Awards and Poster Presentations

UKCPA Awards (Poster) Section
The following paper won an award during 2016

UKCPA Patient Safety Award 2016, supported by Pfizer
Improving the pharmaceutical care of patients on psychotropic medication admitted to an acute hospital – the impact of a proactive ‘inreach’ specialist psychiatric pharmacist service
Raliat Onatade, King’s College Hospital NHS Foundation Trust, Oluwakemi Oduniyi, South London and the Maudsley NHS Foundation Trust

UKCPA/PRUK Clinical Research Grant (Poster) Section
The following papers successfully secured UKCPA/PRUK research funding

2014
Use of unlicensed medicines within primary and secondary care settings: A qualitative study
Gemma Donovan¹, Lindsay Parkin¹, Lyn Brierley-Jones², Scott Wilkes².  
1. University of Sunderland, 2. Teesside University, Middlesbrough

2015
Pharmacy TECHnician supported MEDicines administration (TECHMED) in hospitals: understanding implementation and delivery
*Manchester Pharmacy School, University of Manchester, †Salford Royal Hospital NHS Foundation Trust

Poster Presentations

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<td>Sarah Morris and Alan Field, †Salford Royal NHS Foundation Trust</td>
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| 55            | An audit of apixaban prescribing for atrial fibrillation in a hospital setting  
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| 68            | Is there a role for veterinary pharmacy in the management of dairy mastitis?  
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| B                 | Prevalence and awareness of the Insulin Passport at Royal Stoke University Hospital  
Brockley, D. and Sleigh, J., University Hospitals of North Midlands NHS Trust, Stoke-on-Trent |
| C                 | Antibiotic prophylaxis in cardiothoracic surgery  
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| D                 | Prescribing of ivacaftor for cystic fibrosis in accordance with the clinical commissioning policy  
Sian Farrell, University Hospitals Bristol |
| E                 | Denosumab for fracture prevention: a snapshot of compliance with Buckinghamshire Treatment Guidelines  
Sabiehah, Latif, Buckinghamshire Healthcare Trust |
| F                 | Drug-drug interaction review in patients started on oral hepatitis C therapy  
P. Trembling, W. Rosenberg, D. Macdonald, Royal Free Hospital, NHS Foundation Trust, London |
| G                 | Evaluating Pharmacist Interventions in Community-Acquired Acute Kidney Injury Emergency Admissions to Salford Royal Foundation Trust  
Amelia Reed, Elizabeth Lamerton, Salford Royal NHS Foundation Trust |
| H                 | An audit of pharmacist's documentation of administration instructions of medicines via enteral feeding tubes  
Clara Silcock, Sarah Zeraschi, Leeds Teaching Hospitals Trust |

### Disclaimer

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UKCPA Patient Safety Award 2016, supported by Pfizer
Improving the pharmaceutical care of patients on psychotropic medication admitted to an acute hospital – the impact of a proactive ‘inreach’ specialist psychiatric pharmacist service
Raliat Onatade, Pharmacy Department, King’s College Hospital NHS Foundation Trust
Oