male and female patients initiated on TKIs between January 2021 and December 2021 across solid tumour malignancies and haematological cancers.

Method: A retrospective pilot study of male and female patients started on TKIs during the study period was

conducted. Patients were identified using a custom-made report on the electronic health record system. Clinician's progress notes and blood results were reviewed to identify ADRs throughout treatment. Adverse drug reactions were grouped/categorised by System Organ Class and graded according to CTCAE v5.[6] Data collected included nature and grading of ADRs, age, sex, ethnicity, treatment and treatment intent. Patients receiving treatment within a clinical trial, in combination with other agents, or those diagnosed with acute myeloid leukaemia were excluded.

Results: A total of 48 patients were included (median age 60.5 years [21–86]), 54.1% female rate. Patients of black ethnic backgrounds were not equally represented in both groups: 4.5% of males compared with 15.4% of females. The frequency and grading of ADRs for patients included in this study are summarised in Table 1.

Overall, 26.9% and 15.4% of female patients experienced grade 2 and grade 3 ADRs compared with 18.2% and 0% of male patients. The most common ADRs for females were gastrointestinal, general malaise, and respiratory in nature whereas males experienced gastrointestinal events, blood disorders or other effects.

Discussion: Differences observed may be due to increased reporting of ADRs, although this is unlikely for higher severity ADRs. Limitations of this study include that data collection relied on the reporting of ADRs by patients and subsequent documentation by clinicians. It was noted that there was a variation in the detail of documentation between clinicians.

This study indicates there may be sex-specific characteristics that impact patient tolerability of TKIs. Further collaborative data collection is required to help draw robust conclusions. Knowledge of the impact of sex on ADRs could influence how patients are managed, for example, sex-specific dosing, monitoring and provision of supportive care for those at greater risk of certain adverse effects and patient education.

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Abstract 18
Type: Poster
Category: Research

Nephrotoxicity: A major problem among adult cancer patients treated with chemotherapy at Uganda Cancer Institute, Mbarara Regional Cancer Centre, Uganda

John Isiiko, Barnabas Atwiine and Joseph Oloro

Objective: Nephrotoxicity is common among cancer patients receiving chemotherapy. Some anti-cancer drugs, especially platinum derivatives, are nephrotoxic and have narrow therapeutic indices. If nephrotoxicity is not managed, it can injure the kidneys, resulting in uncontrolled blood pressure, hormonal imbalance, electrolyte imbalance, body fluid imbalance and death. Nevertheless, the burden of nephrotoxicity among adult cancer patients in Uganda is not documented in the literature.

This study assessed the prevalence, severity and associated factors of nephrotoxicity among adult cancer patients receiving chemotherapy at the Uganda Cancer Institute, Mbarara Regional Cancer Centre (UCI-MRCC).

Methods: The study was a cross-sectional study carried out at the UCI-MRCC, Uganda. A total of 206 adult cancer patients who received at least three cycles of chemotherapy were included in the study. A data collection form was used to collect data, which was recorded in Microsoft Excel version 2016. Data were analyzed using Stata version 15.1 and the severity of nephrotoxicity was graded based on the Common Terminology Criteria for Adverse Events. Ethical approval was obtained from the Research and Ethics Committee of Mbarara University of Science and Technology.

Results: The prevalence of nephrotoxicity was 35.9% (n = 74). The majority of the participants had stage 1 (n = 83, 40.3%) and stage 2 (n = 55, 26.7%) nephrotoxicity. In the multivariate logistic regression of associated factors for nephrotoxicity, age > 50 years old (aOR: 1.80, 95% CI: 1.06, 1.91; $p > 0.001$), hypertension (aOR: 1.71, 95% CI: 1.74, 1.94; $p = 0.011$) and use of platinum agents (aOR: 2.04, 95% CI: 1.82, 3.34; $p = 0.002$) were significant independent factors associated with nephrotoxicity.

Conclusion: About one-third (1/3) of the adult cancer patients at UCI-MRRC develop nephrotoxicity, which indicates a high burden of nephrotoxicity. The prevention of the progression of nephrotoxicity from grades 0, 1 or 2 to grade 3 or 4 is therefore necessary, especially among the patients at high risks, such as the hypertensive and the elderly aged > 50 years old and those who are treated with platinum agents. The effectiveness of the preventive measures of nephrotoxicity among patients receiving platinum-based chemotherapy combinations should be evaluated.

Abstract 19
Type: Poster
Category: Research

Randomized, multicentre, open-label, two-period crossover study to demonstrate Bioequivalence between pegylated liposomal doxorubicin (PLD) and Caelyx® pegylated liposomal doxorubicin in patients with advanced ovarian cancer.

Imran Ahmad, Prakash SS, Rajnish Vasant Nagarkar, Krishna Chaitanya Puligundla, Lokesh KN, Rakesh Reddy Boya, Ankit Baldevbhai Patel, Lovenish Goyal, Aniket Thoke, Jigar Gordhanbhai Patel, Ajay Omprakash Mehta, Ghanshyam Nanubhai Patel, Ronak Patel and Mujtaba A Khan

Objectives: To compare the pharmacokinetic (PK) profile of PLD (test [T]) with Caelyx®, (reference [R]) in patients with advanced ovarian cancer.

Method: This multicentre, open-label, balanced, randomized, two-treatment, two-period, two-sequence, single-dose, crossover, the study was conducted at 12 centres across India. Female patients aged ≥ 18 years and ≤ 75 years with ovarian cancer, whose disease progressed or recurred after platinum-based chemotherapy, and scheduled to start PLD therapy, were included. Patients (n = 50) were randomized to either T or R formulation with equal allocation in each sequence (i.e. 'TR' or 'RT'). Patients were intravenously infused with PLD or Caelyx® (50 mg/m^2 over 1 h) 2 h after breakfast on day 1 of the chemotherapy cycle in period-I and were crossed over to the other arm on day 29 in period II (washout period: 28 days). Estimated primary PK parameters included maximum measured plasma concentration (C_{max}), area under the plasma concentration versus time from time 0 to t (AUC_{0-t}), and AUC from time 0 to ∞ ($AUC_{0-\infty}$). Key secondary parameters included time to reach C_{max} (T_{max}), AUC from time 0 to 48 h (AUC_{0-48}), and AUC from time 48 h to time t (AUC_{48-t}).

Discussion: PK parameters were comparable between test and reference products for both encapsulated and unencapsulated doxorubicin. Test/reference ratios of geometric least square mean and corresponding 90% confidence interval for C_{max}, AUC_{0-t}, and $AUC_{0-\infty}$ were within the acceptance range of 80.00%–125.00% (Table). ANOVA model for statistical analysis utilized to evaluate in-transformed pharmacokinetic parameters based on centre, center*formulation, sequence, sequence*centre, patient (sequence by centre), and formulation and period (centre) effects, to

Table. Bioavailability of PLD and Caelyx® in Patients with Advanced Ovarian Cancer

Parameters	Encapsulated Doxorubicin					Unencapsulated Doxorubicin				
	Geometric Least Squares Means			90%CI	Intra-Patient CV (%)	Geometric Least Squares Means			90%CI	Intra-Patient CV (%)
	PLD (n=50)	Caelyx® (n=50)	Ratio			PLD (n=50)	Caelyx® (n=49)*	Ratio		
$\ln C_{max}$	36902.723	39021.710	94.6	91.94-97.28	8.4	119.743	115.635	103.6	92.08-116.46	35.3
$\ln AUC_{0-t}$	3139300.162	3160177.808	99.3	95.19-103.67	12.7	13529.238	13562.056	99.8	91.91-108.28	24.3
$\ln AUC_{0-\infty}$	3237807.262	3260433.151	99.3	95.13-103.66	12.7	14726.369	14521.978	101.4	93.45-110.05	24.2
$\ln AUC_{0-48}$	1225501.545	1276933.864	96.0	93.70-98.30	7.1	4002.014	3988.060	100.3	91.66-109.87	26.9
$\ln AUC_{48-t}$	1880421.634	1843416.490	102.0	95.66-108.78	19.2	9372.159	9418.035	99.5	91.00-108.82	26.5

*Data for one patient who had pre-dose concentration >5% of C_{max} in period-1 was excluded as per-protocol.

assess significant effects were statistically insignificant. Maximum intra-patient variability (coefficient of variance) was 35.3% (C_{max}) for unencapsulated and 12.7% (AUC_{0-t}) for encapsulated doxorubicin, comparable to the assumed variability for sample size calculation in our study.

Conclusion: The PLD formulation was found to be bioequivalent to Caelyx® (European reference product), well tolerated, and safe. This work was accepted for publication in the European Journal of Pharmaceuticals Sciences (in press) and approved by European Medicines Agency.

Abstract 20
Type: Poster
Category: Research

What patient assessment skills do pharmacist independent prescribers require to prescribe immunomodulators for myeloma?

Anton Slavin

Aim: To gain consensus on the patient assessment skills required by pharmacist-independent prescribers prescribing

Table. National questionnaire results for 12 participants in the myeloma group compared to the genitourinary and lung group consensus study by Allison J et al.

Category	Patient assessment skill statement	Myeloma	GU	Lung
Common SACT toxicities	PIPs should be able to assess performance status	•	•	•
	PIPs should be able to assess general appearance and well being	•	•	•
	PIPs should be able to assess nausea and vomiting	•	•	•
	PIPs should be able to assess diarrhoea	•	•	•
	PIPs should be able to assess constipation	•	–	–
Clinical Examination Skills	PIPs should be able to examine the oral mucosa and tongue	•	–	•
	PIPs should be able to examine the hands	•	–	•
	PIPs should be able to examine the patient's legs, ankles and feet	•	–	•
	PIPs should be able to examine the patient's skin (e.g. rash, shingles, chickenpox, cellulitis)	•	–	•
	PIPs should be able to assess neurotoxicity	•	–	•
	PIPs should be able to assess pain	•	–	–
	PIPs should be able to assess arthralgia	–	•	–
	PIPs should be able to assess vital signs (e.g. BP, HR, temperature, RR)	•	•	•
	PIPs should be able to perform basic chest examination	Δ	Δ	•
	PIPs should be able to perform lymph node palpation	–	O	–
	PIPs should be able to perform abdominal examination	Δ	O	Δ
	PIPs should be able to recognise signs of VTE or PE	•	–	–
	PIPs should be able to assess for signs of hypoglycaemia/hyperglycaemia	•	–	–
	PIPs should be able to assess peripheral oedema	•	–	–
Complications of cancer/SACT	PIPs should be able to identify the signs and symptoms of spinal cord compression	•	•	•
	PIPs should be able to identify the signs and symptoms of neutropenic sepsis	•	•	•
Interpretation of clinical tests	PIPs should be able to interpret blood results as per SACT protocol/MPC	•	–	–
	PIPs should be able to interpret thyroid function test results	•	•	–
	PIPs should be able to interpret mutational status	–	–	•
	PIPs should be able to interpret electrocardiogram results	O	Δ	•
	PIPs should be able to interpret urinalysis results	Δ	•	–
Interpretation of clinical reports	PIPs should be able to interpret CT reports	Δ	–	Δ
	PIPs should be able to interpret left ventricular ejection fraction reports (e.g. ECHO/MUGA)	•	Δ	•
	PIPs should be able to interpret X-ray reports	Δ	•	Δ
	PIPs should be able to interpret ultrasound reports	Δ	Δ	Δ
Emotional and holistic needs assessment	PIPs should be able to assess the emotional needs and psychological impact of treatment	•	•	•
	PIPs should be able to carry out a holistic needs assessment	Δ	Δ	•

Note. SACT, systemic anti-cancer therapy; PIP, pharmacist independent prescriber; MPC, master prescription chart; CT, computerised tomography; BP, blood pressure; HR, heart rate; RR, respiratory rate; ECHO, echocardiogram; MUGA, multiple gated acquisition; VTE, venous thromboembolism; PE, pulmonary embolism; GU, genitourinary cancer.
•: agree (≥70% of participants voted slightly agree, agree or strongly agree); O: disagree (≥70% of participants voted slightly disagree, disagree or strongly disagree); Δ: no consensus; –: considered irrelevant to tumour group.

immunomodulators in myeloma across National Health Service Scotland.

Methods: This was a two-phase study that used the nominal group technique to gain local consensus followed by a two-round eDelphi questionnaire to gain national consensus across all cancer networks.

Setting: This project was conducted across the three cancer networks within NHS Scotland: South East Scotland Cancer Network; West of Scotland Cancer Network and North Cancer Alliance.

Subjects: Participants were invited from each cancer network (South East Scotland Cancer Network, West of Scotland Cancer Network and North Cancer Alliance) and included haematology consultants, haematology specialist registrars, haematology advanced nurse practitioners and haematology pharmacists.

Results: There were five participants in the nominal group technique. Twenty-two out of 31 patient assessment skills gained local consensus, seven patient assessment skills did not gain consensus and two patient assessment skills were deemed irrelevant. There were 12 and 14 participants in rounds one and two of the eDelphi questionnaire, respectively. Twenty-nine patient assessment skills were included in the first-round questionnaire and 21 gained consensus. The remaining eight patient assessment skills were included in round two where seven did not achieve consensus and one achieved disagreement consensus.

Conclusion: This research outlines 21 patient assessment skills required for pharmacist independent prescribers to prescribe immunomodulators for myeloma patients according to haematology specialists in Scotland. Discussion on patient assessment skills without consensus showed that the pharmacist independent prescribers would have a shared responsibility with the consultant. This work should inform the development of a competency framework to allow the training of pharmacist independent prescribers in Scotland. Some patient assessment skills could be transferrable for pharmacist-independent prescribers prescribing systemic anti-cancer therapy for other haematological malignancies.

Abstract 21
Type: Poster
Category: Research

A Survey of Real World Evidence (RWE) use by Cancer Clinicians as part of routine care in Scotland

Jennifer McClintick, Lisa MacLeod, Kelly Baillie, Emma Dunlop, Jennifer Laskey and Marion Bennie

Background: As clinical trials are often highly selective with patient recruitment, there has been increasing interest in recent years in the use of real-world evidence (RWE). RWE may improve understanding of outcomes in patient groups often excluded from trials and the long-term safety and efficacy of medicines.[1]

Much has been done globally to generate RWE in oncology. For example, the Cancer Medicines Outcomes Programme (CMOP), which uses routinely collected NHS data to describe outcomes in cancer patients in Scotland.[2] Clinician support is essential to ensure that the generation of RWE translates into a meaningful impact on patient care. However, limited work has been done to determine clinicians' views of RWE or how it is utilised in practice.

Aims: To understand the views and experiences of medical, nursing and pharmacy staff in cancer services in Scotland on RWE use, including evidence generated through CMOP, in routine practice.

Method: An online survey was sent via email to medical, nursing and pharmacy staff working in cancer services in Scotland in February 2022, and was life for 4 weeks. Prior to dissemination, the survey was piloted by a consultant oncologist and specialist oncology pharmacist. Descriptive statistics were generated for the quantitative data. Qualitative data was analysed by a combination of content and thematic analyses.

Results: 127 respondents took part in the survey; 57% stated they use RWE in their practice. The results from thematic and content analyses of responses to free-text questions on the use and views of RWE are presented in Table 1.

A total of 47 (37%) respondents were aware of CMOP prior to the survey. Most respondents became aware of CMOP through presentations by CMOP team members and word of mouth. Eighteen respondents were aware of specific findings from CMOP studies and, of those, five stated they had used CMOP-generated evidence in their practice. Those clinicians stated the evidence was beneficial and was primarily used in treatment decisions and patient discussions.

Discussion: This is the first study to explore the experiences of Scottish Cancer clinicians on RWE use and the value clinicians see in RWE. However, as a voluntary sampling method was used, the views of the respondents may not represent all Scottish cancer clinicians. As seen in a previous European survey, there is concern about the reliability of RWE and the quality of data from real-world sources.[3] CMOP is not widely known across

Table 1. Thematic/content analysis of free text responses of experience and views of RWE in Scottish Cancer Services.

	Theme	Subtheme
Application of Real World Evidence (RWE) in practice[a]	Informing Routine Care	Patient-level treatment decisions
		Development of guidelines/protocols
		Risk vs Benefit discussions with patients
		Supplementary evidence in areas with little published trial evidence
	Planning and Performance	Monitoring local clinical activity
		Capacity Planning
		Applications for new medicines
	Alongside research	Participate in research activities
		Compare local datasets to larger datasets (trial and real world)
Views of RWE[b]	Improved patient centred care	A greater understanding of outcomes in the local population
		Informed decision making
	RWE challenges	Bias within RWE
		Limited numbers in real-world studies
		Concern over quality/reliability of data source
	RWE enhances evidence base	Exclusivity of Randomised controlled trials (RCTs)
		Importance of RCT data
		Important contextualisation of RWE when used in conjunction with larger datasets

[a]Analysed by content analysis.
[b]Analysed by thematic analysis.

Scottish Cancer Services, however, where data generated by CMOP has been used, the evidence has contributed positively towards patient care. As awareness of CMOP grows nationally, it is hoped CMOP data will be utilised more commonly in routine practice. The results of this study may be of interest to other groups developing RWE, across the UK and internationally, on how their results may be applied in practice.

Conclusion: RWE is a moderately utilised source of evidence in cancer care in Scotland and clinicians believe it adds value to patient-centred care. Initiatives to generate RWE, through programmes like CMOP, can lead to more informed decision-making for clinicians and patients.

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Abstract 22
Type: Poster
Category: Research

Comparison of three frailty scoring tools in multiple myeloma patients

Hannah Miller, Jessica Thompson, Simon White, Roxy Spencer, Emma Witham and Faye Sharpley

Introduction: Multiple myeloma (MM) is a plasma cell malignancy accounting for 15% of haematological cancers, with the highest prevalence in elderly patients and a rising incidence due to the ageing population.[1] Frail MM patients experience more adverse drug reactions, requiring reduced treatment intensity for those deemed frail,[2] which offers potential for frailty scoring tools to guide treatment decisions. Two MM-specific frailty scoring tools exist the International Myeloma Working Group (IWMG) tool[2] and the Myeloma Risk Profile (MRP).[3] There is also the Rockwood Clinical Frailty Scale (RCFS),[4] although this is not MM-specific. These tools are not usually used in routine clinical practice for MM patients, and they score frailty in different ways, so it is unknown whether they would score MM patients similarly or whether the data needed to use them is routinely available.

Aim: To compare the use of three frailty scoring tools (IMWG, MRP and RCFS) in patients with MM on

Table 1. Comparison of frailty scoring between the IMWH, MRP and RCFS tools.

		Frailty scoring breakdown				
Score similarity between tools	Consensus between tools	Fit	Intermediate	Frail	Subtotal	Total
All same score	All	3	0	0	7	8 (35%)
		0	0	3	1	
Two with the same score	IMWG & MRP	1	2	0	2	9 (39%)
		0	1	2	1	
	IMWG & RCFS	0	1	2	2	
	MRP & RCFS	2	1	0	1	
		0	2	1	3	
All different	None	1	1	1	6	6 (26%)
Totals					23	

active treatment and assess their usability in routine clinical practice.

Methods: Following an institutional favourable ethical opinion, patients with MM on active treatment that attended a haematology clinic between 07 March 22 and 15 April 2022 were identified: The Trust's Patient Flow system determined the clinic list and the iQemo electronic-prescribing system ascertained those on active treatment. Patients' demographic and disease-related information were collected for scoring with each tool. This included: age, Charlson comorbidity index, activities of daily living, performance status, ISS score and CRP. The data was collected by the haematology team, following training on the use of the tools for scoring consistency. The IMWG and MRP tools score patients as either 'fit', 'intermediate' or 'frail', but the RCFS scale is from 1 to 9 (1 being fit, 9 being terminally ill), so for comparison, patients scoring 1 to 3 were deemed 'fit', 4 to 5 as 'intermediate' and 6 to 9 as 'frail'.

Results: Thirty-three patients were included in the study. The IMWG and RCFS were calculated in 33 patients (100%), but the MRP score was only calculated in 23 patients (70%), as the beta-2-microglobulin data was missing for 10 patients (30%). Table 1 summarises the scores for the 23 patients for whom all three scores were calculated. Where patients were scored the same by two tools, this included 'intermediate' and 'fit' or 'intermediate' and 'frail', but not 'fit' and 'frail'.

Discussion: The findings suggest low-scoring consistency between these three tools. The IMWG and RCFS appear usable in clinical practice as all data was easily accessible, but the MRP may not be suitable for routine use due to missing data. The differences between the RCFS scores and the other tool scores may be due to its pictorial approach, which does not use demographic or clinical data. However, it is more difficult to explain the inconsistencies between both IMWG and MRP as both are MM-specific tools that consider patient and disease factors. Limitations of this study included the small sample size. Further work is needed to determine the reasons for scoring differences and the significance of this for clinical practice.

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Abstract 23
Type: Poster
Category: Research

Glucarpidase – UK case series; Is there an association between high BMI and methotrexate toxicity?

Elizabeth Davies, Catherine Loughran, David Kaye, Pinkie Chambers, Katrina Rodgers, Hector Mateo-Carrasco, Kavita Kantilal, Ritti Desai, Krystina West, Aoife Tobin, Tiffany Chan, Alex Davies, Jarrod Dunn, Daniel Dutton, Leanne Elder, Ala Elkhatib, Libby Hardy, Ruth Henderson, Onyinye Ndefo, Emma Nicholls, Claire O'Neill, Sarah Scargill, Grace Warrington and Sharon Watts

Introduction: HDMTX (dose > 1 g/m^2) is used commonly as a treatment for high-grade lymphomas, ALL and sarcomas. Glucarpidase is available for urgent treatment of MTX-induced renal dysfunction, in patients with toxic plasma MTX levels, at risk of life-threatening complications. Pharmacist peer discussion nationally, highlighted a recent requirement for glucarpidase in overweight adult patients, prompting this study.

Aims and objectives: Primary objective: To investigate associations between high BMI and requirement for glucarpidase, a proxy measure for severe toxicity.

Secondary objective: to examine national variation in glucarpidase dosing in patients with raised BMI.

Methodology: We developed two cohorts to achieve our objectives:

Cohort 1. Retrospective review of UK adult patients receiving glucarpidase between 01 January 2019 and 01 July 2021, identified via UK sales. A data collection form was developed and piloted, and hospitals having placed orders were invited to participate. Patient baseline demographics, clinical characteristics, MTX regimen/dose and interacting medicines were collated. The glucarpidase dose calculation method and toxicity outcome were recorded.

Cohort 2: A control group from three participating centres of all patients that received HDMTX, not requiring glucarpidase, during the same period.

BMI was categorised according to WHO definitions for overweight and obesity; we described the % of patients in each category and BMI distributions. BMIs across the two cohorts were compared using an unpaired *t*-test.

Results: 23/24 Adult Treatment Centres completed data collection on 34 patients – 32 patients received glucarpidase, and two orders were not administered.

In the control group (N = 209), 61% had BMI > 25 kg/m^2, and 23% had BMI > 30 kg/m^2 compared to 85% and 59% in the glucarpidase group respectively (p = < 0.0001). The BMI average of the control group was 26.9 kg/m^2, compared to 31.6 kg/m^2 in the glucarpidase-treated group. 29/32 patients received glucarpidase dosed according to total body weight (TBW), and three patients according to adjusted body weight (ABW40).

Discussion: Full weight-based chemotherapy dosing is recommended practice for treating obese patients with cancer, especially with curative intent.[1] Only four out of 20 patients with BMI ≥ 30 in the glucarpidase cohort did not receive TBW dose methotrexate, when the reason for dose modification was stated as obesity.

There is a known association between obesity and risk of haematological malignancy, particularly DLBCL,[2] however this small case series suggests obese patients are overly represented in the HDMTX UK patient population experiencing the most severe toxicity, proposing a significant association but not causation. One study has shown an association between overweight patients and increased

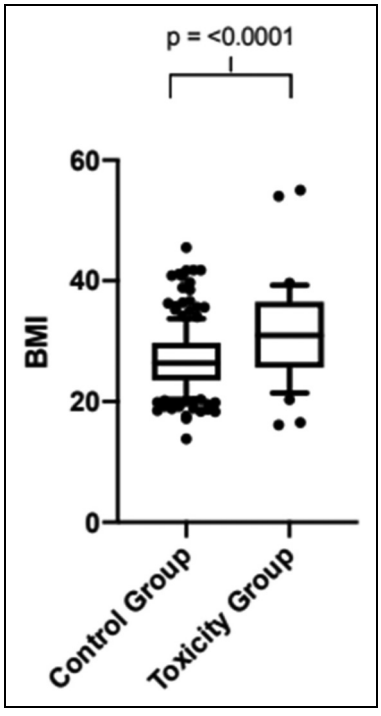

Figure 1. Box and whisker plot showing the difference in BMI of individuals in the control group and the severe toxicity group (requiring glucarpidase treatment).

serum creatinine post-HDMTX,[3] conversely another showed no association between obesity and delayed MTX clearance.[4]

Study limitations and areas of further investigation: Further work is required, using a larger dataset, to determine if obesity is an independent risk factor for MTX-induced renal dysfunction and delayed clearance. Study outcomes are complicated by the fact the precise indication for glucarpidase is ambiguous.

In our study, all three patients receiving glucarpidase dosed according to ABW40 successfully cleared methotrexate, a renal function returning to baseline, supported by published literature on the use of lower doses[5] – an approach which may reduce treatment costs. Larger patient numbers are required to further investigate the optimal dose.

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Abstract 24
Type: Poster
Category: Research

Overcome daratumumab's severe life-threatening reaction by desensitization in relapsed multiple myeloma: A case report

Trang NL, Truc P, Yi HG, Mai VT, Tuan ND and Dinh NV

Introduction: Multiple myeloma has evolved markedly but the mortality remains high. Daratumumab, a monoclonal antibody directly against CD38 antigen on the myeloma cells, has been widely used in relapsed patients, both through monotherapy and combination therapy. However, daratumumab has faced up with the big challenge of the high rate of infusion-related reaction in the first dose at 38%. Less than 3% of patients experienced from grade 3 and above. Despite strict instructions on infusion rate and dilution volume, some severe reactions still occur, leading to the proposed solution to overcome this issue.

Material and method: A 60-year-old man, diagnosed with multiple myeloma (IgD, lambda), achieved very good partial remission (VGPR) with VTD (bortezomib, thalidomide and dexamethasone) and relapsed after 1 year and a half. He was admitted with symptomatic spinal cord compression. Bone marrow studies show 70% of plasma cells in the bone marrow. Whole body CT scan has multiple bones lytic. Emergency irradiation concurrent with daratumumab (total dose of 900 mg) combined with bortezomib, and dexamethasone (DVd regimen) was given. Pre-medications included 20 mg dexamethasone IV, 10 mg diphenhydramine IV and 1 g oral paracetamol administered within 60 min before daratumumab infusion. After 60 min of initial administration from 50 mL/h, at a rate of 100 mL/h, the patient developed sweat, and abdominal cramps, followed by cold extremities, severe dyspnea, then lowered blood pressure (80/50 mmHg) and hypoxia quickly appeared (SpO_2 of 87%).

Results and discussion: Daratumumab was immediately stopped, and adrenaline, methylprednisolone, and diphenhydramine were added. The patient was transferred to ICU with suspected grade 3 anaphylaxis. The patient condition was then stable with supportive care after several days in ICU. No tryptase levels were measured. Unfortunately, symptomatic spinal cord compression progressed remarkably with bladder and bowel incontinence, weakness, and numbness in both legs; this raised a consideration to rechallenge with the daratumumab-based regimen. Patients were conducted daratumumab prick and intradermal skin tests in three concentrations of 0.2, 2 and 20 mg/mL with the negative results by an allergist before desensitization. The first desensitization protocol included four concentrations from 0.005 mg/mL to 0.8 mg/mL with 17 consecutive administration steps in 13.8 h and with the same three pre-medications. In the next cycles, the number of bags and steps gradually reduced to two bags, and nine steps in 4.25 h. The patient was completely tolerated without any reaction over five cycles at the moment and show excellent response. After three cycles, he achieved VGPR and his spinal cord compression disappeared.

Conclusion: Daratumumab has shown a critical role in myeloma treatment. Infusion-related reactions, however, prevent many candidates from using this backbone drug. Desensitization has been a promising solution to overcome daratumumab-related severe infusion reactions, opening a new approach for clinicians. However, to ensure success, it is important to have a multidisciplinary team with an experienced allergists, a haematologist, an ICU team and an oncology pharmacist to create a safe environment for rechallenging.

Abstract 25
Type: Poster
Category: Research

Changes in breast cancer patients' weight with adjuvant palbociclib treatment – A retrospective review

Dr Andy Gitsham, Abby Rainsley, Dr Alice McCloskey, Dr Kate Shemilt and Jennifer Gibson

Introduction: Palbociclib, a CDK4/6 selective inhibitor first approved in 2016, is potentially the most efficacious, adjuvant treatment for hormone receptor-positive (HR+) and human epidemic growth factor 2 (HER2−) in advanced BC (breast cancer). Data are limited regarding its long-term efficacy in overweight or obese patients. These individuals are already at higher risk of cancer due to elevated oestrogen levels, hyperactivation of adipokines and poor oxidative stress regulation. There is also evidence for a higher risk of BC recurrence and obesity-related mortality during palbociclib treatment, thus variations in patient weight during treatment warrant investigation.

Aims: To retrospectively review BC patients' weight variation during palbociclib treatment and explore addressing any clinically significant outcomes.

Objectives: Review trends in body mass index (BMI) during treatment and suggest future pharmacological/lifestyle interventions for patients and increase the chances of progression-free survival (PFS). Perform statistical analysis via Minitab 17 Statistical Software, displaying descriptive/regression statistics per BMI category for 33 cycles (long-term data).

Methods: NHS Foundation Trust X provided raw data (N = 89) to audit weight variation in postmenopausal women receiving palbociclib as part of their first-line adjuvant treatment for advanced HR+ and HER2- BC who had completed 33 cycles (January 2018 – October 2021). Microsoft Excel processed/illustrated the findings (N = 72 were deemed eligible for inclusion) and Minitab was used for statistical analyses between the baseline and final BMI reading. Statistical analysis was conducted using the 2-sample *t*-test to determine the *p*-value to review if palbociclib-associated weight variation was statistically significant.

Results: Pre-treatment 22% of patients (N = 16) had a BMI's classed as healthy, 46% (N = 33) overweight and 32% (N = 23) obese. Post-treatment clinically significant weight variation was evident with 7% (N = 5) of patients previously deemed healthy, 49% (N = 35) overweight *p*: 0.001 and 44% (N = 32) obese. Many palbociclib-treated patients are overweight/obese post-treatment, thus at higher risk of HR+/HER2− BC recurrence and mortality. Pooled long-term data illustrates the weight progression in 2–3 years of treatment and represents clinically significant weight variation in healthy and overweight BC patients.

Discussion/conclusions: The findings suggest, fewer patients are a healthy weight following palbociclib treatment. This poses greater challenges in patient care and disease management with regard to obesity in advanced BC patients. Centred on these challenges, further investigations are warranted to assess the effective treatment and prophylaxis mechanisms needed to successfully target weight gain during BC treatment in overweight/obese patients with palbociclib. These could include providing support with smoking cessation, maintaining a healthy diet, promoting weight loss and reducing alcohol intake and ensuring this is within recommended limits.

Abstract 26
Type: Poster
Category: Research

Changes in breast cancer patients' weight with adjuvant Goserelin treatment – A retrospective review

A Gitsham, Lucy Mack, K Shemilt, A McCloskey and J Gibson

Introduction: Breast cancer in patients who are premenopausal is rare when compared to diagnosis post-menopause. A multidisciplinary management approach is taken for each patient, and their treatment plan is very specific to the cancer type. Treatment can result in various side effects such as weight fluctuation which is commonly listed. Theoretically, weight change is associated with an increased risk of developing cancer, as well as the patient having a relapse, therefore close attention must be paid by the cancer specialist team to counsel patients who are most likely at risk. Multiple factors such as

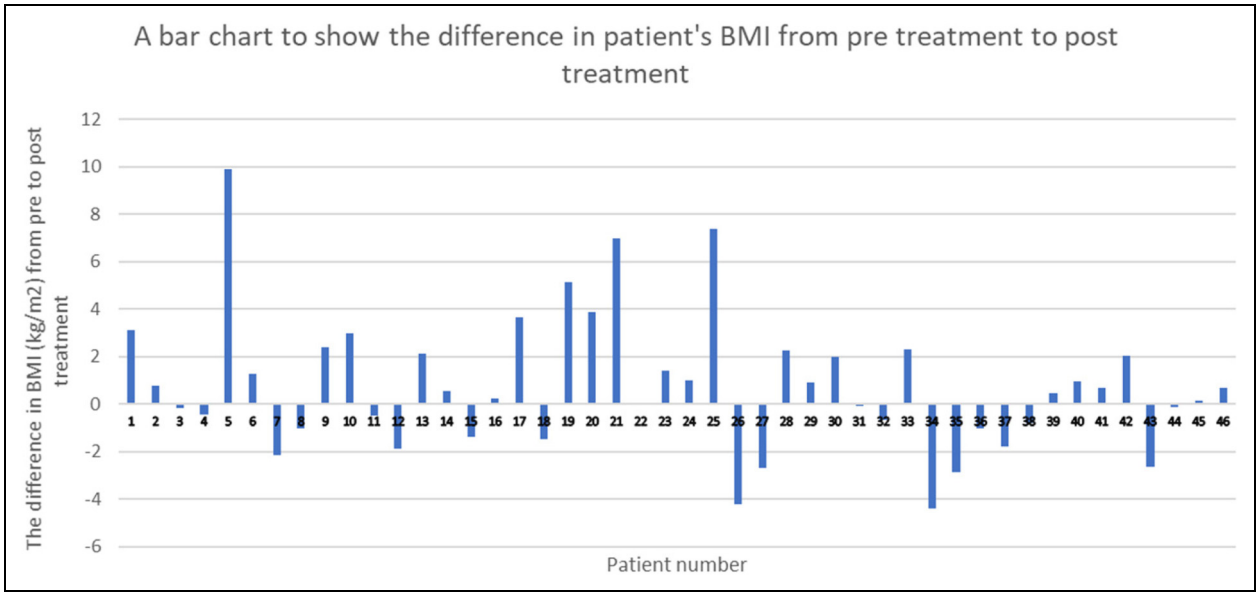

Figure 1. A bar chart to show the difference in body mass index (BMI) from pre to post-treatment with Goserelin within 46 patients.

patient categoric BMI at baseline, comorbidities, adjuvant therapy, and age influence a patient's weight and any significant decrease or increase in this.

Objectives: To investigate whether there is a significant change in both premenopausal and perimenopausal women patients' weight undergoing Goserelin treatment over the course of 36 cycles of treatment.

Method: NHS Foundation Trust X provided raw data (N = 46) to audit weight variation in postmenopausal women receiving Goserelin as part of their first-line adjuvant treatment for advanced ER+ who had completed 36 cycles (January 2018 – October 2021).

The cohort of 46 patients was categorised into three body mass index (BMI) groups: healthy, obese and overweight, and the patient's weight from pre to post-36 cycles of Goserelin treatment was analysed and statistical change was calculated.

Discussion: Initial findings suggested there was a huge variation in weight as the patient's treatment progressed – this was either a weight gain (53% of patients) or a weight loss (47% of patients) as illustrated in Figure 1. When the statistical analysis was applied, however, there was no statistically significant relationship between BMI on commencing treatment and that at the end of 36 cycles of treatment.

Conclusion: Weight is a well-documented risk factor in the development of cancer and in the successful treatment of cancers generally. Whilst this study did not show a statistically significant relationship between weight gain and treatment, further investigation is still warranted with a larger cohort size as it remains a major risk factor for poor health and cancer presentation or recurrence.[1,2]

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Abstract 27
Type: Poster
Category: Research

Retrospective review of escalated antiemetic use and frequency of nausea and vomiting in breast cancer patients receiving trastuzumab-deruxtecan

Benjamin Thwaites and Rachael Ehikioya

Introduction: Trastuzumab-deruxtecan (T-DXd) is a drug-antibody conjugate that has been available for the

treatment of advanced or metastatic HER2-positive breast cancer following two or more prior anti-HER2-based regimens in the UK via the NHS since May 2021.[1] In the phase 2 trial DESTINY-Breast01 trial,[2] 77.7% of participants experienced nausea of any grade (7.6% grade 3 or above), which based on national and international guidelines,[3] would give a moderate rating for emetogenicity and usual practice would be to include steroids and 5HT3-antagonists for emetic prophylaxis from the start of treatment.

However, based on local experience in the trials, and a desire to avoid over-prescribing in this patient population, the decision was made at The Royal Marsden to start patients with domperidone alone and escalate if required. Over a year later, the aim of this review was to identify the number of patients who required additional antiemetics, or experienced nausea or vomiting, and whether an escalation in the default antiemetics is appropriate.

Method: All patients that had been prescribed T-DXd between 1 April 2021 and 31 May 2022 were identified through a reporting function of the local electronic chemotherapy prescribing system. Each individual record was reviewed manually to identify the treatment start and end date, a number of cycles received, starting antiemetics, any additional antiemetics that were dispensed during the treatment period, and any mention of nausea or vomiting in the notes and letters from clinic appointments.

Results: 44 patients were prescribed T-DXd between 1 April 2021 and 31 May 2022, with 36 of these going on to receive at least one dose. 17 patients were still receiving treatment at the time of this review. The median number of cycles received was 5 (range: 1–21). 45% (n = 16) of patients who started treatment required additional emetics, and 54% (n = 19) experienced either nausea or vomiting of any grade. The most common antiemetic used after domperidone was ondansetron (n = 11).

Conclusion: This review has shown that over half of the patients we have treated with T-DXd experienced some form of nausea or vomiting, and most of these went on to be prescribed additional antiemetics for future cycles. Based on this, it is recommended that our protocols are updated to include a 5HT3 antagonist (such as ondansetron) by default, and a subsequent review is completed in one year's time to determine if further escalation is required. It is worth noting that the rates of nausea and vomiting described here were lower than that of the original phase 2 trial (54% vs. 77% respectively,[2] however the number of patients included here is lower than that of the trial. There are some considerable limitations with this review, as the data collection was carried out manually through a retrospective chart review, clinicians may have omitted to mention nausea in clinic letters, and patients who were prescribed additional antiemetics elsewhere would have not been identified.

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Abstract 28
Type: Poster
Category: Research

Development and validation of a risk score (delay-7) to predict the occurrence of a treatment delay following cycle 1 chemotherapy

Pinkie Chambers, Alkesh Patel, Nick Duncan, Nicola Stoner and Li Wei

Background: On average 20% of patients require a systemic anti-cancer treatment (SACT) delay.[1] The risk of toxicity-related dose delays, with SACT, should be included as part of pre-treatment education and be considered by clinicians upon prescribing chemotherapy. An objective measure of individual risk could influence clinical decisions, such as the escalation of standard supportive care and stratification of some patients, to receive proactive toxicity monitoring.

The understanding of this risk may also support the advanced preparation of treatments for those that have a lower risk of delay.

Data available within hospital systems can support the understanding of risk through the development of a risk score.

In this study, we developed and validated a score to assess the risk of a SACT dose delay of 7 days (delay-7 score).

Objectives: To develop and internally validate a risk score to predict the occurrence of a 7-day dose delay for patients receiving cycle 1 treatments for breast and colorectal cancers and diffuse large b-cell lymphomas. To assess the discrimination and calibration of the model.

Methods: Four hospitals were included in our study, recruited through BOPA. Data were collected for patients aged 18 or over, identified through the chemotherapy prescribing systems at each hospital for the period of 1 January 2013 to 1 January 2018. The first chemotherapy treatment date was used as the index date for entry to the cohort during the study period. The study data was restricted to the following three tumour groups: breast, colorectal and diffuse large B-Cell lymphoma. Data included hospital treatment, age at the start of SACT, gender, ethnicity, body mass index, cancer diagnosis, chemotherapy regimen, colony-stimulating factor use, first cycle dose modifications and baseline blood values. Baseline blood values included neutrophils, platelets, haemoglobin, creatinine and bilirubin.

A risk prediction model was developed using multivariable logistic regression and all analysis methods complied with the Transparent reporting of a multivariable prediction model for individual prognosis or diagnosis (TRIPOD).[2] Shrinkage was used to adjust for over-optimism of predictor effects. For internal validation (of the full models in the development data) we computed the ability of the models to discriminate between those with and without poor outcomes (*c*-statistic), and the agreement between predicted and observed risk (calibration slope).

Results: A total of 4604 patients were included in our study of which 628 (13.6%) incurred a 7-day delay to the second cycle of chemotherapy. Delay-7 showed good discrimination and calibration, with a *c*-statistic of 0.68 [95% confidence interval (CI) 0.66–0.7], following internal validation and calibration-in-the-large of −0.006.

Conclusions: Delay-7 predicts a patient's individualised risk of a treatment-related delay at cycle two of treatment. The score can be used to stratify interventions to reduce the occurrence of treatment-related toxicity. However, to be used in the clinical setting a prospective study should be conducted to ensure the reliability of the score. Nonetheless, we have identified that the score can be useful to support advance preparation in pharmacy aseptic units and a small validation in this setting is planned.

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Abstract 29
Type: Poster
Category: Research

Stratification of patient blood testing pathways through predicting deterioration in renal and hepatic function

Pinkie Chambers, Matthew Watson, Sebastian Masento, Rebecca Buroyne and Noura Al Moubayed

Background: In those receiving cytotoxic chemotherapy, renal and hepatic dysfunction can increase the risk of toxicity and should therefore be monitored. However, only a small proportion of patients will experience a change in these functions (measured through creatinine and bilirubin levels) following a second cycle of treatment [1]. We have previously found that less than 10% of patients will encounter changes to their renal and hepatic function. Furthermore, we found the occurrence of one-grade changes does not change the timing of next treatment or dosing.

Variation exists in hospital policies. Some hospitals would require renal and hepatic function, taken within 7 days, to be assessed by pharmacists before clinical verification, whereas other hospitals would verify based on blood from prior cycles. To support, clinicians, pharmacists and nurses streamline pathways and reduce national variations in practice, we aimed to develop a machine learning model.

The objective of the model was to identify those patients that need closer monitoring of their renal and hepatic function, enabling a safer and more efficient service.

Methods: We used retrospective data, from a large academic hospital, for patients treated with chemotherapy for breast cancer, colorectal cancer and Diffuse-large B-cell lymphoma.

The outcome of interest was any grade change in creatinine or bilirubin among patients included, at any cycle following cycle two. We chose bilirubin as an outcome measure rather than ALT; rises in ALT are common with a number of chemotherapeutic agents and rarely cause clinical concern or reflect dysfunction of the liver. The predictors incorporated into the development model were baseline, cycle one and cycle two blood results, patient demographics and details of treatment.

The data enabled us to train and validate a model to predict the outcomes: unacceptable rises in bilirubin or creatinine. To assess the performance of the model, validation was performed using patient data from an independent hospital, containing the same variables. Using this dataset, we evaluated the sensitivity and specificity of our models.

Results: We identified 1214 patients in total. Of these, 684 were included in the training set and 530 patients in validation. The training set had almost perfect sensitivity and specificity of > 0.95. The area under the curve was 0.99 (95% CI 0.98–1.00) for creatinine and 0.97 (95% CI: 0.95–0.99) for bilirubin. The validation set had good sensitivity (creatinine: 0.60, 95% CI: 0.55–0.64, bilirubin: 0.54, 95% CI: 0.52–0.56), and specificity (creatinine 0.98, 95% CI: 0.96–0.99, bilirubin 0.90, 95% CI: 0.87–0.94) and area under the curve (creatinine: 0.76, 95% CI: 0.70, 0.82, bilirubin 0.72, 95% CI: 0.68–0.76).

Conclusion: We have demonstrated that a multi-layer perceptron model can be used within electronic prescribing systems to reduce the number of blood tests required for some patients and improve safety for others. Our study needs further validation and we have been awarded innovative UK funding to both validate the work and develop software that can be used by all hospitals in the UK, to redesign their pathways.

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Abstract 30
Type: Poster
Category: Research

Investigating adherence to tyrosine kinase inhibitors in patients with renal cancer

Fiona Angus, Yubo Wang, Alex Rigg and Li-Chia Chen

Background: Renal cell carcinoma (RCC) is the seventh most common cancer in the United Kingdom. Around 13,300 cases are diagnosed in the UK each year,[1] with roughly 25% diagnosed at the metastasis stage. Tyrosine kinase inhibitors (TKIs), a targeted therapy, are the first-line treatment for many patients with advanced RCC. Optimal adherence to TKIs is crucial for better survival outcomes.[5]. However, adverse effects, such as hypertension, diarrhoea and fatigue,[2] can reduce patients' adherence to TKIs, even using supportive medicines to mitigate them. Medicine dispensing records may monitor adherence to TKIs and identify medication use problems.

Objectives: This research aimed to measure the medication possession ratio (MPR) of TKIs, as a proxy of adherence, in patients with advanced RCC and explore factors associated with suboptimal adherence.

Method: This retrospective cohort study was conducted at a specialist oncology tertiary hospital using the hospital dispensing data. Patients with advanced RCC dispensed TKIs between March 2020 and September 2021 were identified from the cyclical dispensing scheme. Information on patients (gender, year of birth) and dispensed prescriptions (name of TKI, dose and duration) was collected using the JAC dispensing system. Each patient was followed from the date of the first to the final TKI prescription filled. The medication possession ratio (MPR) was derived by dividing the sum of days' supply dispensed by the number of days during the follow-up. It was assumed that all TKIs dispensed were taken. Linear regression models were used to associate the MPR with factors, including age (year), gender (female vs male), type of TKIs (tivozanib, sunitinib, pazopanib, axitinib and lenvatinib compared with cabozantinib) and the length of time since first TKI prescription dispensed. This study did not require ethics approval.

Results: During the study period, 2225 prescriptions were dispensed to 109 patients with a median age of 68. Of the 109 patients, 64.8% (n = 51) were aged over 70 and 66% were males. Most patients were prescribed cabozantinib (n = 48), and 37 of the 109 patients had their dose reduced during the follow-up period. Of all factors included in the regression model, the use of sunitinib (coefficient: −0.0368406; 95% confident interval: −0.0708782, −0.002803; $p = 0.034$) and the length of time since the first TKI prescription dispensed (coefficient: 0.000119; 95% confident interval: 0.0000916, 0.0001463; $p < 0.001$) were significantly associated with MPR (R^2 0.4673).

Discussion and conclusion: In line with previous literature,[3,4] this single-centre study found that patients with advanced RCC generally adhere to TKIs with an MPR greater than 90%, assuming all TKIs dispensed were taken by patients. The type of TKIs and follow-up duration are closely associated with adherence. Most suboptimal adherence occurred in the first 12 months after initiation of TKIs. Therefore, adherence monitoring and mitigation

measures to improve adherence should focus on the first 12 months of initiating TKIs. Further large-scale studies are required to comprehensively investigate other factors associated with adherence to TKIs and develop interventions to improve adherence and medication use problems.

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Abstract 31
Type: Poster
Category: Research

Evaluation of a smartphone app (My CML) to support patients with chronic myeloid leukaemia: the Patient perspective

Nick Duncan, Zahraa Jalal, Jennifer Jupp, Sam Spurgeon and Andrea Preston

Introduction: In the past decade there has been a marked increase in the availability of healthcare apps to support patients with medical conditions, including cancer.[1] Following an earlier investigation of the potential role of apps to support patients with chronic myeloid leukaemia (CML),[2] we developed a patient app (My CML) that launched in March 2022. We then undertook a post-launch evaluation of the app from both healthcare professional and patient perspectives. The specific objectives of this part of the evaluation were to determine levels of uptake and engagement with the app amongst patients and to assess their attitudes towards the usability of the app in relation to the following 3 domains: ease of use; interface and satisfaction; usefulness.

Methods: Google Analytics (https://analytics.google.com) was employed to collect usage data for the first 4 months post-launch. Data fields included numbers of users and geographical location, time spent on the app and usage breakdown by specific function. An online survey based on a validated health app usability questionnaire (MAUQ)[3] was prepared and publicised to CML patients via three international CML support groups and also on the app itself. The MAUQ contained 18 statements divided into three domains (see introduction) that participants scored on a scale of 1 (*strongly disagree*) through to 7 (*strongly agree*). Usability (on a scale of 1–7) was determined by calculating the average of the responses to all 18 statements. The survey was open for 1 month in May-June 2022.

Results: 808 users were recorded in the first 4 months post-launch. The app was downloaded by patients in 65 different countries: the majority (59%) were from the UK. The average engagement time was 10 min 47 s and the most popular app functions were the My Progress and Drug Interaction Checker functions. Survey responses were received from 44 patients. 61% were female, 64% were residents of the UK, and 80% had been diagnosed in the past 5 years. 82% of respondents were still using the app at the time of completing the survey and the majority of these (53%) used the app every day. The overall mean usability score amongst all respondents was 5.8 (95% confidence interval (CI) 5.5–6.1). Results for the three subdomains and for subgroups are presented in Table 1.

Table 1. MAUQ scores for questionnaire respondents.

	Mean MAUQ score (Scale of 1–7)				
Category	Ease of use	Interface and satisfaction	Usefulness	Overall usability	
All patients (n = 44)	6.0	6.0	5.4	**5.8**	
Still using app (n = 36)	6.2	6.3	5.6	**6.0**	$p = 0.0007$ (unpaired *t*-test)
Stopped using app (n = 8)	4.8	4.6	4.6	**4.7**	
Apple users (n = 21)	6.3	6.2	5.5	**6.0**	$p = 0.15$ (unpaired *t*-test)
Android users (n = 23)	5.7	5.7	5.4	**5.6**	

Discussion and conclusions: The app achieved high download levels and excellent geographical reach within 4 months of launch. Usability scores from respondents were generally high although there was a degree of variation in scores for the three subdomains. It was unsurprising that respondents who had stopped using the app scored its usability as being significantly lower than current users and it was noteworthy that there was a trend in favour of increased usability amongst iPhone users compared with Android users. One weakness of the study was the relatively low response rate although it is planned to strengthen the overall evaluation through the use of focus groups and interviews. Combined data from all parts of the evaluation will be used to further develop and improve the app.

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Abstract 32
Type: Poster
Category: Research

Barriers to and drivers of adherence to oral therapies in patients with multiple myeloma: the ATOMM study

Nick Duncan, Lina Eliasson, Christine Hirsch, Guy Pratt and Anthony Cox

Introduction: Estimated rates of non-adherence to medicines for long-term conditions may be as high as 50%.[1] Currently, little published information on adherence to oral therapies for multiple myeloma exists. However, complex treatment schedules, and patient demographics, make sub-optimal adherence possible. We undertook a mixed-methods adherence study (The ATOMM study: IRAS 258091)) utilising a combination of validated questionnaires and focus groups. We report on the focus group component of the study, the aims of which were to explore behaviour, values and views associated with adherence to oral therapies and potential strategies to improve adherence.

Methods: Participants were recruited through the myeloma clinic in a UK tertiary referral centre. Three remote focus groups were undertaken: two patient groups, each composed of four patients, and one health care professional (HCP) group, composed of two myeloma physicians, a clinical nurse specialist and a pharmacist independent prescriber. Two members of the study team facilitated the groups, working from a discussion guide. Focus groups were recorded and transcribed verbatim. One of the facilitators reviewed the transcripts for accuracy and transcripts were anonymised prior to analysis. A thematic framework analysis[2] was then undertaken. Coding and themes were developed and consensus was reached amongst the three study team members responsible for the analysis.

Results: Qualitative analysis identified seven interconnected themes (see Figure 1). Side effects emerged as a key theme, with patients raising the importance of being able to negotiate doses and schedules with their HCP as a way of allowing them to feel in control of their medication taking. Information provision was also highlighted by all participants: patients were concerned about the complexity and detail within package inserts and expressed a need for simpler, more targeted, provision of medicines-related information. Similarly, HCPs felt that patients were at risk of information overload due to the complexity of the disease and its treatment. "Drip-feeding" information and focusing on key points were provided as potential solutions. Inconsistent findings were found on the impact of time since diagnosis and the number of previous lines of therapy on adherence behaviours: whilst it was noted that familiarity with medication could encourage improved adherence, concern was raised that motivation for treatment may wane over time and poorer physical health may also have a negative effect. Strategies to improve adherence included patient diaries/reminder charts, better communication between the clinical team and patients, technological support (apps, phone reminders), and pill organisers. Support networks (e.g. engaging family members, and joining myeloma support groups) were also identified as potentially beneficial tools by both patients and HCPs.

Discussion and conclusions: Side effects, the complexity of treatment and knowledge gaps all emerged as clear barriers to adherence in myeloma patients. A variety of strategies (focusing on information provision, enhanced patient-to-patient and patient-to-HCP communication and physical inputs) were suggested as ways of improving adherence and might inform interventions to enhance adherence behaviours in this patient population.

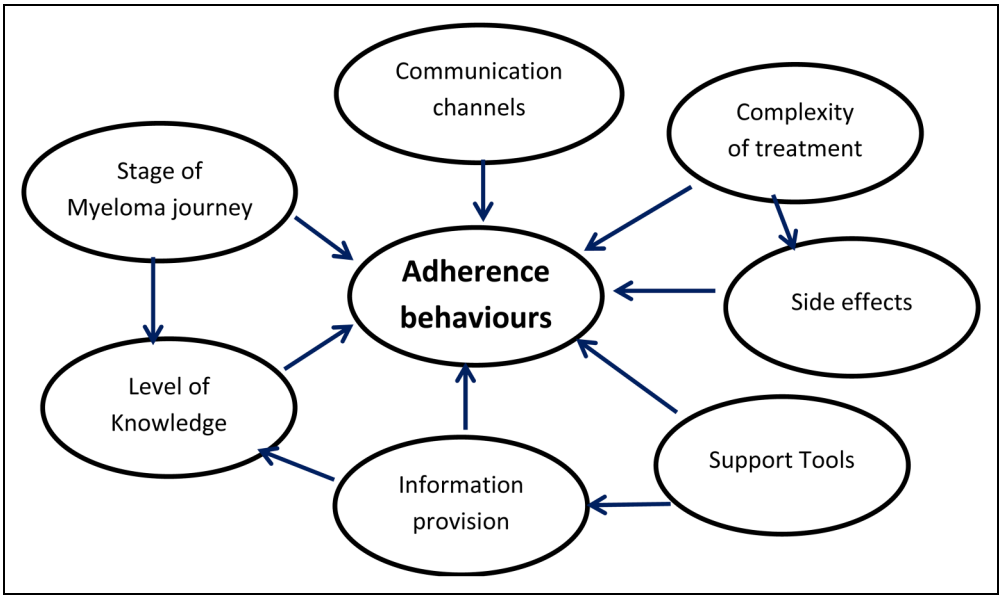

Figure 1. Focus group themes.

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Abstract 33
Type: Poster
Category: Research

Investigating the experience and the usage of remote consultations by UK pharmacy professionals

Mariachiara D'Elia, Dr Shereen Nabhani-Gebara and Miss Melanie Dalby

Background: The 2019 coronavirus pandemic (COVID-19) has revolutionized and, in some ways, enhanced and encouraged the use of technology. Preventing contagion, especially for cancer patients, pushed pharmacy professionals (PPs) to conduct virtual routine consultations for reviewing medications aiming to provide immediate care without delays in treatments. This was proven to be a convenient alternative to face-to-face consultations as demonstrated by Marchese et al.[1]

Objectives: The objectives of this research were to evaluate the usage, advantages and disadvantages of remote consultations (RC) and the improvements needed to encourage its future usage by PP.

Method: This cross-sectional study involved PP based in primary and secondary care who used RC. Favourable research ethical approval was received by the Pharmacy department of Kingston University London on 29 January 2022.

Ninety-one participants were successfully recruited from UK pharmacy associations, mostly from the British Oncology Pharmacy Association, and were asked to complete a 10-min survey on Microsoft forms. Quantitative and qualitative data analyses were conducted through SPSS and NVivo software.

Results: 79% of PP used RC, of which 57% used only telephone and 43% a mix of telephone and video consultations. The most undertaken services were counselling, prescribing, responding to symptoms, and monitoring.

In our study participants reported that RC can create social inequalities for people that cannot access or use technology or people with hearing and speaking difficulties. Furthermore, they stated that better IT infrastructure was needed to support RC: larger screens, smarter and simpler technology, connected infrastructure to bring patients face to face in a timely manner, more IT support to patients, video calling software that is fit for purpose, dedicated spaces to conduct RC and the provision of electronic devices to staff and patients if needed.

78% were satisfied with RC and the majority of PP are inclined on using this technology in the future.

Discussion: This research is the first in the United Kingdom to examine the perspective and experience of PP with RC. Previous studies focused on the perspective of pharmacists rather than the pharmacy staff as a whole, while others were published prior to the COVID-19 outbreak and thus are anachronistic with respect to our objectives and the recent pandemic.

The advantages and disadvantages of RC found in our study are not dissimilar to those of previous studies in aspects such as cost and time effectiveness, limitations to physical assessment,[2] communication errors.[3]

Data regarding social inequalities and better IT infrastructure should be further analysed to identify how these challenges can be overcome to provide a better quality of care.

This study has three main limitations:

1. A low number of participants due to time and resources available.
2. The disparity between hospital pharmacists compared to the rest of pharmacy professionals.
3. The author's lack of experience manifests naiveté in the design of some questions.

Conclusion: The experience with RC was positive and undoubtedly necessary, bringing benefits and challenges. Our study represents a starting point for exploring how to improve IT infrastructures and social inequalities to enhance patients' care with RC.

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Abstract 34
Type: Poster
Category: Research

Describing systemic anti-cancer therapy pathways in metastatic colorectal cancer patients using real-world data

Haya Yasin, Amanj Kurdi, Tanja Mueller, Julie Clarke, Kelly Baillie, Janet Graham and Marion Bennie

Background: The rapid uptake of new medicines for metastatic colorectal cancer (mCRC), together with the wide range of potential combinations and sequences available for treating mCRC, presents challenges for clinicians in deciding the optimal treatment plan for their patients. Published studies describing treatment pathways for mCRC in routine practice are scarce, mainly due to the complexity of the clinical pathways that depend on a combination of patients' characteristics, tumour clinicopathological characteristics, and previous treatment outcomes. This study aims to illustrate the variation in treatment pathways in mCRC patients in NHS Greater Glasgow and Clyde (NHS GGC).

Methods: National and local Scottish datasets, including the chemotherapy electronic prescribing and administration system (CEPAS), the Scottish Cancer Registry, and the national records of Scotland, were linked retrospectively using the Scottish community health index (CHI) number as a common identifier. Data for adult patients diagnosed with mCRC and who received at least one mCRC systemic anti-cancer treatment (SACT) in NHS GGC from 01 January 2015 to 31 December 2016 were used to develop a Sankey plot in R studio to illustrate the treatment pathways. Patients were followed up until death, loss to follow-up or end of the study on 28 February 2018, whichever occurred first.

Results: A total of 277 patients were identified; 220 (79.4%) patients had no prior mCRC SACT before the study period. The initial SACT in the study for most patients was a doublet of either FOLFOX (n = 60, 21.7%), CAPOX (n = 26, 9.3%) or FOLFIRI (n = 6, 22.4%), whilst 54 (18.8%) patients received 5-fluorouracil monotherapy, and 75 (26.1%) patients received triplet therapy of cetuximab + FOLFIRI or aflibercept + FOLFIRI. Overall, 39 unique SACT pathways were

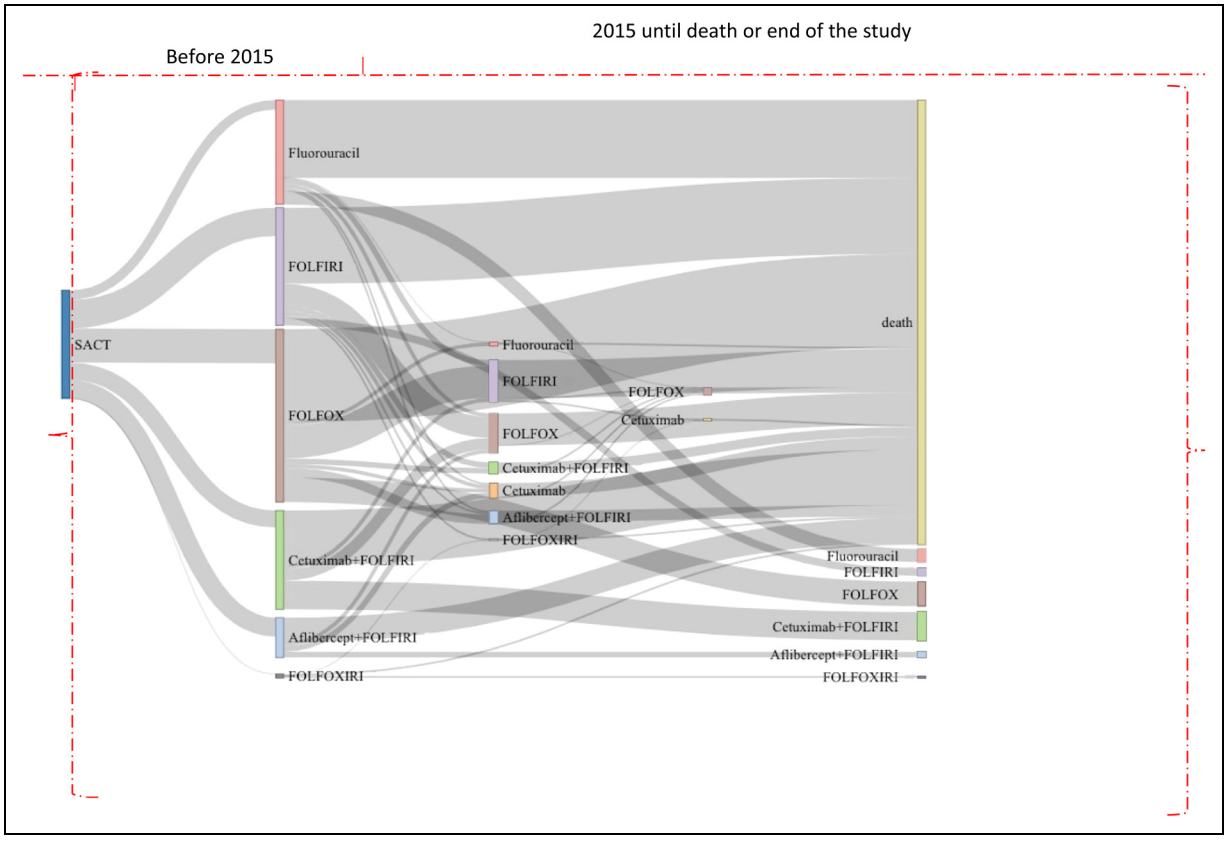

Figure 1. Sankey plot illustrating treatment pathways for metastatic colorectal cancer patients treated in NHS Greater Glasgow and Clyde (N=277).
SACT: systemic anti-cancer therapy; FOLFOX: 5-fluorouracil+oxaliplatin; FOLFIRI: 5-fluorouracil+irinotecan; FOLFOXIRI: 5-fluorouracil+oxaliplatin+irinotecan.

identified, as shown in Figure 1. 209 (75.5%) patients received only one line of SACT, and 68 (24.5%) patients received at least two different lines of SACT during the study. Of these, 18 (26.5%) patients had their initial SACT downgraded from a triplet to a doublet or from a doublet to monotherapy, whereas 19 (27.9%) patients had their initial SACT upgraded from monotherapy to a doublet or from a doublet to triplet. Only six patients received three distinctive treatment lines during the study timeframe. The median duration for the first SACT treatment was 112 days (IQR: 57–167 days), whereas the median time from the first SACT to the second line of SACT was 222.5 days (IQR: 98–319 days). And the median time from the end of the first SACT and the beginning of the second SACT was 80 days (IQR: 21–163 days).

Conclusion: Visualisation tools such as the Sankey plot can describe the complex treatment pathways in routine practice. Although Sankey plots need careful interpretation, healthcare professionals can utilise them to improve the delivery of personalised cancer care.

Abstract 35
Type: Poster
Category: Research

Comparative effectiveness and safety of first-line systemic anti-cancer treatments of metastatic colorectal cancer: A systematic review and meta-analysis

Haya Yasin, Amanj Kurdi, Fatema Mahmoud, Natalie Weir, Tanja Mueller and Marion Bennie

Background: Metastatic colorectal cancer (mCRC) is characterised by multiple treatment strategies. Randomised clinical trials are not always aligned with the clinical practice, and greater use of real-world (RW) studies has been suggested to inform healthcare decisions by providing results that reflect RW practice. The purpose of this systematic review and meta-analysis was to provide a synthesis of the available RW evidence on the effectiveness and safety of first-line systemic anti-cancer therapies (SACTs) in patients with mCRC.

Methods: Relevant databases were searched from inception until July 2021. Inclusion criteria were observational studies; published in English; patients ≥ 18 years; mCRC; first-line SACT for treatment of mCRC. No restrictions were placed on the country of publication. The effectiveness outcomes included overall survival (OS), the primary outcome, and progression-free survival (PFS). Safety was assessed by the occurrence of grade 3 or 4 adverse effects based on the national cancer institute common terminology criteria for adverse events (NCI CTCAE). The results were synthesised using a random-effect meta-analysis model based on hazard ratio and 95% confidence interval (95% CI) for survival outcomes, while risk ratio and 95% CI was used for safety outcome. Subgroup analysis was performed to explore differences between different treatment strategies. Heterogeneity was assessed using I^2.

Results: The search strategy identified 5662 studies, of which 31 met the inclusion criteria and were included in the overall survival meta-analysis. The pooled hazard ratio for overall survival, including all SACTs, was 1.19 (1.1–1.29). The overall heterogeneity of included studies was 76.6%. Subgroup analysis identified a significant difference between different treatment comparisons ($p = 0.01$). The pooled overall survival was significant for chemotherapy only versus Bevacizumab+ chemotherapy (pooled estimate: 1.15 (1.05–1.26).

For PFS, 20 studies were included in the meta-analysis. The pooled hazard ratio, including all SACTs, was 1.19 (1.08–1.3), with an overall heterogeneity of the included studies was 64.4%. Subgroup analysis showed a significant difference between different comparisons ($p = 0.001$). The pooled PFS was significant for (1) chemotherapy only versus bevacizumab+ chemotherapy (pooled estimate: 1.36 (1.05–1.26) and (2) bevacizumab+ irinotecan-based chemotherapy versus bevacizumab+ oxaliplatin-based chemotherapy (pooled estimate: 1.22 (1.07–1.38).

For the safety outcomes, 14 studies were included in the meta-analysis. The pooled relative risk of haematological and non-haematological toxicities was 1.25 (0.89–1.76) and 1.03 (0.73–1.46), respectively, with no statistically significant difference between different treatment strategies for the haematological toxicities ($p > 0.05$). However, the pooled estimate for non-haematological toxicities was significant for two subgroups (1) bevacizumab+ XELIRI versus bevacizumab+ FOLFIRI (pooled estimate 1.66 (1.03–2.7). and bevacizumab+ FOLFOXIRI versus bevacizumab+ XELOXIRI (pooled estimate: 3.5 (1.9–6.4).

Conclusion: The results indicated a survival benefit for bevacizumab with additional non-haematological toxicities for several combinations involving bevacizumab used in first-line settings of mCRC treatment. Although the survival benefit may appear clinically modest, bevacizumab offers hope for increased survival for patients with mCRC.

Abstract 36
Type: Poster
Category: Research

Can immune-related colitis experienced by patients treated with immune checkpoint inhibitors be accurately identified using electronic healthcare data?

Fionagh Ross, Maree Brennan, Peter Hall, Mark Stares, Julie Clarke, Kelly Baillie, Christine Crearie, Marion Bennie and Jennifer Laskey

Background: Immune checkpoint inhibitors (ICIs) are associated with side effects distinct from those seen in patients treated with cytotoxic systemic anti-cancer therapy (SACT). These immune-related adverse events (irAEs) can: affect any body organ, manifest many months after starting treatment and may require significant healthcare resources in their management.[1] Although irAEs are reported within the pivotal trials, further characterisation in the post-marketing setting will help clinicians better understand how patients tolerate ICIs. The Cancer Medicines Outcomes Programme (CMOP) is currently undertaking a study of the safety and efficacy of ICIs prescribed for patients within NHS Scotland.[2]

Aims and objectives: To determine whether colitis irAEs experienced by patients treated with ICIs can be identified using electronic healthcare data, and define an algorithm for their identification using the CMOP immunotherapy patient cohort.

Methods: A retrospective cohort study using electronic data including Chemocare (SACT prescribing data), primary care prescriptions, ICD10 and OPCS (Classification of Interventions and Procedures) codes from Scottish Morbidity Records. Longhand verification was undertaken using pre-existing local databases of melanoma and lung cancer patients treated with ICI, or individual patient case record review was undertaken. Included patients received ICI within NHS Lothian between January 2014 and December 2020 and were followed up from the start of ICI until 3 months after the last treatment. Patients with admission under ICD10 codes for colitis in the 12 months preceding the start of ICI treatment were excluded.

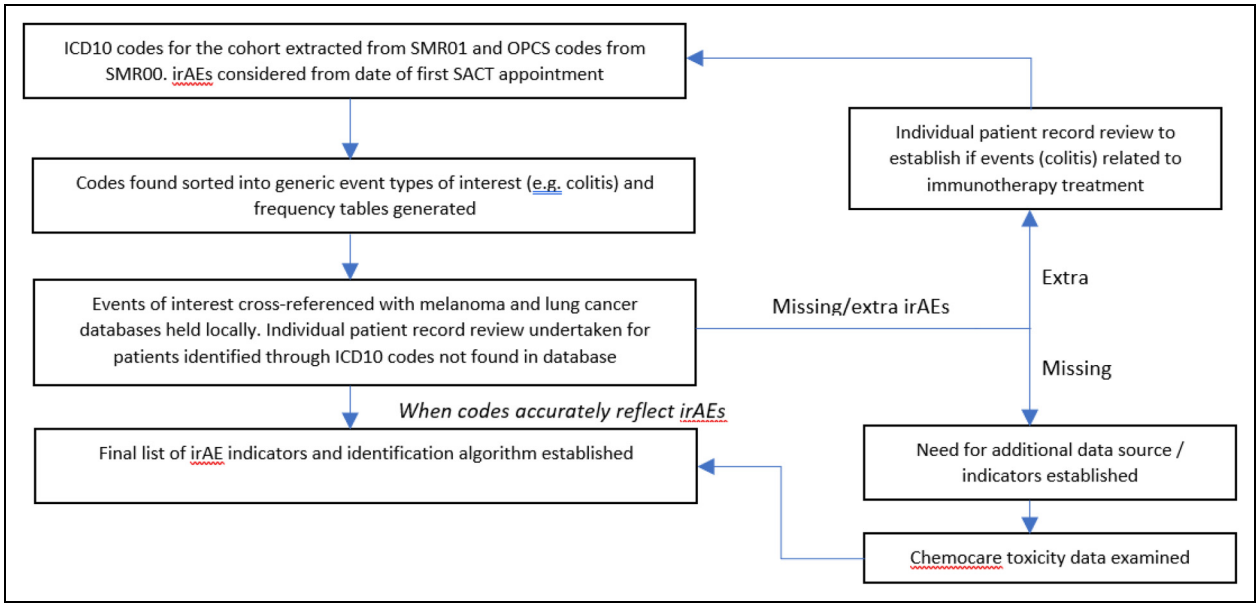

Figure 1. Process of identification and validation of irAEs using ICD10 codes within SMR01.

Results: A total cohort of 507 patients in ICI were identified. 53 patients had at least one acute admission coded as colitis. 34 cases were verified as true immune-related colitis:

- 13/13 patients included in the local database
- 17/40 patients not captured in the database; individual case note review was undertaken.
- 4 patients were captured within the database for whom no ICD10 codes for colitis were found. No OPCS codes for diagnostic colonoscopy were found within SMR01/00 for this cohort.

As 23 cases coded as colitis through ICD10 in SMR01 were found not to be true clinical cases through long-hand verification, data were linked with Chemocare toxicity CTCAE scores to investigate if overlapping datasets improved specificity. 6 (18%) of patients with colitis had maximum diarrhoea CTCAE scores of 2, 14 (41%) scored 1, and 14 (41%) scored 0.

Discussion: The colitis IrAE incidence rate of 6.7% (34/507) in our cohort compares with ESMO guidance of 8%–22% colitis rates in patients with anti-CTLA-4 antibodies and 1%–2% in those on anti-PD-1 antibodies. It may be that clinicians dealing with admission for colitis did not access the Chemocare records of inpatients due to the acute management focus of their treatment at that time.

Conclusion: Within existing datasets, irAEs including colitis experienced by patients on ICI remain difficult to characterise through electronic linkage of records. Colitis identification through ICD10 codes in SMR01 lacked the required specificity. Chemocare version 6 includes a toxicity module that allows the capture of a wider range of SACT toxicities. This may better inform future work in the identification of irAE in patients on immunotherapy.

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Abstract 37
Type: Poster
Category: Research

The influence of body-mass index on survival of advanced melanoma patients

Pedro Fontes, Dr Itamar Megiddo, Dr Tanja Mueller, Julie Clarke, Dr Sarah Barry and Prof Adam Kleczkowski

Objectives: Melanoma is the deadliest form of skin cancer, accounting for 90% of all skin cancer-related deaths globally. Although treatment of advanced melanoma has improved over the last decade, we have limited knowledge about the most effective treatment pathways.[1] During the course of treatment patients may experience changes in therapy or physiology that can influence survival and should be considered in survival models. Incorporating this variability may

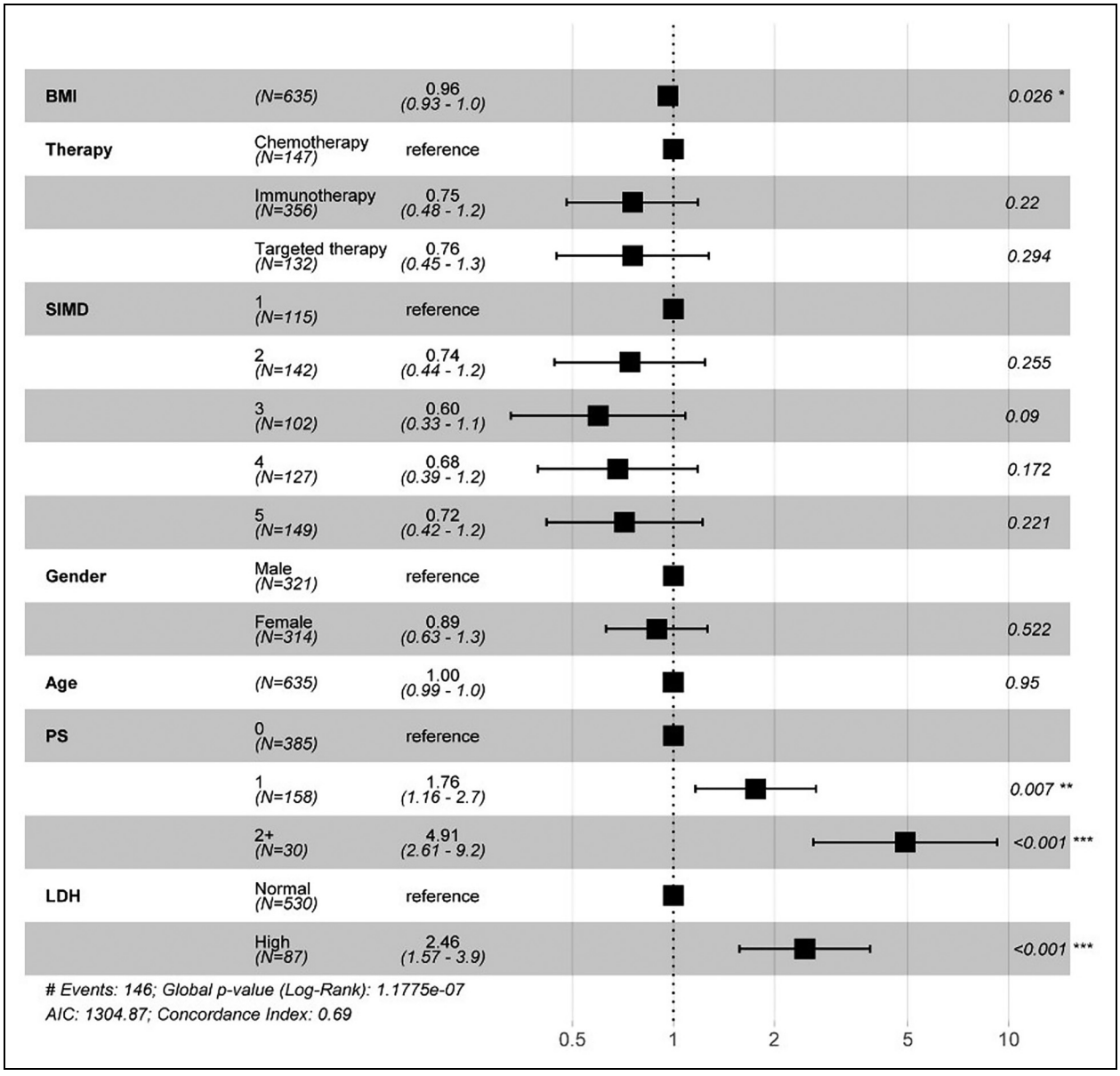

Figure 1. Forest plot of survival model with BMI as a time-dependent covariate.
Note: BMI is included as a time-dependent covariate in a multivariable Cox regression model; Other covariates are time-fixed (baseline); BMI – Body-Mass Index; SIMD – Scottish Index of Multiple Deprivation; PS – ECOG Performance Score; LDH – Lactate dehydrogenase. Chemotherapy includes dacarbazine, temozolomide and paclitaxel + carboplatin; Immunotherapy includes ipilimumab, nivolumab, pembrolizumab and ipilimumab + nivolumab; Targeted therapy includes dabrafenib, dabrafenib + trametinib and vemurafenib.

help better assess the treatment effectiveness in real-world clinical practice for informing treatment decisions.

Survival probability is usually calculated according to information at baseline. The aim of this research is to understand the impact of body-mass index (BMI) changes over time on survival of melanoma. BMI was recorded at most appointments along with other patient information, demographics and laboratory results. BMI was categorised into groups according to the parameters defined by World Health Organization.[2] Thus, survival analysis of these patients according to BMI and BMI changes was studied.

Methods: The study was conducted on a cohort of 350 patients, who had 2784 appointments between 14 March 2008 and 30 March 2018 from NHS Greater Glasgow and Clyde diagnosed with advanced melanoma.

The methods used were Cox proportional hazards models and log-rank tests. The event investigated was survival and the main outcome of interest was the hazard ratio. Multivariable standard Cox regression model and time-dependency adjusted Cox models were fitted to the data to assess survival probability. A log-rank test was performed in these Cox models to assess covariates' statistical significance towards overall survival. A time-dependency-adjusted (TDA) Cox regression model using BMI as a time-dependent covariate was fitted to the data.

Discussion: The TDA Cox model for BMI revealed patients with higher BMI have an increased probability of survival. It found that increases in BMI over time may enhance/improve patient survival. Patients with an increase of 1 unit in BMI (e.g. 29–30 kg/m^2) are 5% more likely to survive in comparison with the previous BMI measured. Recent studies on the impact of BMI at baseline and obesity on survival suggest that in patients with advanced melanoma, obesity is associated with improved outcomes such as progression free-survival and overall survival.[3,4]

The results also showed that ECOG PS Performance Score and LDH levels have a statistically significant impact on survival.

Conclusion: A cancer patient's journey for survival should not be solely determined by baseline information. Along their treatment course, changes in therapeutic or regimen medication dose, variations in laboratory results and/or appearance of adverse events, for example, can influence overall survival. Time-dependency-adjusted Cox models could be more suited to predict survival as these can incorporate changes over time. Thus, further investigation into these models is needed to understand their applicability of these models in a real-world population.

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Abstract 38
Type: Poster
Category: Research

Assessing pharmacogenomic dihydropyrimidine dehydrogenase testing in clinical practice

Dr Anneke Alves, Dr Chloe Caws, Dr Carina Owen, Kate Gregory Rachel Palmer, Dr Stephen Falk, Dr Timothy Robinson, Dr and Thomas Strawson-Smith

Background: Dihydropyrimidine dehydrogenase (DPD) testing is nationally mandated prior to receiving fluoropyrimidine chemotherapy to identify individuals with an inter-individual genetic variation that puts them at an increased risk of severe toxicity.[1,2] This project aimed to assess the implementation of DPD testing and investigate whether testing has reduced toxicity.

Methods: A retrospective search of a prospectively-maintained database identified two cohorts of patients who received fluoropyrimidine chemotherapy (5-fluorouracil or capecitabine) at The Bristol Haematology and Oncology Centre (BHOC); a pre-testing cohort from April to August 2019 and a post-DPD testing cohort from February to May 2021. Patient data were collected using electronic prescribing and noting systems.

Results: In the post-test cohort, 100% (92 patients) had a DPD test with 96% (88 patients) receiving results prior to starting chemotherapy. A DPD variant was identified in 10% (nine patients, all heterozygous) with all doses being appropriately reduced except for one patient where chemotherapy was started prior to the result being available. The mean turnaround time, counted in days from blood draw to result available, was 3 days (range: 1–8). In the pre-DPD cohort, 29% of patients reported diarrhoea in comparison to 40% in the post-testing cohort. In the pre-testing cohort, 7% of patients were admitted to the hospital due to any significant toxicity with a median length of stay (mLOS) of 4.5 days, whereas 10% of the post-testing cohort were admitted with an mLOS of 3 days.

Discussion: Our results have confirmed complete compliance at the BHOC for DPD testing in accordance with the national recommendation. Time to receive a

DPD result is short but we aim to improve the process by moving to electronic requesting and receipt of results. Within this cohort, there was no apparent reduction in toxicity although mLOS was reduced. We plan to combine our data with other local centres to more accurately reflect the impact that testing has had on clinical practice.

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Abstract 39
Type: Poster
Category: Research

Identifying the prevalence of polypharmacy in a cohort of older adults with cancer

Darren J Walsh, Bronagh Bolger, Hitam Ameen, Laura J Sahm, Eimear McGowan, Michelle Hannan, Michelle O'Driscoll and Anne M Horgan

Introduction: Polypharmacy has been shown to be an independent risk factor for adverse outcomes in older adults with cancer.[1] It is therefore important to identify what proportion of this patient population experience polypharmacy (≥ 5 medications) or hyper polypharmacy (≥ 10 medications).

Objective: To identify the prevalence of polypharmacy and hyper polypharmacy in a random cohort of older adults with cancer.

Methods: Using inpatient management software (iPMS), we identified patients aged ≥ 70 years who attended a medical oncology clinic in our institution, between 1 January and 31 March 2018. A retrospective medical chart review was conducted, and the following data were collected: age, gender, primary cancer diagnosis, stage, performance status (ECOG),[2] Charlson Comorbidity Index (CCI),[3] number of medications.

Pseudo-anonymised data was inputted and analysed using Microsoft Excel (IBM Corp.). Descriptive statistics were generated. Ethical approval was granted by the Health Service Executive Southeast Research Ethics Committee.

All patients with a solid tumour diagnosis who attended their clinic appointment and were aged ≥ 70 years were included. Patients who did not attend their clinic appointment were excluded from the study population.

Results: Of 133 patient records evaluated, 35 were excluded due to non-attendance at the clinic (n = 34) and duplicate patient attendance (n = 1). The median patient age was 75 years (70–94), and 61% (n = 60) were female. The most prevalent cancer diagnoses were breast cancer 40% (n = 39) and gastrointestinal cancers 37% (n = 36). Advanced disease (Stage III/IV was present) in 65% (n = 64) of patients. Performance status was good (0–1) in 58% (n = 56) of patients. Comorbidity was mild (CCI ≤ 2) in 22% (n = 22), moderate (CCI 3–4) in 18% (n = 18) and severe (CCI ≤ 5) in 59% (n = 58) of patients. Polypharmacy was observed in 79% (n = 77) and hyper polypharmacy was observed in 36% (n = 35) of patients

Discussion: In our patient cohort of older adults with cancer we found that the prevalence of polypharmacy and hyper polypharmacy was high. This highlights the opportunity for clinical pharmacists specialising in geriatric oncology to perform medication reviews to reduce inappropriate prescribing. A guide to medication reviews for older adults with cancer is available courtesy of the International Society of Geriatric Oncology.[4] This guide is a useful tool to implement medicines optimisation in the geriatric oncology setting.

Pharmacists, as part of the multidisciplinary team, should use their skills to undertake comprehensive geriatric medication reviews in older patients with cancer. This ideally should encompass a full medication history, monitoring of patient adherence, identifying potentially inappropriate medications, drug–drug interactions and where identified – deprescribing medication where the risk-to-benefit ratio may be unfavourable. This approach should reduce adverse events and improve patient outcomes in older patient with cancer.

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Abstract 40
Type: Poster
Category: Research

The incidence of hospitalisation in older adults with cancer due to systemic anti-cancer therapy (SACT) toxicity

Darren J Walsh, Hitam Ameen, Bronagh Bolger, Laura J Sahm, Eimear McGowan, Michelle Hannan, Michelle O'Driscoll and Anne M Horgan

Introduction: Systemic anti-cancer therapy (SACT) toxicity is a challenge for older adults with cancer. To date several tools have been developed to help predict this toxicity at baseline, thereby identifying patients in whom the risk of toxicity may outweigh the benefit of therapy.[1] Our aim was to assess the incidence of hospitalisation due to SACT toxicity and to examine the proportion of these adverse drug events (ADE) that were potentially avoidable.

Objective: Identify the incidence of hospitalisation due to SACT toxicity in older adults with cancer.

Methods: Using inpatient management software (iPMS), we identified patients aged ≥ 70 years who attended the outpatient department (OPD) to attend a medical oncologist clinic in our institution, between 1 January and 31 March 2018. A retrospective medical chart review was conducted, and the following data were collected and pseudo-anonymised: age, gender, diagnosis, Cancer stage, performance status (ECOG),[2] SACT treatment plan, hospitalisation within 6 months of a clinic visit (Y/N) chemotherapy toxicity if hospitalised, potentially avoidable/unavoidable hospitalisation. Microsoft Excel (IBM Corp.) was used for data input and analysis. Descriptive statistics were generated.

All patients with a solid tumour diagnosis who attended their clinic appointment and were aged ≥ 70 years were included. Patients who did not attend their clinic appointment were excluded from the study population.

Results: Of 133 patient records, 35 were excluded due to non-attendance at the clinic (n = 34) or duplication (n = 1). The median age was 75 years, range, of 70–94 and 61% (n = 60) were female. The most prevalent cancer diagnoses were breast cancer 40% (n = 39) and gastrointestinal cancers 37% (n = 36). Advanced disease (Stage III/IV was present) in 65% (n = 64) of patients. Performance status was good (0–1) in 58% (n = 56) of patients. A total of 62% (62) patients received SACT. Almost one-third (33%) of patients were hospitalised within 6 months of attendance. Of these hospitalisations 50% (n = 16) were due to SACT toxicity. Potentially avoidable hospitalisation was found in 19% (n = 3) of patients who experienced SACT toxicity.

Discussion: SACT toxicity remains an important consideration for the oncology multidisciplinary team, accounting for half of all admissions in older adults with cancer.[3] Despite the small sample size and single centre limitations, our results suggest the implementation of comprehensive geriatric medication review[4] by pharmacists may identify patients at risk of SACT toxicity, leading to potentially improved patient outcomes in this cohort.

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Abstract 41
Type: Poster
Category: Research

Evaluation of the functionality, practicality, and quality of chronic myeloid leukaemia mobile health applications

John Choi, Cassandra Cooper, Jennifer Jupp, Zahraa Jalal, Andrea Preston and Nick Duncan

Background: Mobile health is an increasingly utilized healthcare technology. Within the field of oncology and haematology, smartphone applications (apps) can help empower patients to self-monitor their health and support medication adherence.[1] Additionally, medication apps can offer additional features that can track disease symptoms, side effects, identify drug interactions, and support ongoing engagement with health.[1] In patients living with Chronic Myeloid Leukaemia (CML), this technology can be especially beneficial in reducing the burden associated with tyrosine kinase inhibitor therapy, routine laboratory and molecular testing, and managing side effects and complications.[2]

Aims: The aim of this study was to better understand the current mobile health technologies available to CML patients by systematically evaluating the functionality, practicality and quality of four CML apps.

Method: As part of a larger study, 'Evaluation of a Smartphone App (My CML) to Support Patients with Chronic Myeloid Leukemia', existing CML apps were identified and benchmarked using validated medication app scoring tools. The four apps identified were 'My CML', 'CML Life', 'CML Today' and 'Know Your CML'. Two investigators (a clinical pharmacist and a pharmacy student) downloaded the Android and Apple versions of all four apps. They were not made aware beforehand that the 'My CML' app was being evaluated in the larger study. Each app was first assessed for practicality and functionality.[3] This was followed by an assessment for quality using the MARS scoring tool, a validated instrument that rates apps according to four categories: engagement, functionality, aesthetics, and information quality.[4] Both investigators tested the apps for 10 min prior to rating them. Any major discrepancies in the assessment were identified post-evaluation and resolved between the two investigators.

Results and discussion: In terms of functionality, practicality, and quality, the 'My CML' app consistently ranked the highest, while 'CML Life' ranked the lowest (Table 1). Contributing to the 'My CML' app's high practicality and functionality score were its medication database and tracking capability, adherence statistics and charts, offline useability, and stability between Android and Apple versions, which were features not consistently present for the other three apps. None of the apps, however, offered multiple user support, visual aids for correct medication use, or gamification elements such as adherence rewards and customizable alert sounds. Using the MARS quality scoring tool, investigators rated the 'My CML' app the highest in nearly every category, noting its simple but engaging design, the accuracy of information, and the variety of features it provided (Table 1).

Table 1. Mean scores of app evaluations.

	My CML	CML Life	CML Today	Know Your CML
Practicality and functionality (maximum of 23 points)	13	7	10	10
Quality using the MARS tool (1 – inadequate to 5 – excellent)	4.2	3.3	3.6	4

Conclusion: Smartphone apps are useful tools that CML patients can use to enhance control of their health. Through a systematic evaluation of four apps currently on the market for CML patients, the 'My CML' app consistently ranked the highest in terms of functionality, practicality and quality. It is important to recognize that comparisons between apps are difficult as all four apps had the differing scope and intended purposes, which likely impacted app development. It is also crucial that further evaluations are completed by CML patients, as they are the end users and therefore the most important stakeholders in the evaluation process.

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Abstract 42
Type: Poster
Category: Research

Community pharmacy in the early detection of cancer – A survey of the perceptions of primary care professionals

Andrew Walker

Background: Compared to many European nations, UK patients experience inferior outcomes, with higher rates of cancer-related mortality.[1] Recent NHSE announcements aim to address this issue, with developments to identify patients at an earlier stage of disease.[2.] There is recognition that the current model of GP-led referral of suspected cancer patients is outdated and contributes to increases in their workload.[3,4] Subsequent to this survey, NHSE has identified community pharmacies as having a key role in addressing these care issues, with plans to introduce direct referral of patients.[5]

This survey aims to investigate the perceptions of primary-care staff towards the current, and anticipated workload associated with the current referral process, the potential role of community pharmacy in the early referral of patients with suspected cancer, and interventions that community pharmacy services may provide to elicit the most significant impact.

Methodology: A survey of attendees of the Best Practice: Primary Care conference (12/13 October 2021) was conducted. Surveys hardcopies were provided to attendees of presentations made on behalf of BOPA and electronically embedded within the conference app. E-surveys were made available for a total of seven days from 12 October 21. All survey responses were anonymised, with hardcopies managed by independent conference staff and data from electronic submissions anonymised at the source. Data were analysed using Microsoft Excel®.

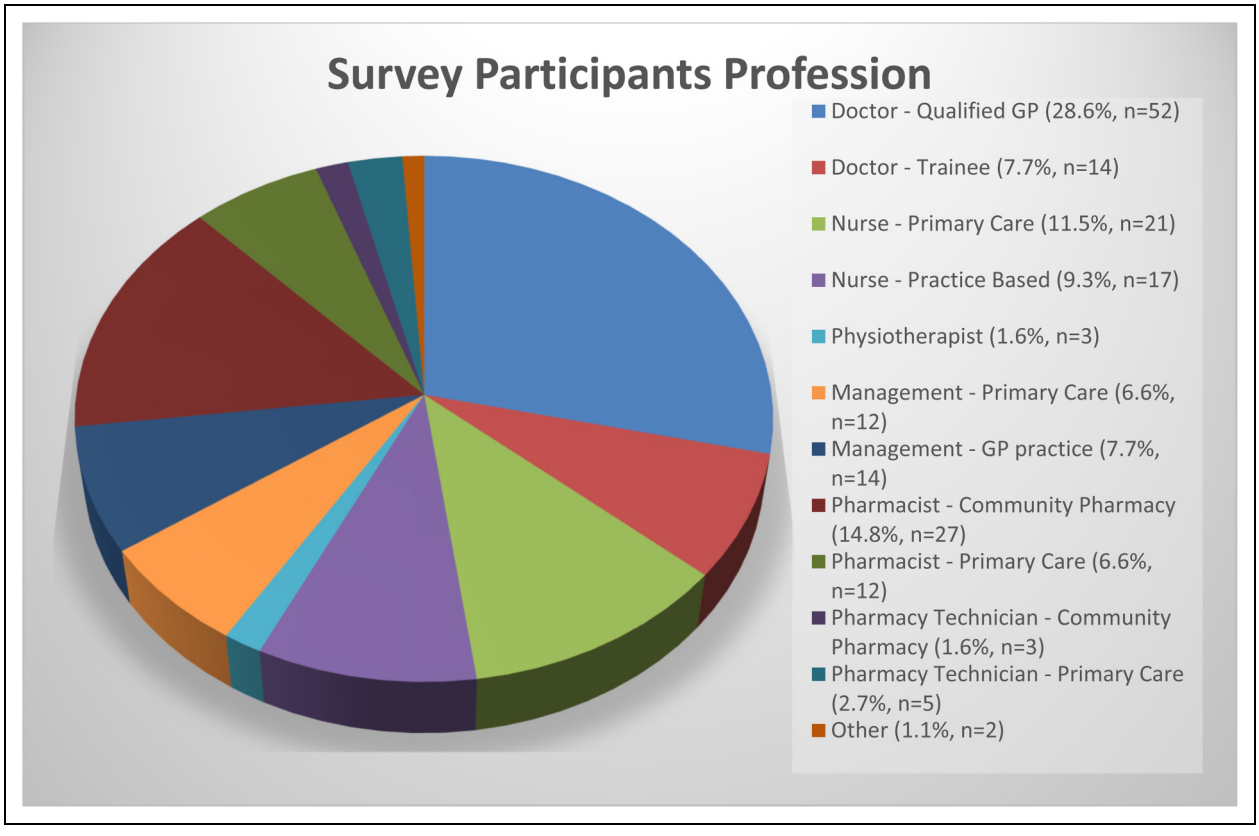

Figure 1. Respondents profession.

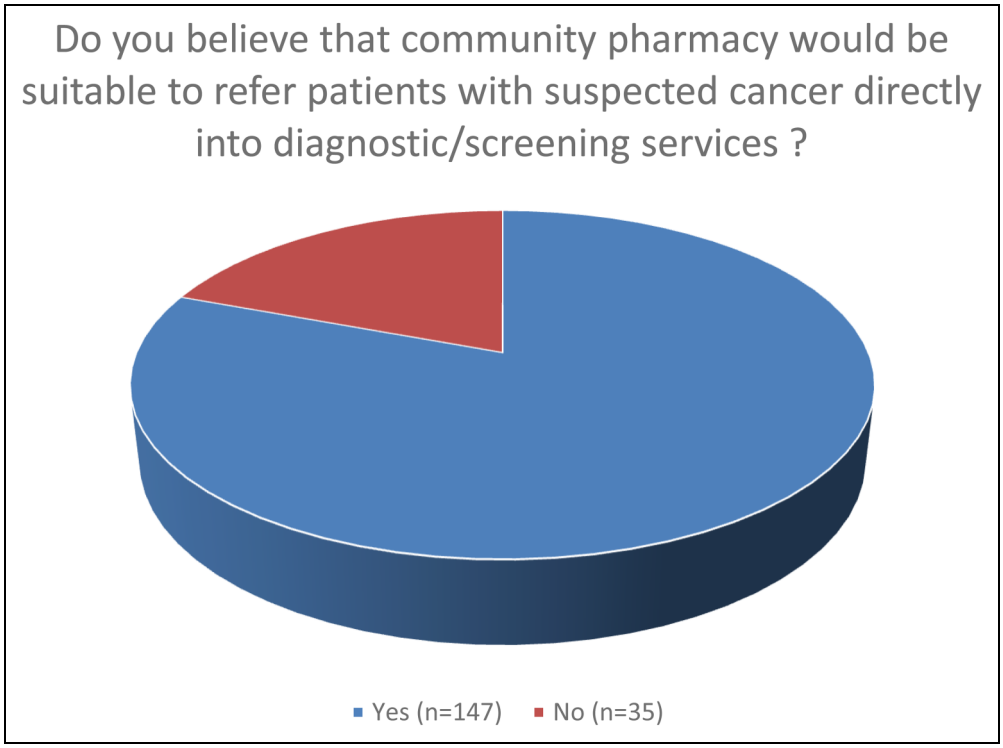

Figure 2. Responses to question – Do you believe that community pharmacies would be an appropriate venue to refer patients with suspected cancer directly into diagnostic/assessment services?

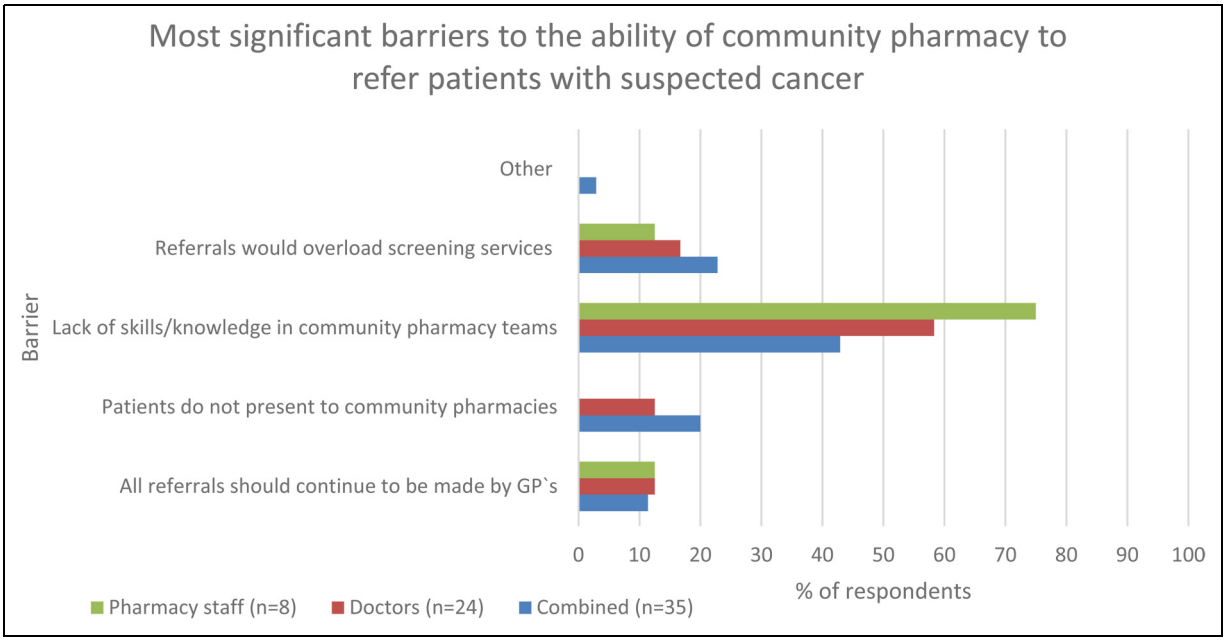

Figure 3. Most significant barrier to the ability of community pharmacies to refer patients with suspected cancer – is respondents who do not believe community pharmacies would be suitable to refer cancer patients.

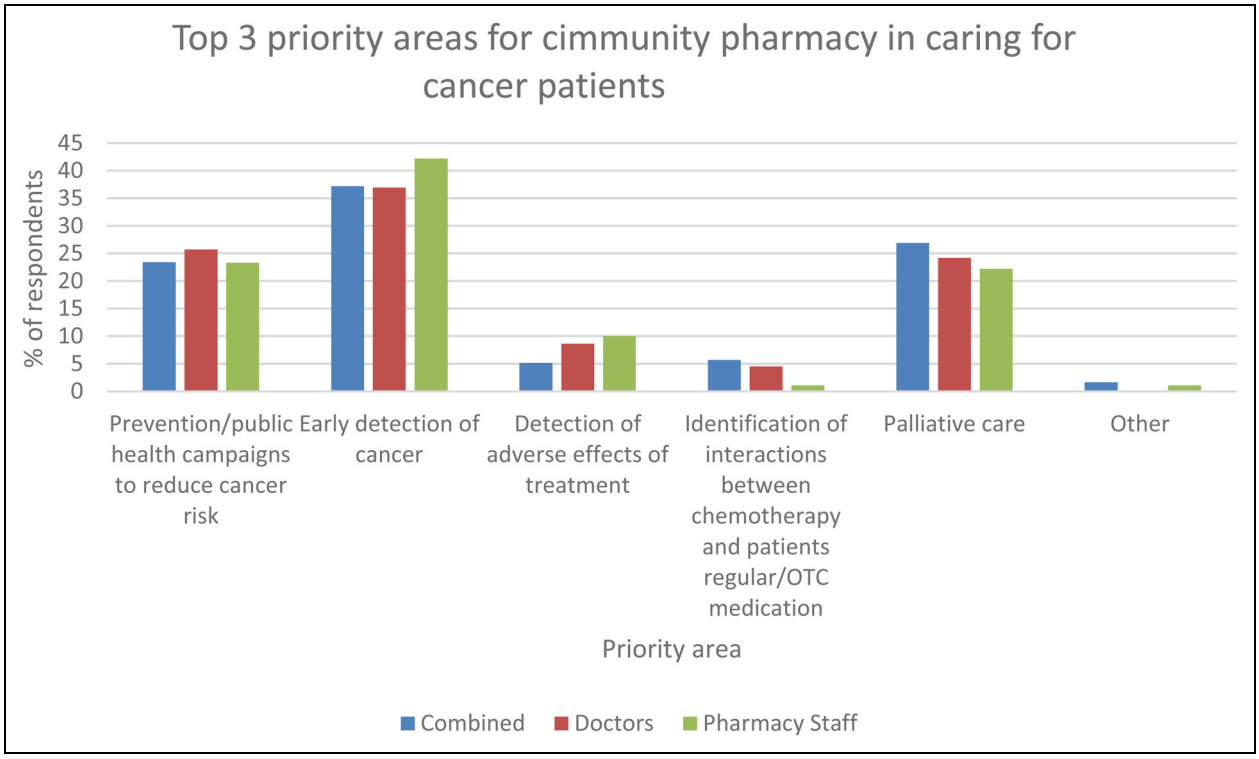

Figure 4. Top 3 priority areas for community pharmacy in caring for cancer patients.

Results: 182 completed surveys were collected (73 hard-copies, 109 electronic), and 21 uncompleted surveys were discarded. The respondents' profession is presented in Figure 1. A breakdown of the survey results is presented in Figures 2 to 4.

Discussion: This survey suggests that primary-care clinicians consider the current workload associated with GP referrals of patients with cancer symptoms to be challenging, and anticipate the situation will be even more so in the future. The majority believe that the current referral process should change to allow other primary-care services to refer patients (83%).

The majority of sampled primary-care clinicians consider community pharmacies as suitable for a direct referral pathway for patients with suspected cancers (80.7%) (Figure 2). However, a significant minority of doctors sampled do not consider such a pathway as suitable (36%), with most expressing concerns over perceived competence from community pharmacy staff as the most significant barrier (58.3%) (Figure 3).

The majority of community pharmacy staff see community pharmacy as suitable (73%). A lack of relevant skills was also identified as the most significant barrier amongst those who did not believe community pharmacy would be suitable (75%).

There was a high degree of concordance in the priority setting, with the overall sample, doctors and community pharmacy staff all identifying early detection, prevention/public health, and palliative care (Figure 4).

These results suggest that there is an urgent, unmet need for a training programme to support community pharmacy staff in recognising and referring patients who present with suspected cancers. The BOPA Lets Communicate Cancer programme has been developed to address this need and there is ongoing work to assess its impact.[6] There are also issues regarding perceptions of the competence of community pharmacy teams from some doctors which may benefit from further investigation to characterise more fully.

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Abstract 43
Type: Poster
Category: Research

Tolerability of first-line therapy for multiple myeloma: A single centre experience

Dimitra Dede, Maggie Bendle and Janitha Vasavan

Introduction: The treatment of multiple myeloma continues to evolve rapidly with the arrival of multiple new drugs. The choice of specific therapy is affected by many variables including age, performance status, renal function, comorbidities, and eligibility for stem cell transplantation.[1] Classes of drugs include immunomodulatory drugs, proteasome inhibitors, alkylating agents, corticosteroids and monoclonal antibodies targeting CD38, such as daratumumab. The need to give the appropriate treatment before co-morbidities/complications arise is important and the selection of the right regime will potentially improve patient adherence, cumulative drug exposure and deep and durable response. This study reviewed the tolerability of first-line treatments and dose adjustments that are made with a view to see how a pharmacy may be able to provide education and support in managing these tolerability issues.

Methods: Retrospective analysis of patients undergoing first-line treatment for multiple myeloma from June 2021 to June 2022 was reviewed. Patients were excluded if they had additional cancer diagnoses than MM. Baseline characteristics were recorded (age, race, ECOG at the start of treatment). The duration of treatment, regimen prescribed, dose delivered, reasons for treatment delays, discontinuation or dose reductions and patient outcomes were recorded. Toxicities were graded as per CTCAE v4.03 and any compliance issues were recorded.

Results: Fourteen patients were reviewed and the treatments used included VTD once weekly without thalidomide dose escalation (n = 2) and with thalidomide dose escalation (n = 4), VTD twice weekly (n = 1), Dara-VTD (n = 3), CTD (n = 1), Lenalidomide-Dex (n = 2) and weekly Bortezomib (n = 1). 57% of patients were found to have been discontinued from their first-line treatment due to tolerability. 50% of patients were found to have received a dose reduction. Median time on treatment prior to dose reduction was 4 months (Bortez/Thalidomide 50 escalated to 100 mg Dex), 3 months (Dara VTD), 1 month (VTD SC weekly) and for len/dex patients was initiated on a reduced dose (due to conditions, i.e., Alzheimer's). The percentage dose reduction for these patients was also noted as the most common clinical toxicity and the reason for discontinuation or dose reduction was neuropathy (n = 8). Other reasons noted were hospital admission, neutropenia, weakness, and dizziness, see Graph 1. Of the 14 patients reviewed; two have achieved CR, one has died, one completed treatment but relapsed and the remaining continue on treatment PRO not yet complete. Factors that contributed to the patients' not being compliant were found to be patients' personal commitments preventing them from attending the hospital (n = 1), distant location to travel from (n = 1), confusion with medications (n = 1) and mental health issues (n = 1).

Conclusion: Few patients were able to achieve completion of first-line treatment protocol without dose delay, dose reduction or discontinuation of therapy, with 50% of patients requiring dose reduction prior to their first, second or subsequent cycle of treatment and 57% requiring discontinuation and switching to an alternative line of treatment. The impact on PRO and PFS is yet to be evaluated. Compliance with medications requires further investigation, and difficulty attending hospital appointments was sighted twice as a reason for compliance issues so further review into how hospitals can make treatment more accessible would be beneficial.

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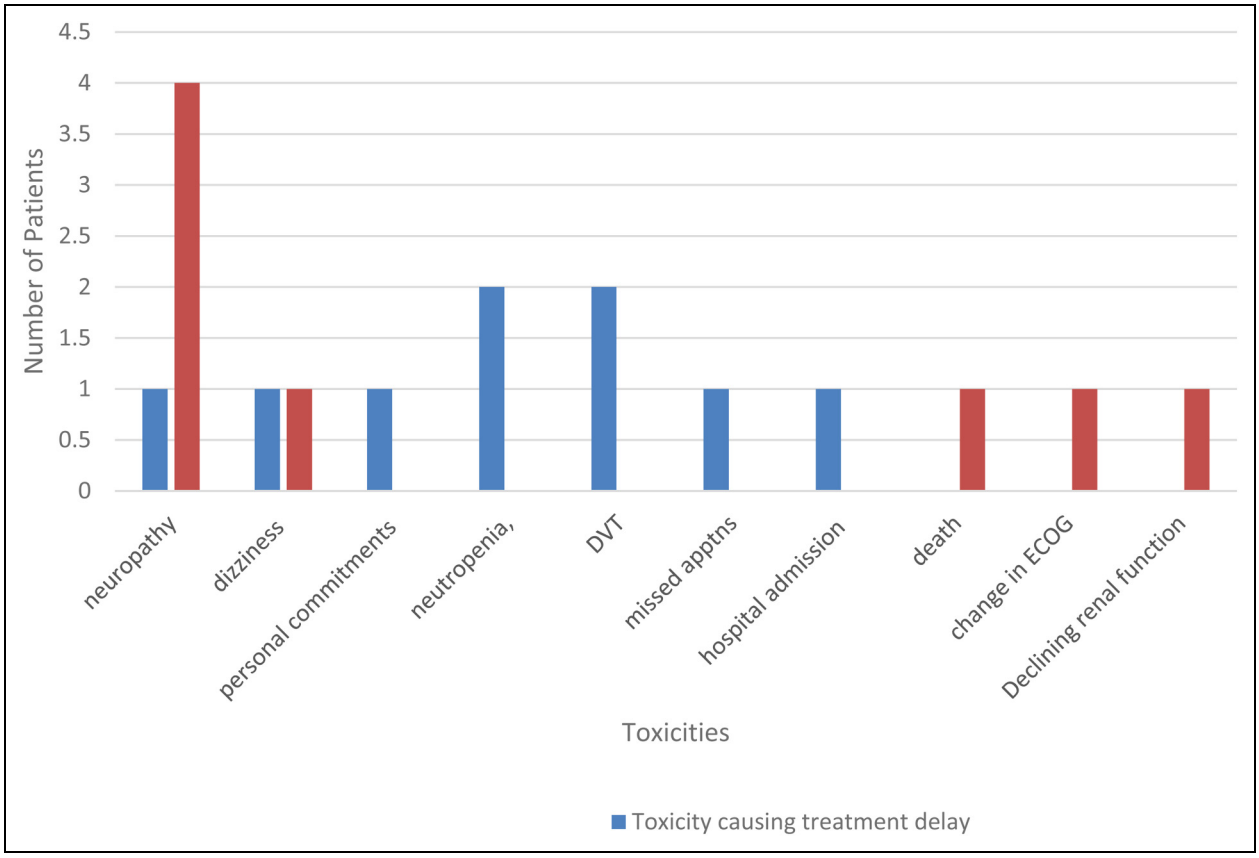

Graph 1. A graph to show causes for MM treatment delay/discontinuation.

Abstract 44
Type: Poster
Category: Research

An International Society of Oncology Pharmacy Practitioners (ISOPP) Survey of biosimilar implementation in oncology practice in Africa

Emma Foreman, Winne Mwangi and Eunji Na

Background: The implementation of biosimilars has been shown to reduce costs and improve access to biological medicines in many countries around the world. This is important in the field of oncology where the use of targeted biological medicines has improved cancer outcomes in several tumour types. In 2019, an ISOPP survey identified several barriers to biosimilar implementation faced by oncology pharmacists internationally. The African region was identified as facing several challenges to implementation that were different from those experienced in higher-income settings.

Purpose: The survey was designed to explore these challenges further, with a view to designing educational materials and resources which meet the specific needs of oncology pharmacists and other oncology professionals in Africa.

Method: A questionnaire was drafted based on the original international questionnaire, and then discussed with a focus group of African pharmacists via Zoom to adapt the questions to reflect African practice. The finished questionnaire was distributed to ISOPP members and shared further using local professional networks and national oncology pharmacy associations.

Results: Sixteen responses were received from a range of African countries: Nigeria (n = 5), Kenya (n = 3), Ghana (n = 2), Malawi (n = 2), Rwanda (n = 1), South Africa (n = 1), Uganda (n = 1) and Zambia (n = 1). The majority (94%) of respondents were hospital pharmacists from a range of institutions including private, government, academic and specialist hospitals. 94% of respondents were already using biosimilars, and all planned to use them in the future. The biggest factor influencing the decision to use biosimilars was cost, with most treatments being funded completely or partly out of pocket or via a health insurance scheme. The range of products available varied. Supportive medicine biosimilars such as filgrastim and epoetin were

available to 87% and 69% of respondents, respectively; around 60% of respondents had access to rituximab, trastuzumab and bevacizumab biosimilars. Infliximab (16%) and cetuximab (25%) were the least available biosimilar products. The biggest barriers to implementation were a lack of availability of licensed biosimilar products and the reluctance of prescribers to switch established patients to a biosimilar. A quarter of respondents indicated the availability of unlicensed biologic medicines, known as 'biomimics'. Knowledge and awareness of biosimilars were rated as low among both patients and healthcare professionals, highlighting a continued need for education and training. Suggested resources to address these needs were prescribing guidelines, patient education materials and healthcare professional education materials, with in-person training and webinars being the preferred platform for education.

Conclusion: African pharmacists are keen to use biosimilars in their institutions, seeing cost savings as the main advantage. The main challenges identified were the availability of licensed products, suggesting regulatory issues of problems with the market for biosimilars in Africa, and a lack of understanding about biosimilar products among both patients and healthcare professionals. It would be useful for ISOPP to develop some education and training materials adapted for use in the African region, but further work is required at the governmental level to improve biosimilar availability.

Abstract 45
Type: Oral & Poster
Category: Service Development / Improvement

Joint working between NHS and commercial sector to promote self-administration of subcutaneous systemic anticancer therapy (SACT) in breast cancer patients: A patients' perspective

Hei Wan Wendy Ng, Dr Vikash Dodhia, Carla Alves, Malgorzata Wojtas, Professor David Miles, Dr Amy Guppy, Sarah James, Dr Karen Harrold, Aolat Adisa, Tapiwa Tome, Zarina Lyner, Jonathan Bennett and Rizwan Majid

Objective: Trastuzumab (T) is a humanized monoclonal antibody used in the treatment of HER2-positive breast cancer and is available as a subcutaneous (SC) formulation thereby allowing short and convenient administration. A lack of trained nurses to administer T at home and/or train patients at home to self-administer, together with challenges in maintaining cold-chain delivery have impeded the uptake of home administration. In order to support patients' ability to self-administer T at home, we have implemented an educational programme that includes nurse-led training, education material, support apps and follow-up telephone clinics. Home delivery of pre-filled syringes was enabled in collaboration with commercial providers for aseptic and logistic. The aim of this pilot study was to evaluate the utility of this programme from the patients' perspective and to assess patient satisfaction and its impact on quality of life (QOL).

Methods: A previously validated Self-Injection Assessment Questionnaire (SIAQ) was modified to assess patient satisfaction, perceptions and the impact of the programme. Patients, who had agreed to enrol on the 'self-administration' scheme, were asked to complete the questionnaire at baseline, at the third training session and at the second self-administered dose.

Results: All 14 patients offered the questionnaire responded to all questions. The median age was 58 years old, (age range 43–76): 11(79%) were Caucasian, 2(14%) were Asian and one (7%) was African/Caribbean. The average distance from their home address to the hospital was 10.1 miles (range 4–19). Following completion of the 1:1 nurse training, there was a significant improvement in patient confidence to self-administer sc. T ($p = 0.03$). No differences in 'feeling in control of their treatment' or 'satisfaction of attending hospital appointments' were noted. Of the 11 patients who reached the self-administration stage, 10 pts (91%) reported that they felt 'very confident' and 8 pts (82%) reported that it was 'very easy' to give themselves the injection. All patients were 'very satisfied' with self-administration and felt that the 1:1 nurse training programme helped them to be more confident. 10 pts (91%) found the App and written information useful as well as the pre- and post-administration telephone clinics. All patients reported that the self-administration programme had a positive impact on their QOL by reducing the number of hospital visits. In the first 4 months of self-administration, each patient reduced their hospital attendance by an average of eight appointments (median = 8) equating to 10 h of time that would have been spent at hospital.

Conclusion: The subcutaneous T self-administration programme was well received by patients. The nurse training sessions and supportive materials enabled patients to feel more confident about self-administration with no reported incidents or adverse events. This led to fewer hospital visits and improved QOL. This programme was critically dependent on the services of a

commercial compounder and homecare provider, emphasizing the importance of joint working between the NHS and the commercial sector. Evaluation of this programme will continue.

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Abstract 46
Type: Oral & Poster
Category: Service Development/Improvement

Prevention of herpes zoster infection post allogeneic haematopoietic stem cell transplant: An evaluation of a change in antiviral policy

Letisha Brown, Nicky Marchant, Nick Duncan

Introduction: Herpes zoster infection, caused by reactivation of latent varicella zoster virus (VZV), is a common complication following haematopoietic stem cell transplantation (HSCT). It typically presents as a self-limiting dermatomal rash, but can also lead to dissemination, post-herpetic neuralgia, and opportunistic infections.[1] Aciclovir is widely used to reduce the risk of herpes virus reactivation but there is a lack of consensus as to the most appropriate duration of prophylaxis. Guidelines at the Queen Elizabeth Hospital (QEH) were updated in August 2019, such that the duration of prophylaxis was increased from a short-term (35 or 100 days depending on patient factors) to a long-term schedule, whereby all VZV seropositive patients received oral aciclovir (400mg twice daily), until 1-year post-transplant. We aimed to assess the efficacy of long-term aciclovir by determining the effect of the new and old schedules on VZV reactivation rates and levels of rebound reactivation, whilst also identifying any predisposing factors for VZV reactivation.

Methods: Patients who underwent an allogeneic HSCT at the QEH between 01 June 2018 and 29 September 2020 and received prophylactic aciclovir were included. Patients were split into two groups depending on the length of prophylaxis [$\leq$ 100 days (cohort 1) vs. >100 days (cohort 2)]. Relevant demographic and outcome data were collected from hospital electronic patient records. Statistical analysis was performed using IBM SPSS Statistics Software version 27.

Results: 200 patients were included in the study, 45 patients in cohort 1 and 155 patients in cohort 2. Overall, the incidence of VZV reactivation was low with 4% of patients reactivating within the first year of transplant and a total of 10% reactivating during the total study period (with a follow-up range of 438–1202 days) (Figure 1). Long-term prophylaxis with aciclovir reduced the VZV reactivation rate at one-year post-transplant when compared to short-term prophylaxis but this difference was not statistically significant. (3.2% vs. 6.7%, OR = 0.47, [0.11–2.03, 95% CI], $p = 0.38$, Fisher's exact test). Similar levels of rebound reactivation were seen on cessation of aciclovir in both cohorts and there was no difference in the rates of reactivation over the whole study period (10.3% for cohort 2 vs 8.9% for cohort 1 $p = 1.0$, Fisher's exact test) The presence of GVHD was the only statistically significant risk factor for VZV reactivation in this patient cohort (OR = 4.47 [1.44–13.89, 95% CI] $p = 0.009$, chi-squared test).

Discussion/conclusions: The low VZV reactivation rate in our study supports the use of aciclovir as an effective strategy for preventing VZV reactivation.[1] The optimal duration of aciclovir remains unclear with only a trend towards benefit shown with the longer (1 year) strategy. This lack of statistically significant benefit may have been influenced by sample size and there may be merit in extending the study to include a larger patient cohort. Importantly, GVHD emerged as a clear risk factor for VZV reactivation with a 4-fold increase in risk demonstrated. Finally, the issue of rebound reactivation may be best addressed by additional prophylactic strategies such as the inactivated varicella zoster vaccine.[2]

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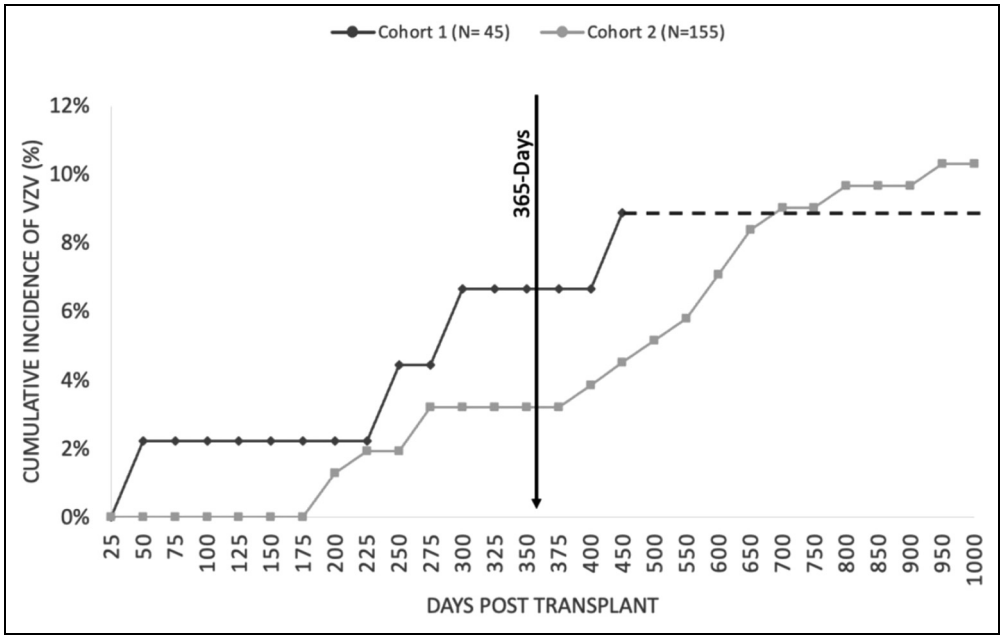

Figure 1. Cumulative incidence of VZV infection post allogeneic HSCT.
HSCT: haematopoietic stem cell transplantation; VZV: varicella-zoster virus.

Abstract 47
Type: Oral & Poster
Category: Service Development/Improvement

Not normal for you? The design and evaluation of a cancer red flag referral intervention for community pharmacies

Jacqueline Carol Lewis, Shereen Nabhani-Gebara

Background: Community pharmacies may be an ideal setting in which to promote early cancer detection due to their accessibility, opening hours and familiarity with the local population. Research confirms that red flag symptoms (red flag symptoms include: persistent cough, persistent change in bowel habits, unexplained weight loss and unexplained bleeding) are frequently seen within community pharmacies. This study is a prospective interventional proof of concept study investigating the acceptability and utility of a red flag referral intervention that incorporates a card given to pharmacy users following conversational intervention in the community pharmacy. The objectives of the study were to: evaluate the acceptability and perceptions of pharmacy teams. Investigate the acceptability and perceptions of the pharmacy users. Investigate the number of referrals conducted.

Methods: This study was conducted within Devon. A convenience sampling approach was adopted. Pharmacy inclusion was based on willingness to participate and level of engagement in previous training. Pharmacy users were recruited upon elicitation of a suspected red flag cancer symptom in conversation with a member of the pharmacy team. The study was active for 6 months in each pharmacy. Those pharmacies who agreed to participate in the study were offered training to those staff who would be disseminating the red flag referral intervention. The training was delivered face-to-face using video and group training sessions at each pharmacy. Questionnaires were designed to capture the experience of pharmacy teams post-training and post-study, as well as the pharmacy users who received the red flag referral intervention. Responses were analysed using descriptive statistics, facilitated by IBM SPSS Statistics 25.

Results: A total of 11 community pharmacies were approached to take part in this study and 10 agreed to participate. Between May and November 2019, a total of 38 pharmacy users were given the red flag referral intervention. The average number of cards administered per pharmacy was 3 (SD = 3.2; range 0–11). The top three reported symptoms were skin (n = 16), a persistent cough (12), and indigestion (n = 6). Representatives from each pharmacy (n=6) reported over 65% of their pharmacy users were willing to discuss their red-flag symptoms. The training enabled more than 79% of staff (n = 13) to fully understand the intervention and when to refer people to their GP. After the training, over half of the staff were confident in their ability to recognise red flag symptoms, refer people to their GP and have sensitive conversations about red flag symptoms. When reflecting on the extent to which elements of the intervention

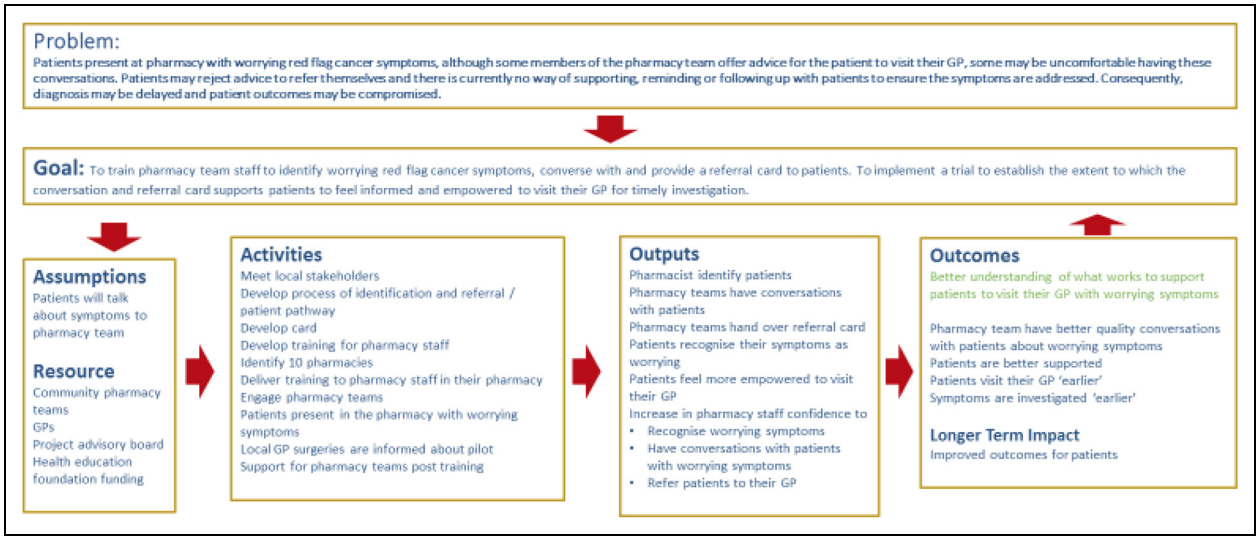

Figure 1. Logic model.

had encouraged pharmacy users to decide to visit the GP and discuss their symptoms, more than three-quarters of the sample (n = 18) felt that both the card and the conversation had helped or encouraged them fully to see their GP and discuss their symptoms.

Discussion/conclusion: This proof of concept study suggests that a red flag referral intervention delivered by community pharmacies is acceptable to both pharmacy users and staff and leads to patients visiting their GP when they otherwise may not have. Red flag symptoms include persistent cough, persistent change in bowel habits, unexplained weight loss and unexplained bleeding.

Abstract 48
Type: Oral & Poster
Category: Service Development/Improvement

Retrospective UK analysis of dihydropyrimidine dehydrogenase (*DPYD*) gene testing, toxicity and ethnicity for patients receiving fluoropyrimidines (5-fluorouracil, capecitabine and tegafur) – National Transformation Project from the NHS Genomic Medicine Service Alliances (GMSAs)

Nisha Shaunak, Jessica Keen, Anna Kim, Rajinder Nijjar, Emma Groves, Dharmisha Chauhan, Rachel Palmer, Paul Selby, Hayley Wickens, Lucy Galloway, Sophie Harding, Fionnuala Green, Aris Saoulidis, Veronica Chorro-Mari, Kate North, Catherine Chaytor, Alice Tew, Simone Gelinas, Vinodh Kumar, Munir Pirmohamed, William Newman and Paul Ross

Background: Fluoropyrimidines are frequently used for many cancer treatments and are metabolised by dihydropyrimidine dehydrogenase (DPD) enzyme; encoded by *DPYD*. 3–6% of the population has a *DPYD* variant, which, without appropriate dose reduction, has been associated with severe toxicity/death.[1]

DPYD testing offered by NHSE Genomic Medicine Service targets four common, well-established toxicity-associated variants.[2] It is noted variants are based on trial data conducted predominantly in people of White European ancestry.[3]
An audit at 5 London cancer centres showed the impact of *DPYD* testing locally.[4] We repeated this snapshot at a national level to obtain a more detailed overview, based on real-world data, for clinical decision making, adoption of guidance and subsequent dosing.

Objectives: For all patients starting on fluoropyrimidines during September 2021:

1. Review UKCB guideline adherence for *DPYD* testing and recommended dose-reduction UK-wide[1]
2. Capture the proportion of patients not tested for *DPYD*
3. Observe potential associations of ethnicity, toxicity & *DPYD* variants
4. Characterise patient dosing with an identified *DPYD* variant

Methodology

- The data collection tool used by Nijjar et al.,[4] was modified to incorporate ethnicity, region, diagnosis, identified variant & recommended dose reduction. Optional sections were added to record toxicity, dose amendments and free text comments.

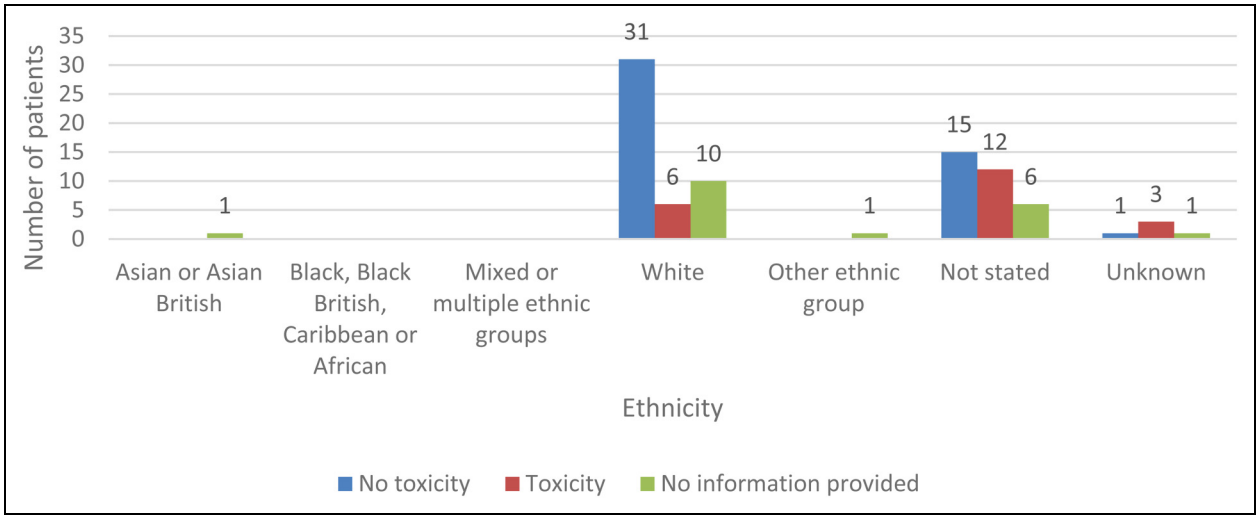

Figure 1. Occurence of toxicity by ethnicity where a DPYD variant was identified

- The tool was emailed to Cancer Lead Clinicians at UK cancer centres delivering fluoropyrimidine SACT via GMSA Pharmacy leads (or equivalent for Home Nations).
- Following ethics approval, data were collected retrospectively during February–May 2022 for all patients receiving first-cycle fluoropyrimidine SACT during 1–30 September 2021.
- Pseudo-anonymised data was submitted by organisations and collated centrally.

Results: Data for 2061 patients was submitted from all GMSAs, in Northern Ireland & Wales. Scotland was unable to submit due to Covid-19 pressures. 300 patients did not meet the inclusion criteria.

1638/1761 (93%) patients had DPYD results available prior to treatment starting. 83/1761 (5%) were not tested for DPYD due to previous fluoropyrimidine therapy. 40/1761 (2%) patients had no result available pre-first cycle and some received anecdotal dose reductions.

87/1761 (5%) had a confirmed DPYD heterozygous variant. No homozygous variants were identified (see Figure 1). 74 patients reported toxicity of which 21 had an identified variant.

79/87 (91%) followed recommended dosing [1 = 75% dose; 1 = 60% dose; 77 = 50% dose], 2/87 (2.3%) dosed outside recommendations – 1 developed toxicity.

Discussion: The data analysed was similar across the regions and the frequency of the four tested *DPYD* variants (5%) is in line with previous estimates.[1,4]

This service evaluation identified that a *DPYD* result was available in 1638/1678 (97.6%) of cases prior to starting fluoropyrimidine SACT. Broad acceptance of dosing guidance for patients with identified *DPYD* variants was demonstrated.

Limitations: Notably, for 560/1761 patients, ethnicity data was unknown, limiting observation of statistical correlation with DPYD variants/toxicity.

Toxicity/dosing data fields were optional and not standardised, resulting in small sample sizes and limiting statistical analysis.

Next steps: Further analysis is underway to map the proportion of identified variants according to GMSA demographics/population data.

A planned prospective audit will collect patient data over multiple treatment cycles and provide a more complete dataset to assess the impact on clinical outcomes.

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Abstract 49
Type: Oral & Poster
Category: Service Development/Improvement

Mapping the National Genomics Cancer Test Directory (NTD) against commissioned cancer drugs for adult solid tumours

Nisha Shaunak, Dharmisha Chauhan and Rajinder Nijjar

Background: The NTD, first published in August 2018, defines genomic tests routinely commissioned by NHS England (NHSE) for testing (using appropriate sequencing technology) by the Genomic Laboratory Hubs (GLH). Currently, the NTD consists of two directories – rare diseases and cancer.[1]

The number of adult cancer drugs/indications commissioned by NHSE and the Cancer Drugs Fund (CDF) is rapidly increasing.[2] Genomic technology alongside drug discovery is advancing with the ability to identify genomic cancer mutations and variants linked to treatment more accurately. The introduction of panel testing alone allows up to six to eight genes to be sequenced simultaneously compared to single-gene mutation testing.[1]

Interpretation and implementation of complex therapies in a rapidly evolving genomic landscape can be challenging and requires a robust understanding of what is available. Failure to understand this can lead to patient variability in drug access.

Obtaining a baseline understanding of the availability of cancer genomic testing against available commissioned SACT treatments can facilitate and support implementation.

Objectives: To identify the cancer genomic tests available for adult solid cancers by:

1. Tumour indication and number of genes targeted
2. Targeted genes and their relationship to potential SACT, commissioned via CDF/NHSE.

Methodology: For all adult solid tumours, NTD cancer genetic tests were mapped to routinely commissioned NHSE/CDF SACT. Additionally, any test that could lead to potential SACT treatment, diagnostic and/or family history implications were also mapped.[1,2]

Commissioned SACT drugs were identified from the national CDF list and a centrally held provider letter spreadsheet.[2,3]

Genomic tests for SACT available via Expanded Medicines Access Schemes, project Orbis or compassionate supply programmes were excluded from the mapping process.

Results: Within the solid cancer NTD, 47 indications and 115 gene alteration tests were identified – of which: 66 were panel tests; 38 single gene tests & 11 were microsatellite instability (MSI) tests.

Of the 115 tests, 75 were SACT-related, of which 63 are linked to commissioned CDF/NHSE drugs (Table 1). 17 tests were linked to SACT but were not routinely commissioned on the NHS. 37 tests were utilised for diagnostic and family history management. Notably, some genetic tests had dual/trio purposes.

Table 1. A number of genomic tests for adult solid malignancies commissioned and implemented within England linked to clinical management.

Total number of tumour sites within the NTD e.g., colorectal, ovarian, endometrial	Number of gene/ chromosomal tests listed within the NTD	Genetic tests listed in NTD related to potential SACT	Test for diagnostics/ differential diagnosis	Genetic test to assess cancer risk/family history e.g., Lynch syndrome
47	115	75 (17 tests not routinely commissioned on NHS)	80	13

Note: The total number of tests will not equal 115 as a genomic test can have two or three clinical applications for patient management.

Discussion: This baseline assessment demonstrates the complex landscape of available genomic tests and treatments. There are several cancer indications that can be mapped to the commissioned genomic tests available.

As oncology clinicians, it is important to understand genomic test applications in practice for cancer. As we move into the genomics era, future cancer pharmacists will be ideally placed to play a key role in genomic MDTs/clinics to advise on the best cancer treatments based on individualised patient genomic profiles.

The next steps, working with the GMSAs and GLHs and NHS E/I, are to:

- Review potential regional variations in:
  - ordering tests
  - pathway stage tested
  - technology being used - hotspot vs panel testing
  - Potential barriers to uptake of SACT
- Review potential variability and barriers in uptake across the regions with focused analysis by tumour type
- Repeat mapping for haematological tumours

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Abstract 50
Type: Oral & Poster
Category: Service Development/Improvement

Development of cancer-associated thrombosis (CAT) educational training programme for allied health professionals (AHPs)

Kieron Power, Laura Broughton, Sarah Scargill, Nathan Hutchinson-Jones and Anthony Maraveyas

Background: Patient education in and, the prevention and management of cancer-associated thrombosis (CAT) is an important aspect of supportive management and long-term health of cancer patients and is advised in multiple guidelines.[1,2] However, there is evidence across western health systems that the provision of quality service remains an unmet need.[3,4] Allied health professionals (AHPs) such as pharmacists and nurses already play a crucial role in the management of multiple aspects of the cancer journey. There are exemplar CAT services provided by teams in which the patient-facing individual is an AHP[5] but these services have developed impromptu and are based on the expediency of local resources with no underpinning training.

Objectives: To develop educational materials for AHPs and cancer patients which will help fill the current gap in knowledge and provide competency for the management of CAT.

Method: The educational materials in this project have been developed by members of three award-winning and pioneering CAT services across the UK. From September 2021 to July 2022, during monthly meetings, members (i) identified the required competencies and training needs of AHPs, (ii) formulated aims/objectives for the training programme and, (iii) established where the information provided to patients could be improved. Existing material (ISTH Academy, Pancreatic Cancer Action's video, online risk scores) was reviewed and recommendations, links and access were incorporated accordingly. The patient leaflet has been reviewed by an NIHR INVOLVE patient and public involvement group. Appropriate permissions/approvals have been granted to present this information. The project was supported by an unrestricted, hands-off education grant from Bayer.

Discussion: The materials comprise (1) a training booklet for AHPs which includes current guidelines for CAT management, (2) a risk assessment scores pack with recommendations on which scores to use for different types of CAT, (3) a case studies booklet with questions and accompanying suggested answers, (4) an educational video that includes scenarios commonly encountered in CAT clinics and, (5) a patient leaflet which is a wealth of easy-to-read information.

Much is still to be done to improve the education of patients and the competencies of HCPs in CAT. The materials developed in this project were vetted by AHPs who had already developed exemplary services run by pharmacists and nurses (Figure 1). The main criteria for resource assessment and incorporation were to be evidence-based, guideline compatible and practicable. This programme provides teachable and transferable CAT training for AHPs that should result in a standardised and assessable competency.

Conclusion: This is a comprehensive patient and AHP-focused educational programme that may facilitate service improvement in CAT services. The resource is shareable, easily adaptable and can be adopted by other NHS Trusts across the UK.

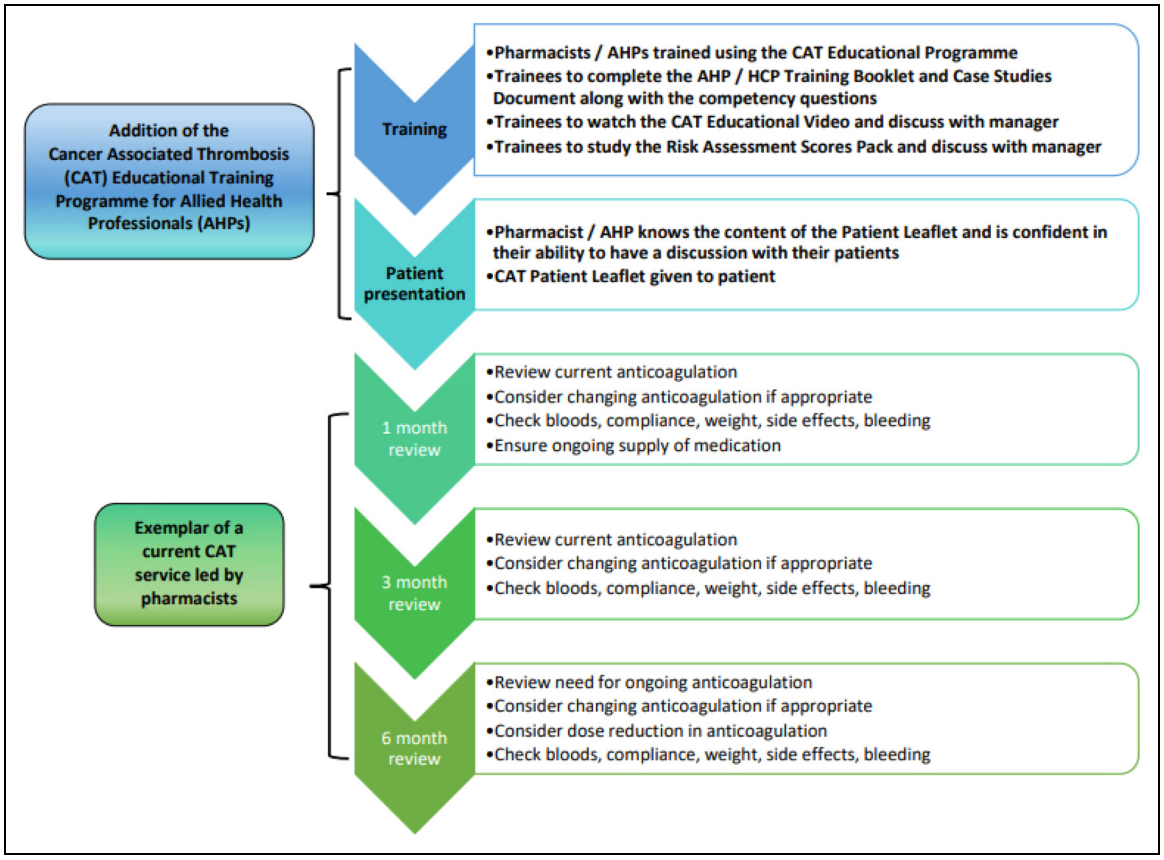

Figure 1. Schema showing how the CAT Educational Programme could be introduced into an existing AHP-led CAT service. This would ensure training is evidence-based, standardised and assessable.

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Abstract 51
Type: Poster
Category: Service Development/Improvement

The value of pharmacist independent prescribers at a tertiary cancer centre: A multidisciplinary team evaluation

Hei Wan Wendy Ng, Dr Vikash Dodhia and Sarah Lucy James

Objective: With significant advances in cancer treatment with multiple lines of treatment, cancer has become a chronic condition. The NHS Long-Term Plan (2020) has set out to improve national screening programmes to accelerate the diagnosis and treatment of cancer. It has been predicted that the gap in the future demand for the specialist oncologist workforce will be widen to 29% by 2025. Skill mix approaches, such as utilising Non-Medical Prescribing (NMP) Pharmacists to bridge the gap are urgently required. Our first studies in 2020 showed that an NMP pharmacist can improve both clinic capacity and service delivery, along with reducing cancer waiting times. In 2021, our NMP pharmacist clinics expanded

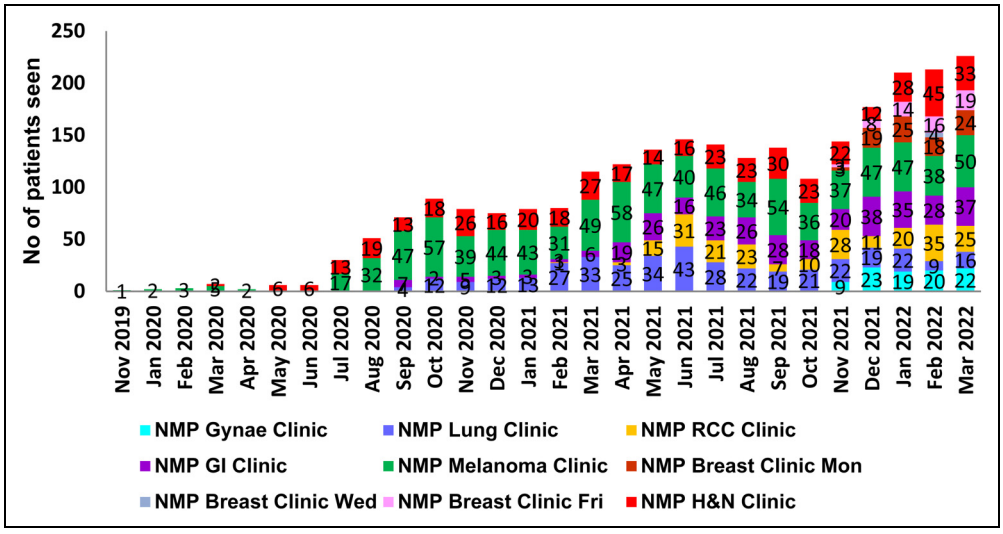

Figure 1. Chart to show the number of patients seen by NMP Pharmacists at MVCC.

from one to six tumour sites. Whilst patient satisfaction surveys have shown patients are satisfied with the consultation carried out, at present, there is little published research exploring the perspectives of the healthcare profession (HCP) working with NMP pharmacists.

Methods: Implementation of pharmacist NMP clinic provides an opportunity to improve the existing outpatient clinics' capacity, reduce cancer wait time as well as potentially optimise patients' understanding of their treatment and improving overall patient experience. To collect the views of the HCP, a semi-structured survey on Microsoft Forms was used. Open-ended questions enabled us to evaluate the positive impact of the NMP pharmacist service as well as areas for improvement.

Results: Retrospective data collected between November 2019 and March 2022 showed steady growth in outpatient clinic capacity over a 28-month period with a total of 2585 consultations conducted.

A total of 37 healthcare professionals completed the questionnaire: 13 oncologists, three registrars, five SACT-trained nurses, five clinical nurse specialists, six nurses, one pharmacist and four others. The average overall satisfaction with the NMP service was 4.73 out of 5. When asked about how they found the NMP service in comparison to their expectations, 73% (27) found it better than expected and 27% (10) found the service as expected. Four themes were identified when asked about what they like best about the NMP service including being an integral part of the clinical team, utilising expertise and knowledge in drug treatments, being very helpful in providing good support to both patients and staff, streamlining the clinic by reducing clinic waiting time and contributing to smooth running of the clinic. When asked about what could be changed all 37 responses requested the expansion of NMP services to all tumour sites. 92% (34) of respondents would definitely recommend the NMP service to their colleagues.

Discussion and conclusion: Post-COVID recovery of NHS services is currently the biggest challenge facing all health systems. This study has shown that the NMP pharmacist can integrate into the clinical team and through their expertise in drug treatments provide good support to both patients and staff. The NMP pharmacist can make a significant contribution towards the challenge of creating the additional clinic capacity required for post-COVID recovery. The NMPs were well-received and accepted by other healthcare professionals making a positive impact by providing great care to our patients.

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Abstract 52

Type: Poster
Category: Service Development/Improvement

Haematology patient satisfaction survey for medication delivery service at North Bristol NHS Trust (NBT)

Rachel Hingston and Gethin Jenkins

Background: Patients with a weakened immune system were considered at high risk for severe infection with

Covid-19 and associated complications.[1,3] In March 2020 patients with haematological malignancies were classified as extremely clinically vulnerable and advised to shield.[2] NICE produced guidance on treatment prioritisation and modifications to usual service to reduce exposure to these patients, including using or switching to oral Systemic Anti-Cancer Treatment (SACT) and introducing home delivery of medications.[4] NHS England supported this by providing interim Covid-19 funding pathways.[5] Consequently, where appropriate, NBT preferentially selected oral-based SACT regimens; introduced telephone consultations; and the pharmacy department established a medication delivery service.

Objectives: This patient satisfaction survey aimed to determine the perceived quality and value of the delivery service and identify any improvements, in order to establish the benefit of continuation.

Methodology: Over a period of four weeks from the 16th August 2021, the pharmacy team distributed the patient satisfaction survey to haematology patients having their medication delivered. Patients were provided with a pre-paid postage envelope and requested to return the questionnaire by the 24th September 2021. 87 surveys were sent out.

Results: The survey response rate was 66%.

Patients were also asked to compare to the waiting service (79% much better, 5% better, 3.5% same, 0% worse or much worse, 12.5% not circled) and for their perceived value of long-term continuation of the delivery service (96% valuable, 2% neutral, 0% not valuable, 2% not circled).

Comments were evaluated by qualitative analysis and divided into themes: description of overall service; advantages for delivery service continuation; barriers to delivery service continuation; comparison to waiting; staff feedback; service improvement. Patients appreciated the reduced time in the hospital waiting for medications and travelling/parking costs. Patients raised concerns over the cost of the service to the NHS. Descriptions of the overall service and staff feedback were positive. Improvements related to a delayed delivery as there was no stock of medication and a patient not being informed of a change in the strength of their supportive medication.

Discussion and conclusion: The results demonstrate the value of the delivery service, indicating that it is worthwhile continuing as it has improved patient experience and reduced the risk of potential exposure to infection for a vulnerable cohort of patients.

Limitations

- Patients who newly started treatment during the pandemic had no experience with the previous waiting

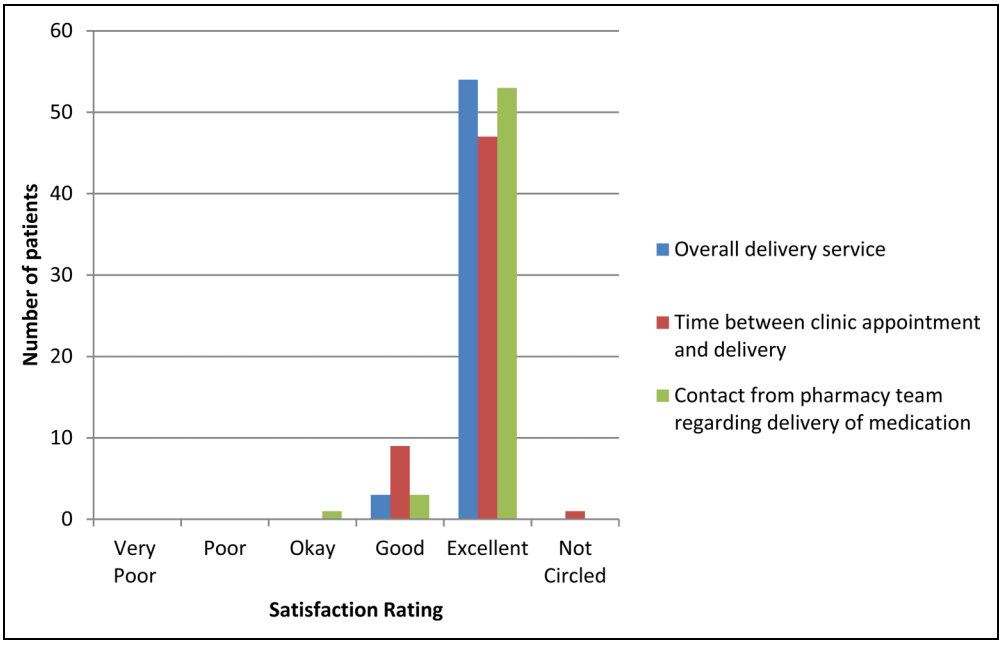

Figure 1. Patient Satisfaction Rating for Medication Delivery Service.

service. In hindsight, a 'not applicable' answer should have been provided.
- Patients started having blood in advance with their GP to reduce time in the clinic and facilitate telephone appointments. This previously delayed processing and increased waiting times.
- Specialist pharmacists now screen the prescriptions, rather than a dispensary rota where pharmacists were not always ChemoCare trained causing delays and increased waiting times.

Recommendations

- Continue taking blood in advance to aid the timely processing of prescriptions.
- Funding was sourced to continue offering the delivery service. Some patients may choose to collect when attending face-to-face appointments but continue to deliver following telephone consultations.
- Counsel on medication changes over the telephone, if not seeing patients face-to-face.
- Prepare for clinics in advance to appropriately manage stock levels.

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Abstract 53
Type: Poster
Category: Service Development/Improvement

Identifying and implementing time savings on the SACT day unit

Sarah Scanlon, Julie Mansell, Sarah Tehan Rachel Senior and Catherine Parbutt

Objectives: To identify and implement strategies to achieve time savings for patients and nursing staff on the SACT day unit.

Method: We reviewed our top 20 most commonly used drugs for opportunities to:

- Reduce administration time
- Reduce observation period post administration
- Reduce the frequency of administration
- Standardise administration time across regimes/tumour sites

The following schemes were identified:

Reduce administration time

1. Pertuzumab + Trastuzumab Subcutaneous (SC) (Phesgo®): Introduction of the combination SC product Phesgo® to replace the two separate intravenous (IV) products (for all new patients and the majority of existing patients switched). Calculated time taken to administer loading and maintenance doses of both IV Pertuzumab & Trastuzumab compared to Phesgo® SC to identify the amount of chair time saved per week.

2. Daratumumab: Stage 1: Introduction of a rapid infusion rate from dose 2 onwards – reducing administration time from (approx.) 3.5 h to 1.5 h[1] Calculated the amount of chair time per week saved by the reduction in infusion time.

Stage 2: Introduced SC administration. Calculated the amount of chair time saved per week by using the SC product (vs. rapid rate IV infusion).

3. Rituximab: Introduction of a rapid infusion rate from dose 2 onwards – reducing administration time from (approx.) 4.5 to 1.5 h. Calculated the amount of chair time per week saved by the reduction in infusion time.

Reduced observation period

1. Trastuzumab SC: Prior to September 2021, the observation period following SC administration was 6

Table 1. Results of schemes introduced in oncology.

Schemes	Pertuzumab + Trastuzumab SC (Phesgo®)	Trastuzumab SC	Zoledronic acid	Carboplatin
Reducing administration time	37.5 h of chair time saved per week	×	×	×
Reducing observation period	×	14 h of chair time saved per week	×	×
Reduced frequency of drug administration	×	×	- 7 h of chair time saved per week - Less hospital attendances for patients	×
Standardisation of the duration of drug administration	×	×	×	4 h of chair time saved per week

Table 2. Results of schemes introduced in haematology.

Strategy	Daratumumab	Rituximab
Reducing administration time	Stage 1: rapid infusion rate – approximately 21 h of chair time saved per week	
	Stage 2 – using SC product – approximately an additional 15 h of chair time saved per week compared to rapid infusion rate.	Approximately 20 h of chair time saved per week

h for the loading dose & 1 h for the maintenance dose**.** Change to SmPC in September 2021, observation period – 30 min for loading dose and 15 min for a maintenance dose. Calculated total time taken to administer loading and maintenance doses following the reduction in observation period to identify the amount of chair time saved per week.

Administration frequency

1. Zoledronic acid: For metastatic breast cancer patients with bone metastases – historically, patients have received treatment every 3, 4 or 6 weeks. Plan: to give zoledronic acid every 4 weeks for three doses and then 3 monthly (as per ESMO/ASCO guidance)[2] Calculated time taken to administer the number of doses over a 3-month period with the change in administration frequency to identify the amount of chair time saved per week.

Regimen standardisation

1. **Carboplatin.** Identified all of the carboplatin-containing regimes in the treatment of lung cancer on Chemocare®. Standardised all the regimes to administer carboplatin over 30 min & calculated the amount of chair time saved per week.

Results

See Tables 1 and 2.

Discussion & conclusion: Approximately 63 h of chair time was saved per week on the day case unit for oncology patients and 56 h per week for haematology patients. Huge benefits for capacity planning, nursing time & patient experience (less time spent in hospital or less attendances).

Future work:

- Patient home self-administration of bortezomib
- Standardise the duration of drug administration across different tumour site

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Abstract 54
Type: Poster
Category: Service Development/Improvement

Impact of the COVID-19 National Cancer Medicine Advisory Group (NCMAG) in NHS Scotland

Louise Craig, Mary McLean, Pamela Andrews, Linda Collins, John Murphy, Sally Clive, Louis Doherty, James Drinkell, Heather Dalrymple, Hana Barvik and Richard O'Connell

Objectives: The COVID-19 NCMAG was a pan-Scotland multidisciplinary group established early in the pandemic. It aimed to provide rapid evidence-based decisions for NHSScotland for the use of cancer medicines that could support reduced Covid exposure for patients or reduce the burden on cancer services.[1] An impact assessment of this novel initiative was undertaken, evaluating usage in clinical practice, and describing clinician and patient experiences.

Method: Four medicines, supported by NCMAG for use, were selected to illustrate the spectrum of intended applications (Table 1). Usage data were requested from the three Scottish regional cancer networks and compared against predicted usage. Questionnaires were developed and sent to representative cancer managers, clinicians and patients to collect data on perceptions of COVID-19 NCMAG advice. Qualitative data were summarised and synthesised.

Results: Thirty proposals were reviewed and 20 were supported for use between April 2020 and October 2021. Usage of the abiraterone combination, ibrutinib and pembrolizumab aligned with predicted use whereas usage of the pembrolizumab combination exceeded predicted use (Table 1). Favourable impacts on service, within the COVID-19 context, included oral versus intravenous administration, reduced monitoring requirements, fewer immunosuppressive regimens and reduced hospital visits. Key themes from clinicians included (i) direct benefits to 'shielding' patients by reducing time spent in high-risk hospital settings, and (ii) broader impact on pressured systemic anti-cancer therapy services by reducing a number of hospital attendances and reducing chair time. Key themes from patients included satisfaction with reduced hospital visits and reduced travel, due to concerns about the risk of COVID-19 exposure.

Discussion: Successful clinical engagement in this novel group was illustrated by the consistent submission of proposals and participation at meetings. Analysis of real-world data showed actual usage aligned with predicted usage across the three regions. Discrepancies identified between actual and predicted use for the pembrolizumab combination could be explained by the continued desire to use COVID-19 NCMAG-approved 6-weekly pembrolizumab regimen during the pandemic despite the 3-weekly regimen obtaining Scottish Medicines Consortium acceptance. It was not possible to extract data specific to all the COVID-19 NCMAG-supported medicines due to the prescribing system setup. These findings illustrate that COVID-19 NCMAG advice has been impactful for service, clinicians and patients across cancer services in Scotland during the pandemic. A 'business as usual' NCMAG has now been established in Scotland to provide advice to support equitable access to safe, clinical and cost-effective off-label and off-patent uses of cancer medicines and improve patient outcomes.[2]

Table 1. Usage data calculated from the advice issue date to 31 October 2021.

		Number of patients		
Interim medicine	Indication	Region ID	Predicted number	Actual number
Abiraterone acetate with prednisone/prednisolone (abiraterone combination)	Newly diagnosed low-risk metastatic hormone-sensitive prostate cancer	**1**	180	169
Ibrutinib	Previously untreated chronic lymphocytic leukaemia	**3**	8	14
Pembrolizumab	Microsatellite instability-high/mismatch repair deficient metastatic colorectal cancer	**1**	18	22
		2	9	8
		3	4	12
Pembrolizumab and axitinib (pembrolizumab combination)	First-line treatment of intermediate and poor-risk advanced renal cell carcinoma	**1**	10	80
		2	7	35
		3	0	2

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Abstract 55
Type: Poster
Category: Service Development/Improvement

Use of adjuvant bisphosphonates in early breast cancer

A national UK survey describing the experience of oncology pharmacists

E Theodoulou, N Masters, I Holen and J Brown

Background: International and UK National guidelines for the management of Early Breast Cancer (EBC) recommend the use of adjuvant bisphosphonates (BPs) in postmenopausal women (natural or induced) to reduce the risk of recurrence and improve survival.[1–8] In the UK, adjuvant BPs were introduced in 2015 when Sheffield Teaching Hospitals' guidelines were shared nationally by the UK Breast Cancer Group (UKBCG). In 2018, NICE included them in its recommendations for the management of EBC,[7] providing a real opportunity to follow their implementation journey in the UK breast cancer practise. We recently published a physicians' survey showing that almost all of the responding UK oncologists prescribe adjuvant BPs for EBC.[9] As pharmacists are closely and actively involved in dispensing adjuvant BPs prescriptions, their experience was evaluated in a follow-up survey, with the aim to confirm the continued use of these agents in postmenopausal EBC patients in the UK.

Methods: An electronic anonymous survey was disseminated via e-mail to the members of the British Oncology Pharmacy Association (BOPA). The survey aimed to gather data on pharmacists' experience of the use of adjuvant BPs within their local NHS hospital. Questions were focused on clarifying the use of adjuvant BPs in the UK, identifying the most frequently used intravenous and oral agents and also understanding the prescribing process for oral adjuvant BPs.

Results: Between November 2021 and December 2021, 42 pharmacists from 35 UK centres replied to the survey. Four responses were received from non-UK oncology pharmacists and therefore were excluded from the final analysis. Overall, 93% of the participants reported the use of adjuvant BPs in their local NHS hospital. The majority of the responders (69%) indicated that they use them for both postmenopausal and premenopausal women with ovarian suppression with EBC, whilst 45% used them only for postmenopausal women. The most frequently prescribed adjuvant BP was intravenous zoledronic acid (64% only zoledronic acid, 7% zoledronic acid when receiving intravenous anticancer treatment then switch to oral and 12% both of these options) which is preferred over the oral ibandronate (48%). For the oncology centres which offer oral agents, the majority of the prescriptions are initiated by the oncologists who then pass the adjuvant BPs care to the general practitioners (GP) (33%). Oncology pharmacists are responsible for the oral bisphosphonates' prescription in 7% of the NHS oncology centres.

Conclusion: This national pharmacists' survey has confirmed that most of the UK Oncology Centres have implemented the use of adjuvant BPs in their management of EBC, showing that adjuvant BPs are now the standard of care in EBC in the UK. Despite the COVID pandemic and the need to switch from intravenous to oral treatment to reduce hospital attendance, intravenous zoledronic acid is still the most used adjuvant BP.

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Abstract 56
Type: Poster
Category: Service Development/Improvement

Evaluation of the multi-disciplinary roles supporting DPYD testing for patients receiving fluoropyrimidine systemic anti-cancer therapy (SACT) across the UK

Nisha Shaunak, Jessica Keen, Anna Kim, Simone Gelinas, Vinodh Kumar, Azara Janmohamed, Fionnuala Green, Sophie Harding, Jennifer Laskey, Munir Pirmohamed, William Newman and Paul Ross

Background: Seven Genomic Medicines Service Alliances (GMSAs) have been established to deliver equitable patient access and embed genomics into routine care across England.[1]

Fluoropyrimidine SACT is frequently used for many cancers and metabolised by dihydropyrimidine dehydrogenase (DPD). *DPYD* gene variants can cause DPD deficiency, potentially leading to severe toxicity. In November 2020, NHSE/I recommended testing all patients for *DPYD* polymorphisms prior to the commencement of fluoropyrimidine SACT.[2]

As part of a national transformation project, led by the South East and North West GMSAs, a baseline survey was undertaken in June 2021 to gain an understanding of *DPYD* testing pathways. The invitation was extended across the UK to Scotland, Wales and Northern Ireland to obtain a national overview.

Objective: To understand:

- Degree of *DPYD* testing across the UK
- Personnel & process involved in requesting, following up and actioning the result within the *DPYD* pathway.

Methodology
- South East GMSA collated data using SurveyMonkey as a data collection tool, on behalf of the National DPYD Oversight Group, as part of a wider baseline survey.
- Following piloting the survey on four Trusts, the survey link was emailed to all Cancer Lead Clinicians, via the organisational Medical Director and Chief Pharmacist (or equivalent for home nations).

Results: 220/222 (99%) organisations contacted across England, responded to the survey. 105 organisations confirmed they did not deliver fluoropyrimidine SACT; two organisations did not respond and were excluded from the analysis. 138 organisations (115 England, 23 home nations) confirmed delivery of fluoropyrimidine SACT and completed the full survey.

100% of organisations reported testing for *DPYD*, but not always all tumour types – the main tumour sites tested were breast, colorectal and upper-GI.

Within England, 87% organisations reported sending tests to a Genomic Laboratory Hub (GLH). The average UK turn-around time from sampling to reporting was $\leq$ 5 days for 42/138 (36%) and $\geq$ 6 days for the remaining organisations.

69% of UK organisations reported following UKCB Guidelines for dose adjustments.[3] 75/138 organisations delayed treatment until the result was reported and 60/138 organisations reported going ahead for the first cycle, according to local guidelines, if urgent.

Discussion: *DPYD* testing has been widely implemented across the UK but not always equitably for all tumour sites.

Tests are mainly requested by the consultant/registrar at the time of prescribing – this is not always the individual checking the result. In many organisations, *DPYD* result is checked by the screening pharmacist/SACT nurse/independent prescriber.

For identified variants, dose adjustments are primarily made by the consultant/registrar; the screening pharmacist/independent prescriber may also dose adjust.

Screening pharmacists play a pivotal role to ensure patients' *DPYD* results are followed up and subsequent treatment is appropriately dosed. Follow-up of unavailable results is driven by the consultant/registrar/screening pharmacist.

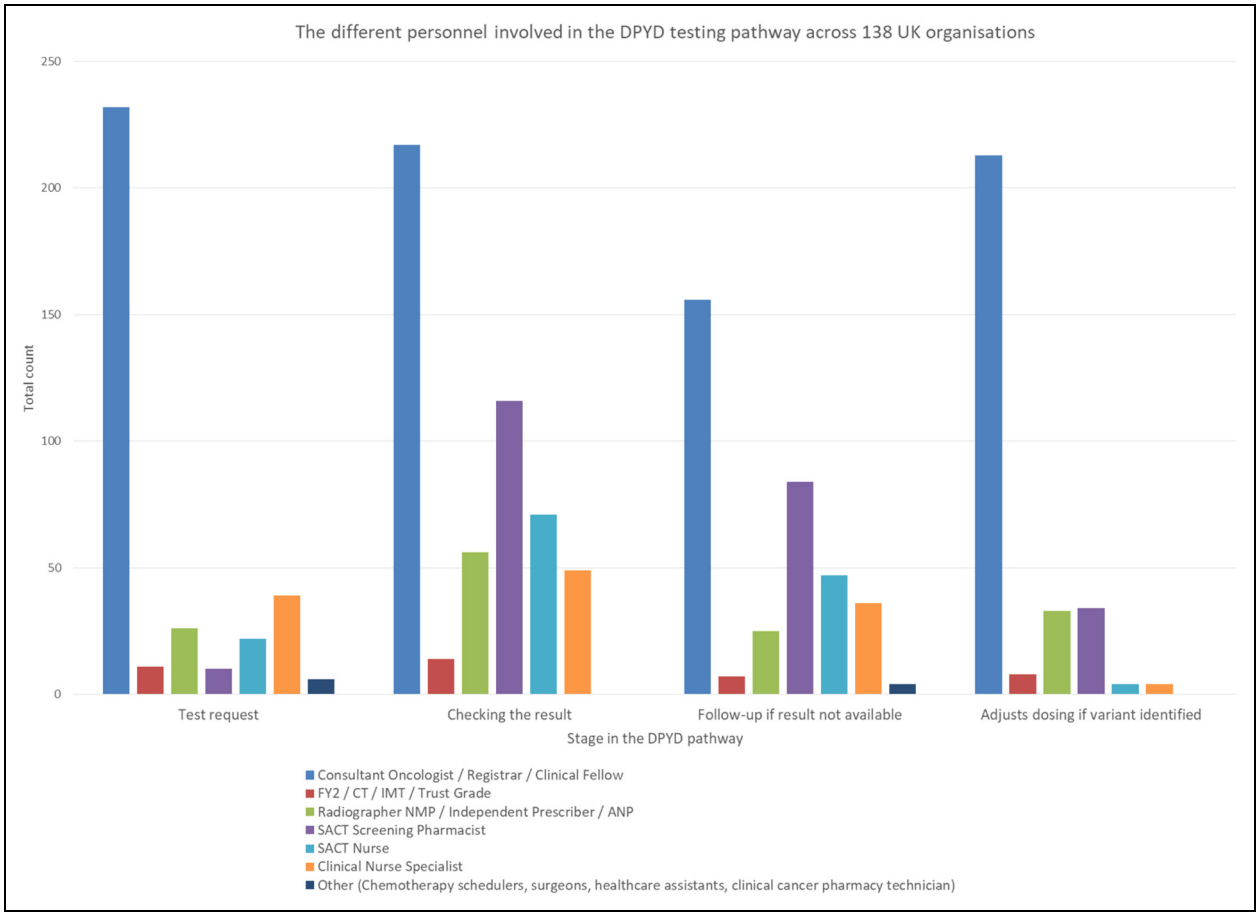

Figure 1. The personnel involved at different stages of *DPYD* testing.

Next steps

- Improve local awareness to ensure equitable *DPYD* testing across all tumour types for fluoropyrimidine SACT, including chemo-radiation.
- Local collaboration with GMSA/GLHs to optimise pathways for *DPYD* testing.
- Develop a gold standard pathway and update national guidance accordingly.

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Abstract 57
Type: Poster
Category: Service Development/Improvement

Impact assessing the future anticipated ATMPs delivery in a large non-CAR-T Cancer Centre.

Satvinder Mahal and Nisha Shaunak

Background: Advanced Therapy Medicinal Products (ATMPs) are a new class of medicines derived from genes, cells or tissues.[1] ATMPs have the potential to cure/stop further progression of difficult-to-treat diseases/ where no or little alternatives are otherwise available.[1]

A good example is Chimeric Antigen Receptor T-cell (CAR-T) therapies; these are well established and are delivered in specific NHSE-commissioned CAR-T centres.[1]

There are a number of non-CAR-T therapies in the pipeline (e.g. somatic cell therapies) which are expected to be evaluated by NICE.[1,3] These ATMPs span several indications and will require Cancer Centres to be prepared to deliver treatments. The Specialist Pharmacy Service (SPS) has published a series of documents to support centres for institutional readiness.[2–5]

Aim & objectives

1. To impact assess the ATMP pipeline to be evaluated by NICE over the next 3 years.
2. To evaluate current resource and infrastructure requirements to deliver the anticipated ATMPs for cancer in a non-CAR-T Cancer Centre.

Method: The pipeline ATMP data was obtained from the NHSE/I ATMP Horizon Scanning document.[1]

For the impact assessment, each ATMP was reviewed in terms of type, indication, expected launch, preparation requirements, storage, administration, pre-treatments and dosing/follow-up. With key clinical leads, the likelihood of potential uptake for each ATMP and the anticipated numbers at GSTFT was obtained.

The SPS documents were used to evaluate the current capability and the preparation, delivery and workforce requirements for institutional readiness.[2–5]

Results: Figure 1 shows the impact assessment of pipeline products.[1]

Discussion: 47 pipeline ATMPs are due to be assessed by NICE in the next 3 years, nine of which are for cancer treatment.[1]

In terms of delivery and space, the estate infrastructure has been reviewed to ensure adequate storage (vapour phase nitrogen facilities, freezers, and utilising cryroshippers) and dedicated ATMP pharmacy aseptic facilities are available to meet future demands.

With the potential of all nine ATMPs to be used locally (plus others for non-cancer indications) and given the complexity, the evaluation recognised a need for a governance structure for oversight and reviewing resource requirements.

A dedicated multi-disciplinary (MDT) ATMP Working Group has been set up, acting as an expert panel on behalf of the Drug & Therapeutic Committee to support the safe introduction/implementation of all ATMPs. Currently, this group reports directly to the Pharmacy Directorate Management Team and the Trust Board for assurance. The group has developed a process pathway and application form to introduce future ATMPs locally.

From a regulatory perspective, a Quality Manager has been recruited to lead obtaining JACIE accreditation (a requirement for cellular ATMPs[3]).

ATMP Name	Type	Indication	Est. Launch	Est no. pts/yr. UK (GSTFT)	Storage	Administration	Pre-treatments/ additional treatments	No. of treatment doses	Follow-up
Canpuldencel-T (DCVax-L)	Autologous Somatic Cell	Newly diagnosed glioblastoma	2023	230 to 1,000 **(10 to 20)**	Supplied in cryoshipper, stored by Cell Therapy Lab	Intradermal Injection	None	Approx. 10 doses	Day unit
Tabelecleucel (Ebvallo)	Allogeneic Somatic Cell	Post-transplant lymphoproliferative disorder	2023	20 **(1 to 2)**	Supplied cryofrozen, stored by Cell Therapy Lab	IV Infusion	Unknown	3+ doses	Day unit
Lifileucel (Contego)	Autologous Somatic Cell	Malignant melanoma	2023/4	55-285 **(6)**	Supplied cryofrozen, stored by Cell Therapy Lab	IV Infusion	Lymphodepletion + Interleukin-2	Single dose	10 days In-patient
Afamitresgene autoleucel	Cell Based (ex-vivo)	Sarcoma	2024	TBC	TBC	Infusion	TBC	TBC	TBC
Nadofaragene firadenovec (Adstiladrin)	Viral Based (in-vivo)	Bladder cancer	2024	25 to 46 **(1 to 2)**	TBC	Intravesical Infusion	Anticholinergic treatment	Up to 4 doses	In-patient
Letetresgene autoleucel	Cell Based (ex-vivo)	Solid tumours	2024	TBC	TBC	Infusion	TBC	TBC	TBC
Bizalimogene ralaplasmid	Viral Based (in-vivo)	Cervical dysplasia	2024	TBC	TBC	Intramuscular Injection	TBC	TBC	TBC
Autologous dendritic cell vaccine (MesoPher)	Autologous Somatic Cell	Mesothelioma	2024	TBC	TBC	Intradermal Injection	TBC	TBC	TBC
Sitoiganap (Gliovac)	Somatic Cell	Recurrent glioblastoma	2025	150 **(4 to 6)**	Supplied frozen (-80°C), stored by Cell Therapy Lab	Intradermal Injection	Oral cyclophosphamide + Bevacizumab	5 doses	1 to 2 days In-patient

Key (preparation requirements):
Ready to administer
Likely to be Ready to administer
By Cell Therapy Labs
By Pharmacy Aseptics (non-replicating viruses)
Ward level (short expiry)

Figure 1. Impact assessment of pipeline products.[1]

Workforce numbers/skill mix is being reviewed and a training plan is being set up (locally and with Kings College London).

Shared learning from current ATMPs (e.g. Zolgensma® and investigational ATMPs) at GSTFT is being used to future-proof service delivery.

Conclusion: This assessment has recognised several challenges to future-proof the delivery of ATMPs. This learning can be translated to other non-CAR-T Cancer Centres. As new ATMPs come onto the horizon, Cancer Centres will need to collaborate at an integrated care system (ICS) level to ensure efficient ATMP delivery.

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Abstract 58
Type: Poster
Category: Service Development/Improvement

Improving efficiency and reducing waste in the IV chemotherapy pathway from pharmacy to patient through the switch to ready-to-administer infusions

Hei Wan Wendy Ng, Dr Vikash Dodhia, Rebecca Devine and Sarah James

Objective: With the rising drug cost, the NHS drug spending soared to £18.2 billion in 2017/2018 and the 'The Future of Pharmacy Aseptic Services in England' review found that of the existing 649 installed workstations, 402 will need to be replaced. Utilising ready-to-administer bags of cytotoxic treatment can reduce waste and

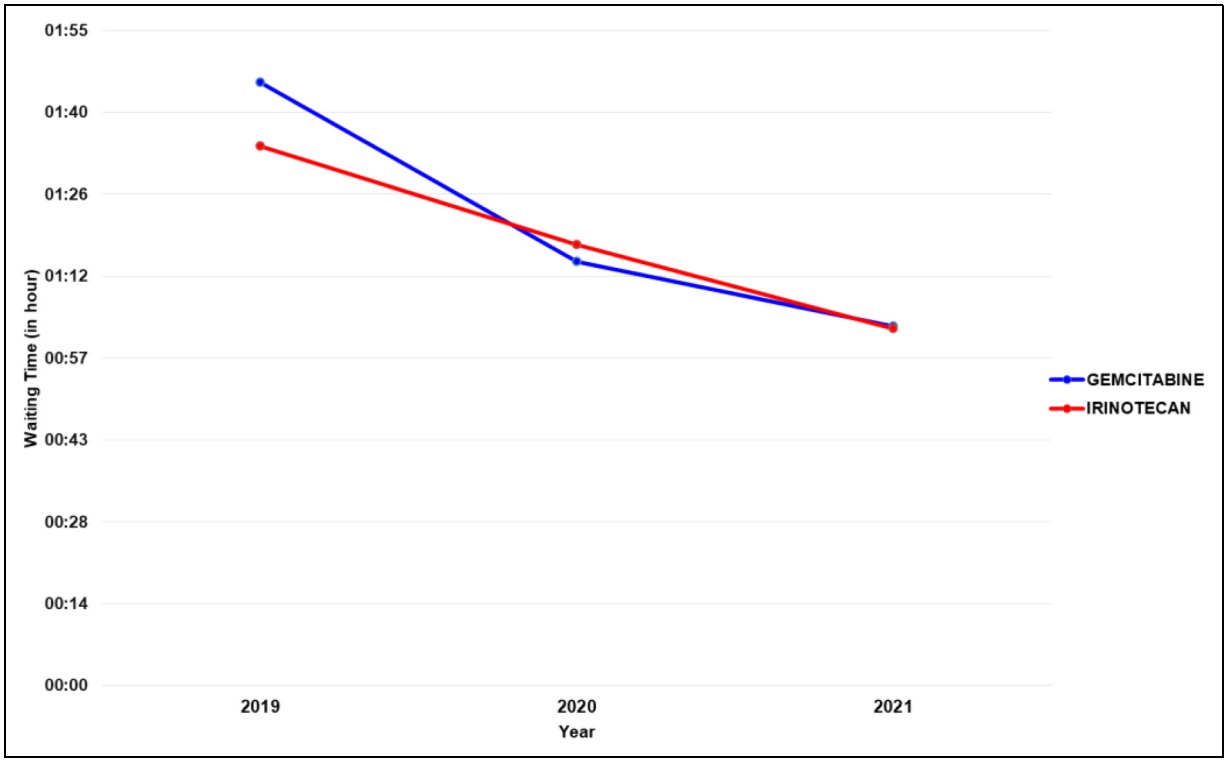

Figure 1. Chart to Show The Reduction in Patient Waiting Time Post-implementation of The Ready-To-Administer Irinotecan and Gemcitabine Infusions.

improve the current chemotherapy supply chains to be more agile, leaner and resilient to drug shortages thereby creating better value for the taxpayers' money.

Implementation of dose banding tables provides an opportunity to move away from bespoke products and enable the use of batch and ready-to-administer chemotherapy drugs. The primary drivers of this are cost reduction in waste and resilience in the chemotherapy supply chain.

Methods: A retrospective analysis of gemcitabine and irinotecan procurement and wastage data over a 30-months period was used to compare unlicensed chemotherapy batch versus ready-to-administer doses for cost, waste and patient waiting time in the day units.

Results: A total of 1802 dose units of Gemcitabine and 1355 dose units of Irinotecan were administered between January 2019 and June 2021. Ready-to-administer gemcitabine infusion was implemented in October 2019 with a gradual increase from 31% of total doses to an average of 82.5% per month. Irinotecan ready-to-administer infusion was implemented in March 2021 with a gradual increase from 21.5% to 64.3%.

Patient waiting times on average shortened by 32 min post-implementation.

A reduction of 63.8% and 67% in the value of gemcitabine and irinotecan wasted through the introduction of ready-to-administer products was observed. However, as the products do not cover all dose ranges, batch doses were still in use for 1300 mg and 1500 mg gemcitabine. Additionally, an average monthly saving of £1400 was observed on drug costs of ready-to-administer doses versus batch doses.

Conclusion: Aseptic compounding is currently the biggest challenge facing the delivery of chemotherapy treatments and organisations within the NHS need to make the most efficient use of the limited capacity. This study shows that implementation of licensed ready-to-administer doses reduces waste through increased shelf life, reduces costs and improves the availability of doses for patients.

Abstract 59
Type: Poster
Category: Service Development/Improvement

Cardiac monitoring in patients receiving Osimertinib

Meera Pankhania and Clare Geoghegan

Introduction: Osimertinib is a tyrosine kinase inhibitor (TKI) of epidermal growth factor (EGFR) used to treat non-small cell lung cancer (NSCLC) harbouring an EGFR mutation. The frequency of adverse-event cardiac dysfunction is rare (< 1%), but serious. Periodic monitoring with electrocardiograms (ECGs) and electrolytes should be conducted in patients with congestive heart failure (CHF), electrolyte abnormalities, or those taking drugs that prolong QTc interval. Anecdotally, there was variation in cardiac monitoring between patients, where some believed that monitoring was not required.

Aim: Evaluate the need for baseline and subsequent ECGs in patients receiving Osimertinib.

Objectives

- To examine the variation in cardiac monitoring in a cohort of patients receiving Osimertinib (Doctor vs non-medical prescriber).
- To quantify the percentage of patients with known risk factors – QTc drugs, CHF, electrolyte disturbances.
- To explore if any ECG changes caused any modifications to treatment.

Method: 38 consecutive patients who received cycle 1 Osimertinib from 1 June 2021 to 1 June 2022 at University College London Hospital were identified on the electronic medical record system. Data on ECGs, electrolyte disturbances, prior cardiac failure history and concomitant drugs that prolong QTc from the time Osimertinib was started, was extracted.

Outcomes collected were continued therapy with monitoring, change of concomitant medication, and treatment delayed or discontinued.

Results: Table 1 shows four out of 38 (11%) patients experienced a cardiac-related adverse event. Prolonged QTc occurred 2 to 6 months after commencing Osimertinib.

Hyponatraemia and concomitant QTc prolonging medication were the biggest risk factors for cardiac events. Not all patients taking concomitant QTc prolonging medication recorded abnormal ECGs or showed electrolyte disturbances.

Discussion: All prescribers were aware of the need for ECG monitoring. This work highlights the need for drug history taking as those with concomitant QTc medication require more tailored monitoring.

A prolonged QTc interval can lead to a potentially fatal outcome due to ventricular tachycardia and torsade de pointes. Subsequent monitoring from baseline was not

Table 1. Patients with known risk factors and outcomes.

Parameter	Number of patients	Percentage of patients (n = 38)	Outcomes
Hyperkalaemia	3	8%	100% continued therapy with monitoring 0% chance of concomitant medication 0% treatment delayed 0% treatment discontinued
Hypokalaemia	1	3%	100% continued therapy with monitoring 0% chance of concomitant medication 0% treatment delayed 0% treatment discontinued
Hyponatraemia	9	24%	67% continued therapy with monitoring 11% chance of concomitant medication 11% treatment delayed 11% of treatment discontinued
Hypocalcaemia	2	5%	100% continued therapy with monitoring 0% chance of concomitant medication 0% treatment delayed 0% treatment discontinued
Prolonged QTc	4	11%	25% continued therapy with monitoring 25% chance of concomitant medication 25% treatment delayed 25% of treatment discontinued
Heart failure	1	3%	0% continued therapy with monitoring 0% chance of concomitant medication 0% treatment delayed 100% treatment discontinued
Concomitant QTc prolonging drugs	11	29%	82% continued therapy with monitoring 9% chance of concomitant medication 9% treatment delayed 0% treatment discontinued

consistent, however, patients who experience prolonged QTc readings were monitored more regularly.

Patients who experienced a cardiac-related adverse event had no underlying cardiac disease and the aetiology of Osimertinib cardiotoxicity is unclear. QTc returned to the normal following a temporary hold of Osimertinib, however with the risk of rapid symptomatic disease flare or progression. It would be preferable for concomitant medication to be switched rather than TKI treatment withheld, a task that pharmacists already have the skills and knowledge to optimise.

One limitation of this evaluation is that the sample size is small and only from one hospital, yet these findings and the need for switching QTc prolonging drugs are relevant to many and should be adapted as part of pharmacist verification.

Conclusion: Patients receiving Osimertinib should continue to be monitored for cardiotoxicity given the high rate of morbidity and mortality associated with these complications, including a baseline ECG and review of concomitant drugs that prolong QTc. Regular monitoring for all patients should occur for the first 6 months, thereafter frequency can be assessed on an individual basis. Pharmacist training in managing and advising of concomitant medication is required.

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Abstract 61
Type: Poster
Category: Service Development/Improvement

Safety of obinutuzumab rapid infusion in chronic lymphocytic leukaemia (CLL): A retrospective single-centre evaluation

Nisha Thakrar and Raakhee Shah

Background: Obinutuzumab, an anti-CD20 monoclonal antibody, is indicated for the treatment of chronic lymphocytic leukaemia (CLL) and follicular lymphoma (FL). In CLL it is administered initially at a fixed rate and then at increasing variable rates with subsequent infusions as highlighted in Table 1.[1] In FL rapid infusion over 90 min is licensed if no Grade 3 infusion-related reaction (IRR) occurred during cycle 1.[1]

The CLL11 trial demonstrated the highest risk of IRR in CLL patients occurred with the first 1000 mg obinutuzumab dose (65% all grades) and decreases significantly with second (3% Grades 1 and 2) and third or subsequent doses (1% Grades 1 and 2).[1] This supports the tolerability of rapid infusion in CLL from cycle 2 (i.e. following four infusions).

At our centre rapid infusion was introduced from cycle 2 for CLL in the absence of an IRR to the preceding dose in order to alleviate daycare capacity pressure, reduce chair time and improve the patient experience.

Aim/objective: To retrospectively evaluate the safety and incidence of IRRs with Obinutuzumab rapid infusion in CLL patients at our centre over an 18-month period.

Method: Retrospective data were collected from our electronic prescribing system and medical notes. CLL patients who completed a minimum of two cycles of obinutuzumab from December 2020 to May 2022 were identified. Infusion rate and IRR incidence were recorded from the medical notes and infusion proformas. IRR was graded using Common Terminology Criteria for Adverse Events Version 5[2] and verified by a clinician independently.

Results/discussion: Eighteen patients completed a minimum of two cycles of Obinutuzumab during our audit period. Following the first 100 mg infusion, four patients (22%) had a Grade 3 IRR, 13 patients (72%) had a Grade 1-2 IRR, and one patient had no IRR. With subsequent infusions, only one Grade 1 IRR occurred with the second (900 mg) and third (1000 mg) infusions, and none with the fourth infusion (1000 mg). Hence, all 18 patients were eligible for rapid infusion from cycle 2. A total of 75 subsequent infusions were administered during the audit period, of which 49 were given at a rapid rate with the remainder at a standard rate. No IRRs were observed in those who received rapid infusion.

One limitation of this audit was that rapid infusion was inconsistently administered from cycle 2 due to poor nursing awareness of this protocol.

Conclusion: As a pilot in a single centre, rapid infusion of obinutuzumab can be administered safely in CLL patients from Cycle 2 in the absence of an IRR to the preceding dose. Our findings suggest that rapid infusion could be commenced earlier in the treatment protocol based on the low incidence of IRRs observed following the initial infusion. Increasing nursing awareness of the rapid infusion protocol is essential to optimise uptake and benefits.

Table 1. Obinutuzumab standard and rapid infusion protocol.

Cycle	Dose	Infusion rate	Estimated administration time (min)
Cycle 1 Day 1	100 mg	25 mg/h fixed rate	240
Cycle 1 Day 2	900 mg	Commence at 50 mg/h*. The rate can be escalated in increments of 50 mg/h every 30-min to a maximum of 400 mg/h. *If an IRR occurred during the previous infusion, commence at 25 mg/h. The rate can be escalated in increments of up to 50 mg/h every 30-min to a maximum of 400 mg/h	240
Cycle 1 Day 8 & Day 15	1000 mg	Commence at 100 mg/h*. The rate can be escalated in increments of 100 mg/h every 30-min to a maximum of 400 mg/h.	195
Cycles 2–6 Standard rate		*If an IRR occurred during the previous infusion, commence at 50 mg/h. The rate can be escalated in increments of 50 mg/h every 30-min to a maximum of 400 mg/h	
Cycles 2–6 Rapid infusion protocol		If no IRR during the proceeding infusion, administered at 100 mg/h for 30 min, then at 900 mg/h for 60 min	90

With wider adoption of rapid infusion in this setting, a multi-centre audit would be beneficial to consolidate the findings from this audit. This is also important if patients are receiving their first cycle in larger centres with subsequent infusions given at local centres.

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Abstract 62
Type: Poster
Category: Service Development/Improvement

A review of pharmacists' NMP-led clinics/NMP services within cancer services

Chan T, Nicola S, Musa R and Nurgat Z

Introduction: Nurses and pharmacists have had the opportunity to become non-medical independent prescribers (NMPs) since 2007[1] and often work with consultants to prescribe systemic anticancer treatment (SACT) and supportive therapies following appropriate assessments and management reviews.[2] NMP development depends largely on local needs, funding, staff availability and support from clinicians and the multidisciplinary team (MDT).[3] A network-wide understanding of Pharmacists' NMP services is essential to plan the future requirements for cancer workforces and education and training.

Aims & objectives: The aim was to understand the structure of the Pharmacist NMP workforce and the existing NMP models in clinics, inpatient or day cases across TVCA.

Method: The NMP workforce and clinical commitments were benchmarked against specific criteria. Data on the NMP workforce, areas of work, model of NMP-led clinic operations, and the type of SACT prescribing involved were collected using an agreed data collection form.

NMP workforce data was collected for:

- No. of qualified and practising NMPs within cancer
- Minimum years of experience in cancer for practising as an NMP
- Presence of scope of practice for NMPs
- No. of years of experience as an NMP in cancer
- Areas in which NMPs practice within the trust

NMP clinical commitments data was collected for:

- Details of NMP-led clinics/services
- Years since establishment
- NMP's role in the clinic
- Areas of prescribing

Data excluded: NMP services within palliative care; the actual time spent performing NMP duties on day cases/wards and clinics in development.

Results: See Table 1.

According to Table 1, there is a wide variation in the clinical commitments of NMPs across TVCAs, as well as the clinical areas that they cover. The Oxford University Hospital (OUH) has been operating NMP clinics for the longest, covering seven disease areas. Three out of four TVCA trusts had NMPs involved in breast clinics, reviewing patients and/or prescribing SACTs. Besides clinic reviews, NMPs also provided ad hoc prescribing in day therapy units and inpatient wards to support medical staff.

Discussion & conclusion: A minimum of two years of the cancer experience is a good practice, but it limits planning for the NMP cancer workforce. To facilitate this, clinical pharmacists should develop their confidence in undertaking consultations and decision-making earlier in their career, as well as the need to meet continual professional development (CPD) requirements as NMPs in their field. Trainees should also have nationally recognised NMP competency in cancer and SACT.[4] Additionally, NMP expansion within NHS Trusts is constrained by the clinical commitments of the existing workforce, requiring additional investment and funding from the MDT.[5] This funding can be successfully obtained from skill-mixing NMPs within an MDT when there are vacant oncologist posts.

In our efforts to build a cancer workforce model that includes NMPs alongside medical and nursing professionals, the merit of NMP-led clinics will also be

Table 1. Data collected on the Pharmacist NMP workforce within the TVCA Trust's Cancer Services and their NMP clinical commitments.

TVCA Trusts	Pharmacist NMP numbers				AfC Banding			Years of experience as NMP in Haem/Onc			Practising area (Narratives)			Operation of NMP Services/ NMP-led clinics								NMP's role in clinic			Other information	
	No. of qualified Pharmacist NMPs in cancer	Min years of experience in cancer for practising as NMP	Trust scope of practice / local SOP (Y/N)	No. of trust Pharmacist NMPs prescribing within cancer services	Band 7	Band 8a	Band 8b+	0 to 1	1 to 3	3 +	DTU	IP	NMP working in haem/onc clinic	Haem/onc clinic type	No. of WTE per week	Parallel clinic with consultant	Operation of NMP clinic	Length of clinic	Length per review	Type of clinic (F2F / Tele)	Years of implementing NMP clinic	Pt review + Prescribing SACT + supports	Pt review + Prescribing supports	Pt review only	Type of SACTs involved	Limitation
GWH	1	2	Y	1			1			1	1 (Over-lapping)		1	Breast (CDK Clinic)	0.1	N	Patients referred to clinic by consultants for blood monitoring and review. Review patients independently unless there are concerns.	3.5hrs	30mins	F2F or Telemed. Majority telemed.	1.5			Y	CDK + AI	Excluded Palliative care prescribing included Pharmacist NMP only
														Myeloma	0.1	Y	Consult consultants prior to, during, or after clinics	3hours	30mins	F2F or Telemed. Majority telemed.	3.5	Y			Any SACT Oral and IV	
MKUH	3	2	N	3	0	2	1		1	2	0.1-0.2	0.1		Day unit	0.2	N	Ad hoc - first cycles patients are seen by pharmacist, prescribe supportive care if required/ missing	variable	variable	F2F	3		Y		Supports only	Business case in place for NMP clinics in Iron Infusion, MPN and Breast, The model would be stand alone clinics rater than parallel clinic with the consultant. Currently only prescribing supportive care on the day without any formal clinics.
														Inpatient	0.1	Y	Discussed with MDT before prescribing	variable	variable	F2F	3		Y		Supports on inpatient ward	
RBH	2 (+ 1 on mat leave)	2	Y	2		2	1	1 (+1 on mat leave)		1	2 (over-lapping)		2 (over-lapping)	Breast	0.2	N	Patients referred to clinic by consultants for blood monitoring and review. Review patients independently unless there are concerns.	3.5 hours	20mins	Both	1	Y			CDK4 capecitabine	Admin time spread across the week for RBH
														Urology	0.1	Y	Review patients with clinician before and affter clinic /consult consultants during clinics	3 hours	15mins	Both	1	Y			Abi, Enza, IV chemo	
														Breast	0.1	Y	Review patients with clinician before and affter clinic /consult consultants during clinics	3 hours	15mins	Both	3	Y			Neoadjuvant/adjuvant/m etastatic IV and oral	
OUH	15	2	Y	13	1	9	3	2	4	7	All qualified Pharm can practice in DTU ad hoc if improves patient care and efficiency	All qualified pharm can practice on wards ad hoc if improves patient care and efficiency	9	Uro-oncology (prostate)	0.2	Y	Consult consultants prior to, during, or after clinics	5 hours x 2	30mins	F2F or Telemed. Majority telemed.	8	Y			Any SACT Oral and IV	3 x band 7 in training in 2022/23 No extra admin time allocated
														Melanoma	0.1	Y	Consult consultants prior to, during, or after clinics	3.5 hours	30mins	Telemed	2	Y			Any mainly oral SACT	
														Myeloma	0.2	Y	Review patients with clinician before and affter clinic /consult consultants during clinics	5-6 hours x 2	30mins	Telemed	6 & 2	Y			Any SACT Oral and IV	
														Breast	0.2	Y	Consult consultants prior to, during, or after clinics	4.5 hours x 2	30mins	F2F or Telemed. Majority telemed.	8	Y			Any SACT Oral and IV	
														Colorectal	0.1	Y	Consult consultants prior to, during, or after clinics	4.5 hours	30mins	F2F or Telemed. Majority telemed.	8	Y			Any SACT Oral and IV	
														Sarcoma	0.1	Y	Consult consultants prior to, during, or after clinics	4.5 hours	30mins	Both	1 month	Y			Any SACT Oral and IV	
														CLL	0.1	Y	Consult consultants prior to, during, or after clinics	4 hours	30mins	Both	2	Y			Any SACT Oral and IV	

demonstrated through a piece of research that investigates patient satisfaction and staff evaluation. Additionally, it is necessary to re-evaluate all NMPs within TVCA to determine their impact on workforce planning and cancer patient care.

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Abstract 63
Type: Poster
Category: Service Development/Improvement

Implementation and evaluation of new high-cost drugs (HCDs) reports to successfully comply with the cancer drug fund (CDF) price check validation (PCV) at Darent Valley Hospital (DVH)

Clayton Wong

Introduction: In the 2019/20 financial year, PCV was introduced as an audit to confirm the expenditure of CDF meets the standard set out in the CDF policy.[1] In the 2021/22 financial year, PCV became mandatory as a condition of usage of CDF for all NHS providers.

In September 2021 (M6), communication was sent from CDF to providers outlining the ongoing issues with data submission to the CDF. CDF warned if submission quality did not improve, reimbursement might be denied at the end of the year. DVH was one of the providers that experienced issues with data submission. A working group of pharmacy, income team and business intelligence were formed to tackle the issues.

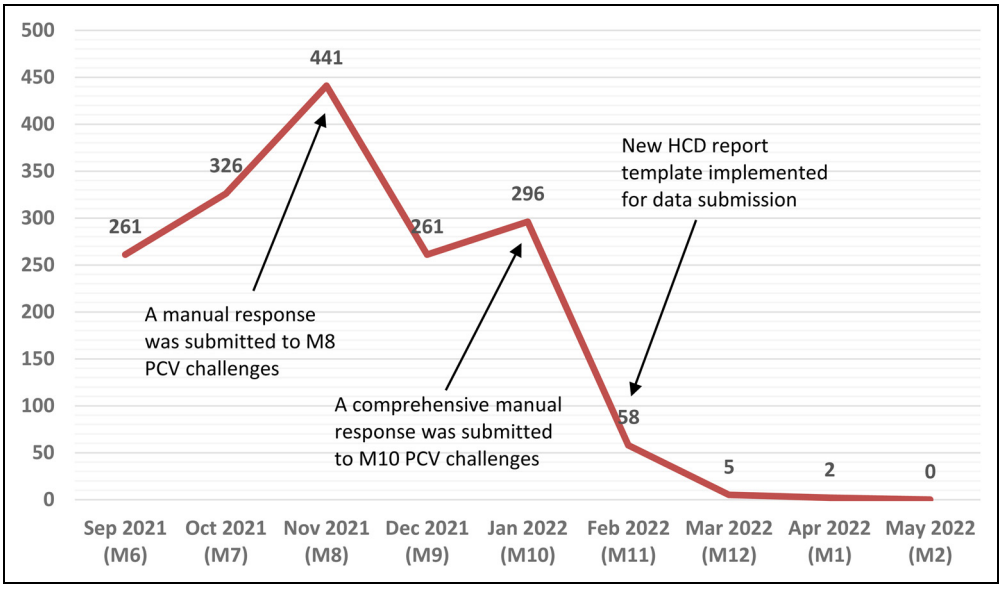

Figure 1. PCV challenges received from CDF from September 2021 to May 2022. A manual response was submitted at M8 to reduce cumulative challenges; a comprehensive manual response was submitted at M10 to resolve all remaining challenges, as a new HCD report template was introduced at M11.

Objectives: The aim was to ensure CDF data submissions meet the standard set out for PCV.

The main objectives are to:

- Ensure reimbursement from CDF
- Minimise PCV challenges

Methods: At M6, the Trust had cumulated 261 challenges, and the amount in dispute was £575,000 for the financial year to date.

Upon reviewing existing challenges, the following issues were identified in previous submissions:

- Data formats did not meet CDF PCV report specification.[2]
- Drugs recharged to incorrect commissioners.
- PAS prices unavailable for compounded drugs.
- On-costs charged to CDF.

An initial action to manage the increasing number of challenges was a manual response to all cumulated challenges for M8 (November 2021) to CDF, as the amount-in-dispute reached over £1,000,000.

The working group decided to create a crystal report template for all future HCD submissions. Several features would be implemented in the new template that would mitigate the issues identified:

- Data formats were programmed to follow CDF PCV report specification guidance.[2]
- An alert would arise if HCD might be funded by different commissioners.
- PAS prices were programmed into the reports, including compounded drugs.
- On-costs and drug costs were programmed to be separated automatically.

Configuration of the new template was completed, and the first report was implemented for submission for M11 (February 2022). Another manual response to M10 (January 2022) PCV challenges was also submitted to resolve all remaining challenges to date.

Results: Impact of manual responses and new reports were evaluated by number of PCV challenges from M6 2021/22 (September 2021) to M2 2022/23 (May 2022) (Figure 1).

At M10, the amount-in-dispute from CDF PCV was £838,000. The comprehensive manual response successfully reduced the cumulative challenges for M1–10 from 296 to 39, and the amount-in-dispute to £114,000. The new HCD report for M11 resulted in 19 new challenges. All 58 challenges were due to manual errors. The number of cumulative challenges reduced significantly since the implementation of the new report. In the following 3 months, PCV returned 5, 2 and 0 challenges.

All challenges from 2021/22 were resolved at the end of the financial year, and CDF agreed to reimburse the full amount to the trust.

Discussion: The response at M10 successfully resolved most of the challenges. However, manual response to challenges was a time-consuming process and considered to be inefficient. The new HCD template provided an effective solution. Reports were generated with automation, complied with data submission standards and minimised PCV challenges.

Abbreviations: HCD: High-Cost Drugs; CDF: Cancer Drug Fund; PCV: Price Check Validation; DVH: Darent Valley Hospital.

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Abstract 64
Type: Poster
Category: Service Development/Improvement

Use of apixaban prophylaxis in myeloma patients treated with immunomodulatory drugs (IMiDs): A multi-trust approach

Rosaria Aiello

Introduction: Myeloma patients treated with immunomodulatory drugs (IMiDs) are at high risk of both arterial and venous thrombosis. VTE risk is common to IMiD (thalidomide, lenalidomide and pomalidomide) monotherapy but increases with the addition of steroids to the regimen. Current guidelines recommend risk-adapted thromboprophylaxis with aspirin, LMWH or warfarin. However, data from the UK Myeloma XI study found 11.8% of patients experienced thromboembolism, most of which took the recommended thromboprophylaxis. DOACs are promising due to their convenience but also increasing data supporting their use in myeloma. Storrar et al., 2019 reviewed their practice by comparing historical data from patients with myeloma receiving conventional VTE prophylaxis with those who received apixaban 2.5 mg twice a day. Their data support the introduction of apixaban in this setting with only one episode of major bleeding (pre-existing thrombocytopenia) out of 70 patients on apixaban and no reported incidents of VTE with two cases of arterial thrombosis. Another group (Cornell et al., 2020) looked at 50 patients using apixaban 2.5 mg for 6 months when starting IMiDs. They found no VTE and three episodes of clinically relevant non-major bleeding (6%). Both Trusts have adopted the use of apixaban prophylaxis since 2019 but formal guidelines have yet to be developed. The aim of this service improvement project is to gather local real-world data to support the change in practice.

Methods: Using Aria we searched for all patients that had been prescribed thalidomide, lenalidomide or pomalidomide with apixaban. We reviewed the electronic notes and letters and results system to check if there was a history of thrombosis or bleeding whilst on apixaban.

Results: In total 81 patients were identified between February 2019 to May 2022. Of these nine were taking pomalidomide, six were thalidomide and 66 were lenalidomide. Pomalidomide (nine patients, 59 cycles) and thalidomide (nine patients, 47 cycles): there were no episodes of bleeding or VTE. Lenalidomide: Only three patients out of 66 experienced clinically relevant non-major bleeding or clot. One patient was on third-line IRD and had an above-knee DVT on enoxaparin. This patient had significant bruising whilst on treatment dose apixaban for VTE. The platelets count at the time was 32. The patient was reduced to a prophylactic dose of apixaban but had ongoing easy bruising. The second patient had a history of atrial fibrillation and diabetes. They had a minor cerebellar infarction. Third patient minor GI bleed. In total patients received 459 cycles of lenalidomide.

Discussion: Although our data is limited in number it reflects our local population and current practice. There is a need to continually monitor outcome data with the proposed changes in practice along with the development of audit criteria. Development of guidelines and audits must take into account co-morbidity, which has not been studied in this work, as this will influence not only individual patient risk but may further influence the choice of thromboprophylaxis.

Conclusion: Our experience to date would support the ongoing use of apixaban as thromboprophylaxis with IMiDs.

Table 1. Summary of the patients when lenalidomide and apixaban were initially used together.

Trust	First line	Second line	Third line	Maintenance
HHFT	Nine patients: 41 cycles in total	21 patients: 129 cycles in total	10 patients: 122 cycles in total	Nine patients: 70 cycles in total
SFT	Three patients: 35 cycles in total	None	10 patients: 126 cycles in total	Four patients: 96 cycles in total[a]

[a]One patient had 75 cycles, started apixaban after 35 cycles and followed a PE on LWMH post-surgery.

Abstract 65
Type: Poster
Category: Service Development/Improvement

Subcutaneous (S/C) systemic anticancer therapy (SACT) closer-to-home patient interest survey within South East London Cancer Alliance (SELCA)

Lilia So, Llywelyn CadmanDavies, Catherine Oakley and Nisha Shaunak

Acknowledgement

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Aishling McLoughlin, Catherine Quinlan, Georgie Pelser, Janet Hayden and Nicholas Liew.

Background: The NHS Five Year Forward View,[1] a Model of Care for Cancer Services[2] and the NHS Long-Term Plan[3] lay down the vision to provide more personalised and care closer to home. The COVID pandemic has expedited the need to develop a model of care which enables patients to access treatments without attending the hospitals and to improve the capacity of Cancer Day Units to meet the ever-increasing demand. The development of the S/C route has revolutionised the complexity of intravenous SACT administration.

Kings Health Partners' conducted a Phase I project on patient self-administration of S/C bortezomib during 2020, all eight patients recruited and stakeholders highly rated and would recommend this service, it was both safe, convenient and effective for patients and staff, resulting in the collaboration of Guy's and St Thomas' Hospital (GSTT), King's College Hospital (KCH) and Lewisham & Greenwich Trust (LGT) to explore patients' appetite for this service in South East London.

Objectives

- To explore patient interest in self-administration of certain S/C SACT at home
- To understand the type of supportive material patients/carers find useful to facilitate with SACT self-administration
- To identify alternative SACT treatment delivery outside the hospital setting

Method

- A baseline patient interest survey on self-administration was produced and submitted to patient groups at each site for comments prior to distribution.
- Patients on S/C Bortezomib, Denosumab, Goserelin, Phesgo and Trastuzumab to complete, were surveyed between 8 and 25 February 2022.

Results: Table 1 shows the results from the patient survey.

Discussions: There was no difference between medications and the likelihood of self-administration. 36% of surveyed patients were interested in this care model. The main deterrents were a lack of confidence in their ability to self-administer, needle phobia, concerns of reduced contact with healthcare professionals (HCP), did not see the need for change due to satisfaction with the current system, and English language being a barrier. Patients who were neutral may become interested if they received and had access to information and support. This would help build confidence, and increased the likelihood of adherence to self-administration.

Although the majority of surveyed patients had a travel time of < 1 h, there were some patients travelling much longer, and/or requiring additional support to attend hospital appointments.

Overall patients were interested in self-administration, and there was enthusiasm for SACT delivery at local GP practice/healthcare centres and treatment buses. These options provide an alternative for those unable to self-administer.

Conclusion: There is an appetite for self-administration of SACT. This empowers patients to have more control over their treatment, and reduce waiting times and the need to travel to the hospital. Supportive material and phone call with HCP is crucial to patients' confidence in the service and their ability. It should be noted service design ensures equitable patient access. Alternative treatment delivery models are available, however, given shortages in nursing staff, self-administration would enable simpler S/C therapies to be given in the community.

Next steps

- Move on to the next stage of self-administration pathway development.
- Create self-administration training packs, and review current videos available on self-administration.
- Continue dialog with the Patient Engagement group to build on the self-administration model design.

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Table 1. To show the Patient survey responses regarding patient self-administration.

Total respondents	47	Respondents
Total No. Treatments	49	2 Patients on 2 treatments
Likelihood of taking up self-administration after appropriate training and support material	21%	Extremely likely
	15%	Very likely
	30%	Neutral
	19%	Unlikely
	15%	Not interested at all
Frequency of CDU attendance (number of patients)	20	Weekly
	1	2 weekly
	17	3 weekly
	19	Monthly
*Supportive resources patients want (number of patients)	28	In person training session
	21	Video
	15	Patient information leaflet
	15	Phone call
*Treatment location preference (number of patients)	13	Continue in hospital setting
	13	Treatment bus
	21	Local GP surgery or Healthcare Centre
	19	Self-administration
	1	Unsure
Waiting times on CDU (number of patients)	9	0-15 minutes
	18	15-30 minutes
	17	30-60 minutes
	2	60+ minutes
	1	Don't know
Travel time to hospital (number of patients)	24	up to 30 mins
	15	30 mins - 1hr
	7	1-2 hrs
	1	2-3 hours

*Patient were able to select multiple options

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Abstract 66
Type: Poster
Category: Service Development/Improvement

Evaluation of the efficacy and tolerability of cidofovir for the treatment of BK virus infection post-allogeneic stem cell transplantation

Amjad Ali Khan and Nick Duncan

Introduction: Haemorrhagic cystitis (HC) is a relatively common complication after allogeneic stem cell transplantation (SCT). Early onset HC is usually caused by the direct effects of chemotherapy or radiotherapy on the bladder mucosa. Late onset HC is most commonly caused by the BK virus, has an incidence of 7%–25%,[1] and is associated with significant morbidity. Although debate exists as to the most appropriate treatment, encouraging results have been reported with cidofovir.[2] Although its long half-life allows for once-weekly dosing, it is associated with significant nephrotoxicity with a reported incidence of renal dysfunction of 25%–30%.[2,3] The aim of this study was to evaluate the real-world efficacy and tolerability of cidofovir in SCT patients with BK virus infection.

Methods: Electronic patient records at the Queen Elizabeth Hospital, Birmingham were used to collect data on all allogeneic SCT patients who received at least one dose of cidofovir for the treatment of symptomatic BK virus infection during a 3-year period (Feb 2018–Feb 2021). Key parameters included demographic details, dosing and duration of cidofovir, clinical and virological outcomes and renal function. Data were recorded using Microsoft Excel and descriptive statistical analyses were undertaken.

Results: 29 patients (median age: 48, range: 17–72) received cidofovir during the study period (27 male, two female). Six patients had concurrent cytomegalovirus (CMV) infection. The median time from transplant to development of symptomatic BK infection was 36 days (range: 2–820). The median starting dose of cidofovir was 5 mg/kg (range: 1.5–5 mg/kg) and the median number of doses received was 3 (range: 1–13). All patients received concomitant probenecid. In terms of efficacy (based on definitions from Bedi et al.[4]), a complete response (CR) was achieved in 25 patients (86.2), a partial response (PR) in three patients (10.3%) and clinical failure in one patient (3.5%). For those patients with serial viral load measurements, 89% demonstrated a $\geq$ 1 log reduction in urinary BK load and 52% demonstrated a $\geq$ 1 log reduction in blood BK load from baseline.

The median baseline creatinine in the cohort was 95 μmol/L (range: 39–214 μmol/L) and at the end of treatment, this had increased to 112 μmol/L (range: 44–327 μmol/L). Nine patients (31%) developed CTCAE grade 2 nephrotoxicity (> 1.5–3 fold increase in creatinine from baseline) and four patients (14%) stopped cidofovir due to nephrotoxicity although in three cases, they had achieved a clinical response prior to cessation. Dose adjustments for baseline renal function[5] were observed in 13 patients (45%). Further dose adjustments occurred for 12 patients: seven patients (24%) required a dose reduction due to worsening renal function and five patients (17%) had a dose increase due to improved renal parameters.

Discussion and conclusions: IV cidofovir was an effective treatment for BK virus infection after allogeneic SCT. The high response rates seen were comparable to previous work in this area.[2] Rates of nephrotoxicity were also similar to literature estimates[2,3] and it is noteworthy that 75% of patients in the study were receiving concomitant ciclosporin. The retrospective nature of the study made data collection challenging and future work in this area should focus on a prospective data set.

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Abstract 67
Type: Poster
Category: Service Development/Improvement

Patient self-administration of subcutaneous (S/C) systemic anti-cancer therapy (SACT) across South East London Cancer Alliance (SELCA)

Lilia So, Llywelyn CadmanDavies, Catherine Oakley and Nisha Shaunak

Background: SELCA consists of three cancer hospitals (Guy's and St Thomas' Hospital Trust (GSTT), King's College Hospital (KCH) and Lewisham & Greenwich Trust (LGT)), working in partnership across Southeast London.

In 2020, a small self-administration pilot for S/C bortezomib was undertaken at KCH. The learning was shared across SELCA, and a stakeholder engagement exercise was undertaken. This identified significant interests from patients and multi-disciplinary staff to extend the scope of SACT offered across a wider geography.

Objectives: To define a wider scope of SACT suitable for patient self-administration and phased implementation of a standardised patient self-administration pathway across SELCA.

Method: A multi-disciplinary project team was set up to critically evaluate and identify appropriate SACT drugs suitable for self-administration. This was risk assessed based on formulation, vesicant properties and allergy risk.

A clearly defined governance structure was established with oversight from the SELCA Project Board, Site leads and local Drug & Therapeutic Committees.

A standardised SELCA pathway & governance policies, nurse training packages, and drug-specific patient information leaflets (PILs) were developed prior to implementation. For the identified SACT scope, patient selection criteria incorporated equitable access to the service based on risk assessment and patient choice, from patient engagement sessions.

Local processes were mapped with service users and modified to deliver services safely.

A standardised collection tool, risk register and issues log were developed to evaluate data.

The project implementation phase was from 1 November 2021 to 30 June 2022.

		Projected patient number uptake per annum		
		KCH	GSTT	LGT
Phase I	Bortezomib	KCH only		
Phase II (All sites)	Denosumab	29	14	8
	Trastuzumab	22	16	8
	[1]*Bortezomib	38	13	17
	[1]*Cytarabine	4	uncertain	2
	**Goserelin	n/a	n/a	n/a
	**Leuprorelin	n/a	n/a	n/a
Phase III (All sites)	S/C Daratumumab			
	S/C Phesgo			
	S/C Rituximab			
	S/C Azacitidine			
	*IV Eribulin			
* Products are manufactured by licensed / unlicensed aseptic units				
** Products are CCG commissioned				
[1]Already in progress at KCH, yet to be implemented at GSTT & LGT				

Figure 1. Phased scope of risk assessed SACT and anticipated numbers, by SELCA site, based on activity data and patient feedback.

Results: From stakeholder engagement sessions, projected numbers were utilised to plan and implement service (see Figure 1).

Discussion: Phase II of the self-administration pathway has been successfully implemented and the learning is being shared on an ongoing basis across all SELCA sites. This model offers additional flexibility to suit patients and will continue to be used as an adjunct to SACT service delivery. The self-administration model also offers the additional capacity to support future demand.

There are several considerations in the implementation of a self-administration model including:

- *Stakeholder engagement* – Staff and patients were keen to extend this delivery model with additional support, training, and follow-up phone calls. Video material developed with Guys Cancer Academy supplemented written information and QR code. Any off-label SACT usage was explicitly highlighted.
- *Drug expiry challenges* – Supply of SACT under Section 10 exemption[1] offers limited expiry dates on manufactured products. The availability of dose-banded SACT offers extended expiry dates and a more flexible solution. Additionally, the viability to courier medication directly to patients in certain cases may be postulated where appropriate cold chain supply can be guaranteed.
- *Governance* – Clear roles/responsibilities for overarching governance both at the local and SELCA level, for appropriate reporting, oversight, escalation and audit.
- *IT infrastructure* - Site-specific virtual locations were set up for recording activity and scheduling.

Next steps

- To fully evaluate service in 6 months.
- Scope and implement further phases of SACT for self-administration.
- Further develop alternative models of closer-to-home care.

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Abstract 68
Type: Poster
Category: Service Development/Improvement

Latex content of cytotoxic drugs and monoclonal antibodies prepared in the aseptic unit

Louisa Knowles and Erika Maculevica

Introduction: Natural latex contains allergenic proteins which can cause hypersensitive immune responses.[1,2] This ranges from mild local cutaneous reactions to life-threatening anaphylaxis and death.[3] The severity of symptoms depends on the individual's susceptibility and the route of exposure, with parenterally administered products posing the greatest risk.[3] Vials with stoppers containing latex risk the allergenic proteins leaching into the aqueous preparation.[3]

Aim: To identify whether products prepared in the aseptic unit contain latex or latex derivatives.

Objectives

- To review the SPC for all cytotoxic drugs and monoclonal antibodies prepared in the aseptic unit, to identify products containing latex or latex derivatives
- To contact the manufacturer for all cytotoxic drugs and monoclonal antibodies prepared in the aseptic unit, to identify products containing latex or latex derivatives

Method: A list was obtained of all the cytotoxic drugs and monoclonal antibodies prepared in the aseptic unit. Every product's SPC was checked for information on its latex and latex derivative content. The manufacturers were contacted via their medicines information sources to confirm the latex and latex derivative content status of the product. The information provided by the SPC and manufacturer were compared.

Results

Discussion/conclusion: Most manufacturers avoid latex and latex derivatives in their products as the most appropriate safety precaution. A small number of manufacturers, however, still use natural dry rubber as a component in the vial stoppers. This refers to hardened sheets of Hevea latex, with much fewer latex proteins making the final product much less antigenic.[2,3] However, it is not known whether trace amounts of latex from latex-containing vial stoppers can cause allergic reactions in latex-sensitive patients.[2]

To improve practice and patient safety, the following actions will be implemented:

1. All products must be assessed for latex/latex derivative content prior to preparation in the aseptic unit
2. For products that may contain latex or a latex derivative, the following must be added to the label: 'May contain latex or latex derivatives'
3. The allergy status of patients must be assessed at the new patient assessment by the nurses and at the clinical screening by the clinical pharmacist

Table 1. Summary of products containing latex derivatives.

Drug name	Brand name	Manufacturer	Latex content (SPC)	Latex content (manufacturer feedback)
Carboplatin	N/A	Hospira UK Ltd	Yes (vial stopper)	Yes (dry natural rubber, a derivative)
Carboplatin	N/A	Accord Healthcare Ltd	Yes (vial stopper)	Yes (dry natural rubber, a derivative)
Etoposide	Toposar	Pfizer	Yes (vial stopper)	Yes (dry natural rubber, a derivative)
Vinblastine	N/A	Hospira UK Ltd	Yes (vial stopper)	Yes (dry natural rubber, a derivative)
Vincristine	N/A	Hospira UK Ltd	Yes (vial stopper)	Yes (dry natural rubber, a derivative)

4. The pharmacovigilance process for investigating adverse reactions must be updated to include the assessment of the latex and latex derivative content of the products administered
5. Staff training on the importance of assessing the latex and latex derivative content must be implemented
6. Commercial units need to be approached, to ensure they have a process for identifying products that potentially contain latex or latex derivatives and be requested to add this to their labels.
7. Regional procurement needs to be contacted to ensure they are aware that some products contain latex and latex derivatives and request that the assessment of this is incorporated into their tendering process for regional contracts. Products that may contain latex or latex derivatives should be avoided where possible.

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Abstract 69
Type: Poster
Category: Service Development/Improvement

A pharmacist-led clinic for oral therapies in metastatic breast cancer: Joint working project and beyond

Mark Pearce

Objectives: A novel pharmacist-led clinic was established for metastatic breast cancer patients at a chemotherapy outreach site in July 2018 in anticipation of significant increases in treatment options and clinic workload. The pharmacist reviews and prescribes treatment for this patient cohort and works within the MDT to support patients. This project was established as a joint working project with a pharmaceutical company.

- Measure the changes including the number of pharmacist reviews, the size of the patient cohort and the number of cycles of SACT prescribed from July 2018 to April 2022.
- Measure the pharmacist contribution to the prescribing for patients treated for MBC from July 2018 to May 2022.
- Measure the changes in prescribing patterns for MBC patients from July 2018 to May 2022.

Method: Retrospective data collection from the e-notes system for the period 1 July 2018 to 31 May 2022 measuring pharmacist clinic appointments since the start of the project.

'Snapshot' data collection using e-prescribing system July–August 2018 and March–April 2022 to assess changes in the volume of SACT, regimens prescribed and pharmacist prescribing at the outreach site.

Discussion

- Total number of telephone reviews (July 2018-April 2022): 1384
- Total number of clinic reviews (July 2018-April 2022): 376
- Average monthly reviews have increased (332%), and the method of review shifted toward the telephone.

Year	Average monthly telephone reviews	Average monthly clinic reviews
2018	8.2	4
2020	29.6	7.1
2022	50	2.75

- The number of patients receiving SACT increased significantly (83%) from 54 to 99 and the average number of cycles received increased by 51% from 2018 to 2022.

- Significant increases have been seen in the volume of oral chemotherapy regimens (120%) and targeted plus hormone therapy (324%) while IV chemotherapy and HER2-directed therapies remained similar. The number of distinct SACT regimens prescribed increased from 13 to 21.
- Pharmacist prescribing contribution increased (by 50%) from 30% to 45% of the total volume at the outreach site.

Conclusion: The pharmacist led clinic has shown a significant and sustained contribution since the project started in 2018. Following the completion of the joint working project, ongoing funding was secured from the NHS Trust.

The pharmacist prescriber has been able to support the MDT with not only patient reviews but also additional prescribing workload associated with access to new and increasingly effective therapies.

The joint working project has proved to be a successful model for the implementation of a novel model of care, to proactively manage a rapidly expanding patient cohort.

Analysis shows a net growth in appointments but also a shift towards telephone review which was driven by the COVID-19 pandemic. Prescribing patterns shift towards targeted therapies driven by new approvals, the pandemic and increased pharmacist resources supporting access to novel therapies. The complexity of patient treatment has also increased with the increasing number of therapies available.

Limitations This is that the non-prescribing contribution of pharmacists isn't captured in the data collection and prescribing data is only measured only as a snap-shot which may not accurately reflect the full-time period.

Abstract 70
Type: Poster
Category: Service Development / Improvement

The successful business case for additional adult cancer clinical pharmacy staff

Nicky Stringer, Susan Thomson and Isabel Roberts

Introduction: University Hospitals of North Midlands NHS Trust (UHNM) is a designated cancer centre – the main site based at Royal Stoke University Hospital (RSUH), 26 day-case chairs, 40 oncology/haematology in-patient ward, and a satellite 16 chair day-case unit at County Hospital. Clinical pharmacy service is provided at both sites supported by the MHRA Manufacturer's 'Specials' Licensed unit and clinical trials team at the RSUH site. There had been no investment in the Pharmacy Cancer Clinical Service (PCCS) since 2015 despite increasing patient SACT workload, new regimens and treatment complexity. The PCCS current staffing is 10.16wte including pharmacists, technicians and support workers – this excludes all prescribing, manufacturing, clinical trials, cancer electronic prescribing and administration system management, paediatric cancer and clinical information roles that are funded separately.

Aims and objectives: The aim was to benchmark UHNM PCCS utilising various sources to establish the gap in the workforce with the objective of developing a successful business case for additional staffing to support the current service.

Methods: The PCCS staffing was benchmarked against:

British Oncology Pharmacy Association (BOPA) – Chemotherapy Service Specification – Medicines Optimisation, Safety and Clinical Pharmacy Workforce Plan January 2015[1]

The NHS Benchmarking Network Data Collection Specification for Pharmacy and Medicines Optimisation 2020-21 was reviewed for pharmacy staff time spent on oncology/haematology per 1000 cycles administered.[2]

Results: NHS Benchmarking Data 2020 for UHNM PCCS pharmacy staff time spent on oncology/haematology per 1000 cycles administered was only at 57% of the mean staffing level in other English NHS Trusts.[2]

UHNM PCCS staffing and workload were used to calculate the workforce recommendations as per the BOPA Chemotherapy Service Specification.[1]

See table for analysis.

The gap analysis identified the additional six staff equating to £305,915.

1.0wte Band 8a Pharmacist

2.5wte Band 7 Pharmacist

1.5wte Band 5 Medicines Management Technicians (MMT)

1.0wte Band 3 Medicines Management Assistant (MMA)

Both methods reinforced the need for a business case which was developed by the pharmacy and submitted to the trust for the six posts identified in the analysis as per trust policy.

Standard	Workforce Recommendations and additional rationale / considerations	UHNM patients	Current UHNM staff allocation	UHNM staffing requirement	Current capacity on establishment
Prescription verification of SACT must be undertaken by an accredited pharmacist in accordance with the BOPA verification standards	Minimum of 1.2 WTE faculty level 1 oncology trained pharmacist per 30 ambulatory oncology or per 25 haematology prescriptions	150 per day across both sites Split oncology 70% haematology 30%	3.05 wte Pharmacists across both sites	**5.3wte Pharmacists across both sites**	**Pharmacist 57% capacity**
Clinical Pharmacy services to inpatient oncology/haematology beds must be provided by an oncology trained pharmacist, accredited in the verification of SACT	Minimum of 1.2 WTE oncology trained pharmacists per 25 inpatient oncology beds. Minimum of 1.2 WTE oncology trained pharmacists per 15 inpatient level II-IV haematology beds	20 inpatient oncology beds 20 inpatient haematology beds 4 EAU beds – assume oncology	1.5wte Pharmacists across service	0.96 wte 1.6 wte 0.19 wte **Total 2.75 wte Pharmacist**	**Pharmacists 55% capacity**
	Additionally there should be sufficient Pharmacy technical staff to perform supporting roles. They are an important resource for optimising clinical pharmacist activity e.g. by supporting medicines reconciliation.	MMT for 40 beds = 1 wte MMA for 40 beds and out-patient areas = 1.0 wte 1.5 wte ACT Band 5 to support final checking of SACT across sites	0.5wte MMT 0.0wte MMA 1.0wte MMT (newly appointed)	**1.0wte MMT Band 5** **1.0wte MMA Band 3** **1.5 wte ACT Band 5**	**MMT 50% capacity** **MMA 0% capacity** **ACT 66% capacity**
Patients commencing on a programme of anti-cancer medicine should have their medicines reconciled by an accredited pharmacy professional.	Minimum of 1.2 WTE oncology accredited pharmacy technicians per 30 chemotherapy attendances / day* *to include education for patients commencing oral anti-cancer agents where pharmacy provide this service This workforce plan incorporates medicines reconciliation at cycle 1 of a new treatment programme and patient education on the use of oral anticancer agents and supportive medications.	Currently this service is only provided for in-patient SACT **No out-patient service** 210 new patients per month across sites = 12 patients /day	zero	**0.5 wte MMT Band 5**	**No service currently**
Patients commencing on a programme of care with an oral anti-cancer agent should receive patient education and counselling on the use of their medicines from an accredited pharmacy professional or nurse.	This role could alternatively be undertaken by an oncology pharmacist in low volume or remote chemotherapy services; however in most instances use of an accredited pharmacy technician would represent a more efficient use of skill mix and resources.	Patient medication education and counselling carried out by nurse at UHNM			**Continue with nurse led service**

Discussion/conclusion: The NHS Benchmarking data[2] and BOPA Chemotherapy Service Specification[1] proved to be useful tools for supporting the successful business case. This BOPA document is currently being reviewed as a work stream by BOPA with the aim to develop a national workforce capacity and planning tool.[3]

To date five of the six posts have been recruited with training in progress. The remaining Band 7 Pharmacist post is being reviewed for an alternative role to support the service. Key Performance Indicators from the business case are being tracked with the pharmacy reporting back to the Trust Executive Team scheduled for October 2022.

The trust acknowledges that this investment only supported current activity in January 2022. It is predicted that demand for SACT will increase by 30% following the COVID-19 pandemic. As such a further business case for an additional four oncologists and all supporting staff, including the pharmacy, is currently being reviewed by the trust. The Trust recognises the key

role Pharmacy provides to the safe and efficient delivery of SACT services and are willing to invest in them.

Keywords: Business case, chemotherapy service specification, benchmarking

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Abstract 71
Type: Poster
Category: Service Development/Improvement

Empowering pharmacy technicians to embrace a more advanced role in cancer care

Gemma Barron, Dr Vikash Dodhia, Wendy Ng, Rebecca Devine and Madhavi Govindaraj

Objective: At Mount Vernon Cancer centre we have expanded the pharmacy technician role beyond traditional dispensing activities to include advanced or specialised tasks such as medication history taking, counselling, and the day-to-day management of the electronic prescribing system. The objective was to explore the views of pharmacy technicians on their expanding role.

Methods: A focus group was held with five pharmacy technicians. The open discussion explored job satisfaction and how the technicians felt about their roles and responsibilities. Information collected from the focus group was analysed according to themes.

Results: The main themes identified during the focus group included job satisfaction, job design, communication and education and training. The technicians were motivated by recognition, responsibility, achievement, a stimulating work environment and the possibility of advancement. These factors increased job satisfaction. All technicians were keen to undertake further education and training opportunities, particularly the Medicines Management for Pharmacy Technicians Course. All the rotational pharmacy technicians enjoyed the rotational element of their role. Whilst all rotational technicians enjoyed the variety of their roles, patient-facing roles were the most popular. The least popular role was one where training gaps were identified and one where they felt undervalued on occasion. Technicians also wanted increased communication and more recognition. The results of the focus group reflected the Herzberg motivation–hygiene theory. The motivating factors have been listed previously and the hygiene factors identified include company policy/administration, good interpersonal relationships, and quality of supervision and work conditions. Herzberg found that when motivating factors were in place it resulted in a commitment to the job, high satisfaction and high motivation and this was reflected in our focus group discussion. Hygiene factors were less instrumental in increasing job satisfaction but did prevent dissatisfaction.

Conclusion: Technicians had higher levels of job satisfaction when they received recognition, responsibility and achievement in a stimulating work environment with the possibility of advancement. The enhanced roles offered a stimulating work environment, empowerment and opportunities for advancement. Recognition and training were identified as areas for improvement. Motivational factors played a big role in job satisfaction and ultimately performance.

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Abstract 72

Type: Poster

Category: Service Development/Improvement

Evaluation of monitoring of patients on tyrosine kinase inhibitors for lung cancer treatment at Royal United Hospital, Bath

George Hallam-Evans, Aaron Cordeiro and Vicki Portingale

Background/introduction: Tyrosine kinase inhibitors (TKIs) are a type of targeted anti-cancer therapy that block the action of tyrosine kinase enzymes that play a role in cell signalling, growth and division. TKIs are used to treat various malignancies including lung cancer. New TKIs are constantly being developed and approved for use in lung cancer. Currently, these include **alectinib, brigatinib, ceritinib, gefitinib, lorlatinib**, **osimertinib and sotorasib**. Monitoring

requirements for these TKIs vary. Lung cancer consultants at the Royal United Hospital have found these differences in monitoring requirements difficult to keep track of, and as a result, may have missed ordering some recommended investigations for some patients.

Aims/objectives: The main aim was to analyse and evaluate the monitoring data for patients on TKIs for lung cancer treatment over a 4-year period, and consider ideas to improve monitoring if appropriate.

Objectives

- Evaluate if the individual monitoring requirements have been met for patients on the specified TKIs (correct tests at correct time intervals).
- If needed, design a crib sheet for easy access to monitoring parameters for each of the TKIs based on Somerset, Wiltshire, Avon & Gloucestershire Cancer Alliance (SWAG) guidelines.
- Evaluate whether the introduction of the intervention crib sheet improves monitoring.

Methods: Using the Aria (e-prescribing) database and Millennium, data was collected on the monitoring of patients on specified lung TKIs from Oct 2017–Oct 2021. A Boolean table was created to ascertain whether monitoring was carried out in a timely manner.

Results: For the majority of patients, most required monitoring was carried out in a timely manner. However, only eight out of 22 patients were found to have all of their monitoring carried out perfectly.

Less common monitoring requirements, for example, lipase, amylase and glucose – recommended for patients taking brigatinib and ceritinib, were often tests that were missed.

ECG was another monitoring parameter that was sometimes lacking. However, this may have been done but not uploaded to the patient's record.

Discussion: Contributory factors thought to lead to the lack of appropriate monitoring include:

- The heavy workload of oncology consultants – no time to look up each drug at each clinic visit
- New TKIs are continuously being approved for use in lung cancer, each with different monitoring requirements
- Review of patients by registrars who may not be familiar with the requirements

After discussion with the consultant, the production of a checklist of monitoring recommendations for each of the TKIs was considered to be the most helpful aide memoir for prescribers. This was devised, and also included the most common/unique toxicities of each TKI. A laminated copy is available in all clinic rooms.

Conclusion: The analysis confirmed the consultant's thoughts that not all monitoring is being carried out for lung TKIs. The monitoring sheet that has been produced will enable the lung cancer consultants to be able to quickly access information on monitoring and toxicities.

The document will need to be reviewed and updated regularly, and all lung prescribers should be made aware that it is available.

A re-audit should occur 12 months after implementation to see if monitoring has improved.

Abstract 73
Type: Poster
Category: Service Development/Improvement

Enhancing the role of registered pharmacy technicians through the expansion of the practice

Isabel Roberts, Nicky Stringer, Susan Thomson and Andrew Reeves

Introduction: University Hospitals of North Midlands NHS Trust (UHNM) is a designated cancer centre – 40 oncology/haematology in-patient beds at Royal Stoke University Hospital (RSUH), 42 day-case chairs across RSUH and County Hospital. Following the clinical screening of Systemic Anti-Cancer Therapy (SACT) prescriptions, the accuracy release of SACT is performed by authorised pharmacists at satellite dispensaries in cancer units.

At UHNM registered pharmacy technicians are able to perform the final accuracy check on all dispensed medications (except clinical trials) through the nationally accredited Pharmacy Accuracy Checking Technician (ACT qualification). Although this includes oral chemotherapy and injectable medicines (e.g. ampoules/vials for injection/reconstitution); SACT reconstituted by our MHRA Manufacturer's 'Specials' Licensed unit and commercial suppliers are excluded. Recognising the skills of the ACT and the experience of existing cancer pharmacy technicians, we hoped to expand their role through training to include accuracy release of all SACT within the cancer units, thus releasing clinical pharmacist time to undertake clinical screening; prescribing clinics; ward and clinical duties.

Aims and objectives: There is no national course or qualification and the aim was to develop an in-house training programme by:

- Recognising and utilising knowledge and experience of existing pharmacy cancer staff.
- Train and educate ACTs in cancer and SACT regimens.
- Ensuring safe practice – competency-based validations in dispensing and accuracy checking SACT.
- Approval Expansion of Practice by Divisional Governance and Chief Nurse.

Methods and results: Training package developed in modules (see Appendix 1) tailored to the experience and qualification of the registered pharmacy technician. For example:

- Nationally recognised ACT qualification.
- Releasing officer at UHNM licensed manufacturing unit.
- Extensive post-qualification experience – minimum of 2 years in a hospital pharmacy cancer setting. This group needed to complete the entire training package.

All staff are to complete competencies in line with dispensary ACT dispensing and checking competencies. Systemic Anti-Cancer Therapy (SACT) Competency Passport, UKONS was referenced as part of the clinical module.[1]

It was anticipated training would be completed within 6 months and revalidation every 2 years.

Discussions/conclusion: A Medicines Management Technician (MMT) was recruited in September 2021 and successfully completed the training package in November 2021. Subsequently, a pharmacy technician releasing officer has completed their training with a further two MMTs in training. Training has taken less than 3 months in practice.

This expansion of practice recognises the skills and experience of the registered pharmacy technician. Individuals have felt empowered in their roles and enhanced responsibilities and have increased job satisfaction. This expansion of practice has created a positive cultural change within the team for workforce development. Service continuity has improved and released pharmacist time to undertake other clinical duties.

This supports future clinical developments of the registered pharmacy technician, such as pre-assessment clinics and clinical triage.

Keywords: Expansion of practice, workforce, accuracy check, registered pharmacy technician

Reference

UKONS. Systemic Anti-Cancer Therapy (SACT) Competency Passport: Oral, intravenous, subcutaneous and intramuscular SACT administration for adult patients. v4; 2019 August

Appendix

Table A1. Training module for dispensing and accuracy checking SACT and supportive medicines in the UHNM pharmacy cancer units.

Module 1	Understanding SACT and how it is used to treat cancers
Module 2	Handling SACT (releasing officers exempt)
Module 3	Aseptic production, GMP and Knowledge of pharmacy technical services (releasing officers exempt)
Module 4	Using ARIA® MedOncology to dispense and accuracy check SACT and understanding IT systems used in the cancer centres
Module 5	Dispensing SACT competency activity
Module 6	The governance surrounding accuracy checking (ACT exempt)
Module 7	Accuracy checking SACT in the cancer centres competency training exercise
Module 8	Reassessment (not to be completed as part of the initial training pack)
Final assessment	Interview with the Deputy Clinical Director and Lead Cancer Pharmacist

Abstract 74
Type: Poster
Category: Service Development/Improvement

A review of the cisplatin hydration policy to standardise practice and prevent delayed discharge

Pride Mtetwa and Shabnam Sobhdam

Background: Cisplatin is a platinum-based antineoplastic agent that has been the foundation of treatment for various malignancies. One of the major side effects is nephrotoxicity, as cisplatin is primarily renally excreted where it can accumulate in the renal proximal tubules.[1] Hydration regimes are therefore key to preventing cisplatin-induced kidney injury. At the Royal Marsden (RM) patients on cisplatin are weighed before and after treatment to monitor for fluid overload, and a doctor is called if the weight threshold is breached for review. Historically there were two thresholds at RM, a lower threshold of 2 kg with the aim of driving diuresis and 4 kg with the aim of preventing fluid overload. Recent

Table 1. Changes made to Cisplatin- hydration protocol.

Patient weight gain	Actions
Greater or equal to 2kg	For oral furosemide 20mg stat (pre-built into the proforma for nurse administration)
Greater or equal to 4kg	For oral furosemide 20mg stat (pre-built into the proforma for nurse administration) and Referral for review by doctor

standardisation of the cisplatin-hydration protocol at RM set this threshold at 2 kg for all regimes for a doctor review.

The aim of this audit was to assess the standards set in the cisplatin-hydration protocol with a particular focus on the breach weight of 2 kg for medical action. The objective was to collect data across all outpatient cisplatin regimes and determine the average weight change along with the actions taken if the 2 kg threshold was reached. The current policy states that if patients gain more than 2 kg or are symptomatic with visible fluid overload, a doctor should be contacted to assess the patient and consider prescribing 20–40 furosemide PO/IV or 200 mL mannitol 10% IV.[2]

The secondary objective was to improve discharge times by assessing the medical action taken upon weight breach and implementing protocol change in tandem with the electronic prescribing rollout.

Methods: Patients assessed were from all three RM medical day unit (MDU) sites (Chelsea, Sutton and Kingston). Patients on cisplatin regimes were recruited upon treatment visits across a span of 3 months (Feb 2022 to May 2022). Data was collected by the MDU nurses using a pre-made data collection tool for which they were trained on using. For patients who gained more than 2 kg on treatment, the actions taken were recorded. In cases where the tool was not adequately completed, electronic medical notes were investigated for follow-up monitoring.

Discussion: A total of 86 patients treatments were audited, with 64 patients gaining more than 2 kg (74%). Of this 74%, 40% had no action documented, 45% were just monitored with no treatment and only 12.5% were treated with oral furosemide. No correlation was identified as to why treatment was given in some cases compared to others. It must be noted that mannitol was never used, which also reflects results from Santoso et al. and Dana et al. where the use of furosemide over mannitol was associated with less cisplatin nephrotoxicity and patient comfort.[3,4]

Conclusions: Discrepancies were found between current practice and hydration protocol. A large percentage of patients (45%) are only being monitored with no treatment. This causes unnecessary delayed discharges and keeps valuable MDU chairs occupied. There are evident variations in practice by doctors regarding the criteria to administer treatment or not. This supported the removal of mannitol from policy and changes seen in Table 1.

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Abstract 75
Type: Poster
Category: Service Development/Improvement

A service evaluation project using the British Committee for Standards in Haematology (BCSH) guideline for the use of bisphosphonate therapy in outpatients with myeloma at the Royal Hallamshire Hospital

Sarah White

Introduction: Current national guidelines recommend all patients with symptomatic or active myeloma are on bisphosphonate treatment, whether or not bone lesions are evident as per the British Committee for Standards in Haematology (BCSH) Guidelines 2010 and should continue for at least 2 years.

The Royal Hallamshire Hospital Haematology Day ward sees 50 patients per month for IV Bisphosphonate. As a result of patients attending without prescribed treatment, data on compliance with BCSH guidelines for use of bisphosphonate therapy in patients with myeloma was carried out.

The aim was to assess if the lack of a standardised pathway was contributing to poor prescribing and if the service would benefit from a separate Zometa clinic.

Objectives

1. Review of missed doses
2. If symptomatic patients had been prescribed Zometa
3. Review of incorrect dose for renal function
4. Zometa is not authorised within 48 h of the appointment date
5. The prescription not clinically checked
6. No record of a dental check before treatment.
7. If the patient can be discharged to another hospital
8. Received too much bisphosphonate
9. Calcium supplements prescribed as per local guidance
10. If blood had been requested
11. If blood had been reported the day before the appointment
12. If weight had been updated within 3 months for CrCL calculation

Method: Data was collected over a 4-week period from a total of 33 patients who had been booked on the day ward diary via the outpatient pathway for Zometa treatment on a weekend. Those who followed the day case unit or trials pathway were excluded from the data collection as they follow a different pathway.

The day ward diary was used to collect the sample size and identify subjects. This was then cross-referenced with the electronic prescribing system and diary to assess data for the objectives.

Results

1. 3% had missed a dose
2. 80% of patients with symptomatic myeloma are on bisphosphonate
3. 93.75% had the dose adjusted correctly for renal function
4. 0% were authorised more than 48 h after appointment date
5. 0% had a clinical check
6. 25% had received a dental check
7. 15% could be discharged to another hospital
8. 6% were overtreated
9. 61% had calcium supplements prescribed
10. 30% had weight updated within 3 months

Discussion: As a result of the baseline data which demonstrated targets not hitting 100% with the current system, a new Zometa clinic was developed to help streamline this process. This involved planning appointments, arranging blood, dental reviews, weight updates, and calcium supplements, documenting in the notes, and contacting patients. Data is being collected in real-time to show the impact of this service.

Conclusion: The data showed that the service could benefit from a more standardised approach to Zometa prescribing. Since setting up the Zometa clinic, the service has improved targets such as prevention of missed doses, amended Zometa frequency in line with ASCO guidance, dose reduction for renal function, reduced duplication of blood tests, the addition of calcium supplements and delaying treatment for dental work.

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Abstract 76
Type: Poster
Category: Service Development/Improvement

Patient experience of the pilot bortezomib self-administration service at University College London NHS Foundation Trust (UCLH)

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Background: University College London Hospital (UCLH) launched a pilot Bortezomib self-administration service in multiple myeloma patients. Patients or carer(s) were able to self-administer systemic anti-cancer therapy (SACT) in the comfort of the patient's home to improve their quality of life. Self-administration of SACT can reduce travel and waiting times for treatment, and impact to personal commitments for example work or childcare whilst receiving treatment. A Macmillan survey estimated an average cost of £170 a month in 70% of patients attending outpatient chemotherapy appointments.[1] These can cumulatively impact the quality of life, especially with bi-weekly or weekly regimens containing bortezomib. Furthermore, the introduction of the self-administration service should reduce chemotherapy unit pressures and aseptic workload by utilising outsourced SACT with an extended expiration. Patients were assessed for suitability for self-administration, consented to self-administration and trained during their first cycle of treatment. For subsequent cycles, patients attended daycare for the administration of their first dose and subsequent doses within the cycle were collected by or delivered to the patient. On self-administration treatment days, a trained nurse conducted telephone consultations to assess toxicity and ensure the safe administration of SACT.

Objectives: To evaluate the patient experience of all patients who had completed treatment on the pilot bortezomib self-administration service over 12 months.

Method: Patients enrolled in the self-administration programme between June 2021 and June 2022 were identified using Trust electronic prescribing system (Epic®). A senior nurse conducted telephone interviews with all patients who had completed treatment in July 2022. Five questions were asked using open and closed questions. Data were collected and analysed on Microsoft Excel with patient-identifiable information anonymised. Thematic analysis was used for qualitative analysis.

Results: During the audit period, 10 patients had completed treatment on the self-administration service. All patients were contactable and consented to telephone interviews. Qualitative themes identified from telephone interviews are listed in Table 1. All patients rated the self-administration service as either good or excellent. None of the patients preferred to revert to nurse-administered treatment. Self-administration at home was reported to be more comfortable and easier. Some patients reported saving in travel time and cost. In addition, the training instilled confidence in the patients to self-administer SACT and empowered them in their disease management. Telephone consultations on each self-administration treatment day were reassuring and provided safety at the start of treatment for all patients. Patients also reported that they were comfortable to voice concerns as the nurse would be able to help them should they run into issues. There are a few reported issues with SACT delivery, mainly delays in delivery or unknown delivery times which resulted in anxiety waiting to receive chemotherapy.

Table 1. Qualitative themes from telephone interviews for patients who had completed treatment on the pilot Bortezomib self-administration service.

Positive themes	Negative themes
Very good service	Medication delivered with delay
More comfortable to do at home	Not knowing when the courier will deliver – creating anxiety
Avoid frequent visits to Macmillan Cancer Centre	Anxious at the beginning when self-administering but this was overcome.
Save time	
Less intimidating	
Felt that they are taking ownership of their treatment and recovery	
Felt supported throughout their journey	

Conclusion: This evaluation provides a brief insight into our patient experience with the pilot bortezomib self-administration service. Overall patient's experience of bortezomib self-administration was positive. The delivery service should be audited to identify issues and trends, and to further improve the service if there are delays. A re-evaluation should occur as the service expands to more patients.

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Abstract 77
Type: Poster

Category: Service Development/Improvement

A service evaluation at the Singleton Hospital (Swansea Bay University Health Board); Swansea, UK to examine capacity use (chair and treatment time) for metastatic colorectal cancer patients (mCRC) treated with EGFR therapies and chemotherapy

Eleanor Lau and William Neill

Background: Panitumumab and cetuximab are monoclonal antibodies that target the EGFR (epithelial growth factor receptor) and are used in the treatment of metastatic colorectal cancer (mCRC) that over-express EGFR.[1]

The Singleton Hospital uses both agents with chemotherapy and oncologists within the centre may choose either agent. However, there are differences in infusion time, need for pre-medication and dosing schedule.[2] These differences affect the time that a patient occupies a treatment chair ('chair time') which then affects the number of patients that can be treated in a given clinic ('capacity').[2]

Objectives: To evaluate current capacity usage (chair time) for mCRC patients treated with targeted EGFR therapies in combination with chemotherapy, and to identify potential opportunities to increase capacity and inform decision-making.[3]

Method: Between January 2019 and December 2019, data were retrospectively collected from 20 electronic patient records. Patients were aged 18 and over, diagnosed with stage 4 mCRC with a RAS wild-type status and treated with at least two cycles of EGFR therapy in combination with chemotherapy. Patients received either, panitumumab (n = 4) or cetuximab (n = 16), in combination with folinic acid, fluorouracil and oxaliplatin (FOLFOX), or folinic acid, fluorouracil and irinotecan (FOLRIFI).

All treatments were prescribed based on the clinician's preference. For each patient, regimen and recorded chair time were collected. A comparison was made between the two agents in terms of the use of resources was conducted, in addition to an examination of allocated chair time versus recorded chair time.

Results: Across the study period, 14 cycles of panitumumab were delivered (mean cycles per patient: 3.5 ± 2.4) compared with 90 cycles of cetuximab (mean cycles per patient: 5.6 ± 2.2). Panitumumab was only combined with FOLFOX (n = 4 patients), whereas cetuximab was more frequently combined with FOLFIRI (n = 11 patients) compared with FOLFOX (n = 5 patients). It was estimated that if all patients following clinical assessment, received panitumumab, 135.0 h (or 16.9 chair days) could have been saved over the study period (8 h chair time available per day). Given the preference of combining panitumumab with FOLFOX[2–4] rather than FOLFIRI, only n = 5 patients who received cetuximab combined with FOLFOX would potentially have received panitumumab, and the potential time saving would be 36.0 h (or 4.5 chair days) over a total of 24 treatment cycles.

The total allocated chair time (816.0 h) was found to be 19% higher than the total recorded chair time (661.2 h), across the 104 cycles delivered during the study period. Moreover, panitumumab-based regimens had a greater difference between allocated chair time and recorded chair time, with total allocated chair time (105.0 h) being 24% greater than a total recorded chair (80.1 h) when compared with cetuximab. Total allocated chair time (711.0 h) for the cetuximab-based regimen was 18% greater than the total recorded chair time (581.1 h).

Conclusion: The results of this analysis suggest that a panitumumab-based regimen has potential savings in terms of chair time. Furthermore, the total recorded chair time was found to be 19% less than the total allocated chair time. Optimising both aspects of the treatment procedure has the potential to increase capacity and patient flow.

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Abstract 78
Type: Poster
Category: Service Development/Improvement

A service improvement project to reduce antibiotic use in cancer patients

Joseph Williams, Celia Noblett, Unell Riley, Firza Gronthoud and Gillian Kiely

Introduction: Infections are one of the most common complications of anti-cancer therapy and cancer patients rely on effective antibiotics to prevent and treat infections. 41% of UK oncologists saw a rise in drug-resistant infections in 2019 and 46% believe drug-resistant infections could make chemotherapy unviable.[1] Antibiotic exposure to bacteria and overuse of antibiotics contribute to antibiotic resistance.[2] The UK 5-year action plan for tackling antimicrobial resistance 2019–2024 has set the target to reduce antibiotic use by 15% by 2024.[2]

Objectives

1. To reduce antibiotic use (defined daily doses (DDD) per 1000 total admissions (inc. Day Cases)) in a cancer centre by 15% by 2024.
2. To identify interventions that reduce antibiotic use (DDD per 1000 total admissions (inc. Day Cases)) in cancer patients.

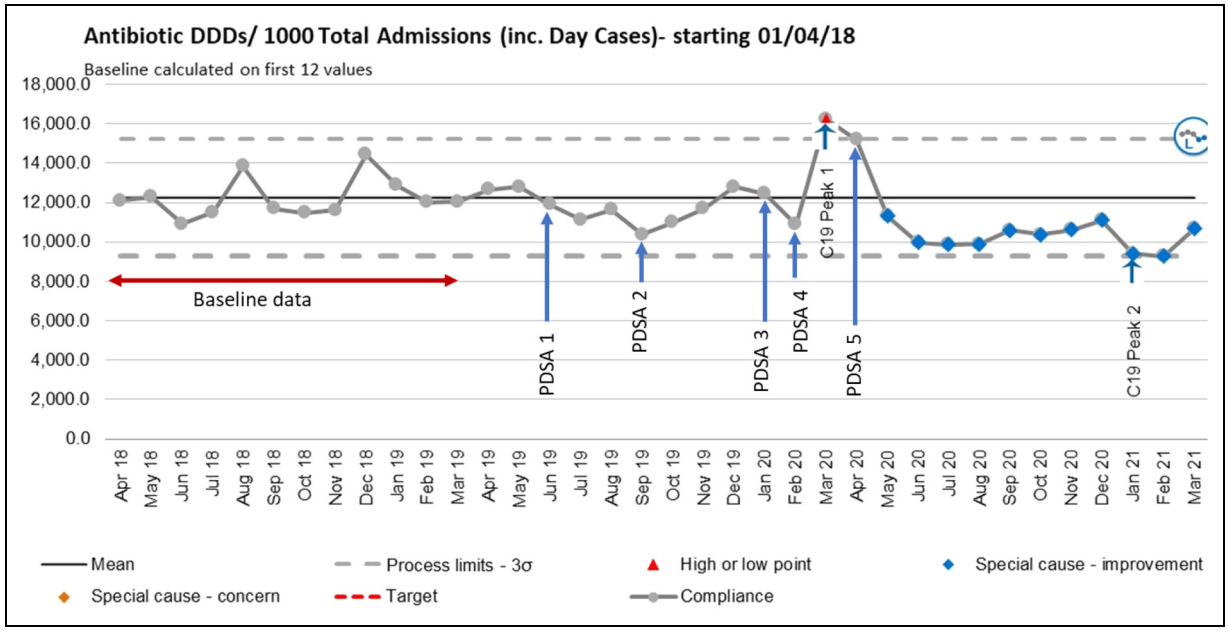

Figure 1. Antibiotic use (DDD per 1000 total admissions (inc. Day Cases)) in a cancer centre from April 2018 to March 2021 plotted on a statistical process control chart.

3. To gather data on antibiotic use (DDD per 1000 total admissions (inc. Day Cases)) in 2018 in a cancer centre to establish a baseline.

Method: Retrospective antibiotic use data from April 2018 to March 2019 was collected from DEFINE RX Info and plotted on a statistical process control (SPC) chart to establish a baseline. Interventions to reduce antibiotic use were identified by the project stakeholders and implemented through six plan, do, study and act (PDSA) cycles. Antibiotic use data was collected from DEFINE RX Info monthly from April 2019 to March 2021 and plotted on an SPC chart to establish the impact of interventions.

Discussion: Figure 1 shows antibiotic use decreased by 1% in 2019/20 and by 12% in 2020/21. Overall antibiotic consumption decreased by 13% from the 2018/19 baseline. The SPC chart shows a special cause improvement demonstrating a statistically significant reduction in antibiotic prescribing.

The frequency of auditing adherence to the Start Smart – then Focus principles was increased from 6 monthly to once monthly during PDSA 1 and from once monthly to twice weekly during PDSA 4. These interventions enabled the poor prescribing practice to be promptly identified and education and training were provided to prescribers in real time to improve antibiotic stewardship.

Ciprofloxacin neutropenic sepsis prophylaxis was removed from solid tumour anti-cancer therapy proformas in response to the MHRA Fluoroquinolone Drug Safety Alert in PDSA 2. Ciprofloxacin consumption decreased by 35% between 2018/19 and 2020/21 and unintentional negative patient impact has not been observed.

The Antimicrobial Guidelines were moved from a large PDF document to a digital mobile application in PDSA 3. This enables quick and easy access to antibiotic guidance and course length to improve antibiotic stewardship.

Twice weekly face-to-face antimicrobial stewardship ward rounds moved to video call in PDSA 5. This enabled ward rounds to continue throughout the Covid-19 pandemic. An additional benefit was it was easier to access patients' electronic healthcare records over a video call, which was previously challenging due to limited computers.

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Abstract 79
Type: Poster
Category: Service Development/Improvement

SACT delivery in the home – The Christie at home service

Joseph Williams, Loretta Watt, Natasha Scarry, Rachel James, Ashley Winstanley, Rebekah Pettinger, Kayley Smalley and Stephanie Hechter

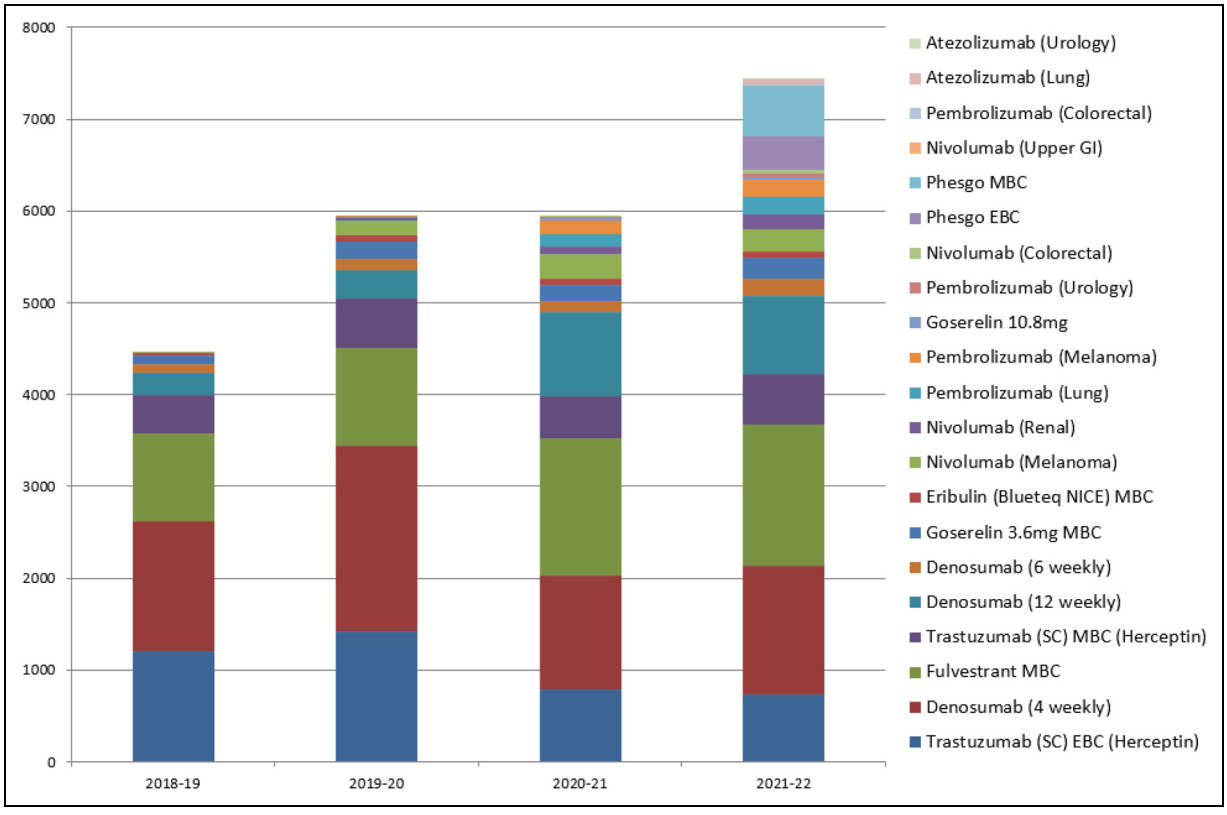
Background: The coronavirus disease 2019 (COVID-19) pandemic has required hospitals and national health systems globally to urgently adopt contemporaneous changes to the delivery of healthcare to cope with the increasing pressure on services [1]. For pharmacy, this has meant an increase in interest from clinical teams in the Christie at Home (C@H) service over the past few years. C@H was launched in 2015 and is a nursing and Pharmacy led initiative that provides injectable and intravenous Systemic Anti-Cancer Therapy (SACT) at home to patients across Greater Manchester and Cheshire. Homecare is predicted to have wide-ranging benefits, including – reduced pressure on hospitals and improved adherence to therapies, quality of life, and patient engagement with treatment.[2] Homecare services are traditionally provided by external homecare companies however providing this service internally with Christie branded care is important to our patients and allows autonomy over our service.

Objective/purpose

1. To examine the changes between C@H and general trust-wide SACT activity between 2018/19 and 2021/22
2. Analyse new immunotherapy C@H activity in 2021/22 to see how we can optimise and plan for capacity moving forward

Understanding a potential shift in C@H activity would allow us to add more resources including staff and digital improvement to the current service.

Study design/methods: A data collection tool was developed between digital services and the C@H team. This tool allows activity documented as 'Administrated' on our electronic prescribing



Graph 1. C@H activity (number of SACT administered to patients) from 2018/19 to 2021/22.
*Predicted activity for 2022/23 – 9936.

system to be automatically sent to a C@H activity spreadsheet on a digital network. Electronic records therefore of all C@H patients who had received SACT from 2018/19 to 2021/22 were retrospectively collected and broken down into individual drugs and disease groups. We used 'SACT cycles administered' to show C@H activity difference over a 4-year period across eight cancer disease groups and we used percentages (%) to show a change in activity between C@H activity and overall trust activity over the same 4-year period. This data was analysed in Microsoft Excel and plotted into an appropriate graph.

Results/key findings: During the pandemic (i.e. 2019/20–2020/21) overall activity dropped at The Christie by 7% (73,125 to 68,107 patients). From 2020/21 to 2021/22 overall trust activity increased by 12% (68,107–77,333 patients). C@H activity however stayed the same between 2019/20 and 2020/21 and increased by 20% from 2020/21 to 2021/22. In 2021/22, an extra 996 administrations were documented for new SACT indications – this included Trastuzumab/Pertuzumab (Phesgo) (915), Nivolumab (6), Pembrolizumab (13) and Atezolizumab (62).

Conclusion/recommendations: This data demonstrates that C@H has a wide-ranging list of benefits, including reduced pressure on hospital treatment chairs (7444 fewer chairs required on site in 2021/22) and improved adherence to therapies, especially during the COVID-19 pandemic. More studies will be carried out to see whether C@H offers benefits to patients' quality of life and patient engagement in their treatment. Digital solutions (including ePROMS) will also be part of further studies. To also free up capacity self-administration of Trastuzumab will be implemented in 2022 as a quality improvement saving and to also optimise capacity due to the introduction of Phesgo in 2021/22 and the expected increased activity in 2022/23.

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Abstract 80

Type: Poster

Category: Service Development/Improvement

Outpatient service impact from adjuvant Abemaciclib and Olaparib for early breast cancer

Cheuk-kie Jackie Cheung

Objective: Abemaciclib and Olaparib are two new adjuvant treatments for early breast cancer that have recently been implemented at the Nottingham University Hospitals NHS Trust. Early breast cancer is one of the most common cancer diagnoses and the introduction of new medications can lead to significant challenges with service delivery due to the large patient numbers. To estimate the additional impact on outpatient service, we retrospectively review all new patients discussed at the breast multidisciplinary team (MDT) meeting to identify the recommended treatment based on post-operative histopathology and receptor status.

In our practice, adjuvant Abemaciclib is offered to patients with oestrogen receptor (ER) positive and HER2 negative disease, with at least four positive axillary lymph nodes, or one to three positive axillary lymph nodes with either grade 3 or T3 (> 5 cm) disease. This is in line with the monarch study[1] and NICE approval.[2] Patients will be reviewed in the clinic monthly for 6 months, followed by 3 monthly reviews until the completion of 2 years of treatment.

Olaparib was offered to all HER2-negative early breast cancer with pathogenic germline BRCA1 or BRCA2 variants in the OlympiA[3] but we have restricted it to triple-negative breast cancer locally. The total treatment duration is one year with the monthly review. Olaparib is not currently licensed in the UK for this indication.

Method: All new patients discussed at the early breast MDT between July 2021 and June 2022 were identified from InfoFlex software by the hospital IT report team, along with MDT outcome, histopathology and receptor results. Patients with ductal or lobular carcinoma in situ were excluded. Eligibility for Abemaciclib and Olaparib was estimated based on the criteria described above.

Results: 678 patients were identified through the MDT record. 87 patients (12.8%) had HER2-positive disease. Of the 484 patients with ER positive and HER2 negative disease, 66 patients were eligible for adjuvant Abemaciclib, contributing to 594 outpatient appointments in the first year and 858 from the second year onwards. In the triple-negative cohort (107 patients), six patients carried pathogenic germline BRCA variants and were eligible for an adjuvant Olarparib study. Adjuvant Olaparib will contribute to 78 additional appointments per year.

Discussion and conclusion: The introduction of these two adjuvant treatments for early breast cancer put a significant strain on the existing outpatient service with an average of 18 additional appointments required per week. With adjuvant Abemaciclib approved by NICE in July 2022, all NHS trusts will need to acknowledge and plan for this service delivery. We plan to utilise a combination of pharmacist-prescribing clinics and digital review clinics to help our patients through their cancer journey. The local BRCA positive rate (6/107) is significantly lower than the 10%–20% reported in other literature[4] and might represent under-testing and underestimation of potential patient numbers.

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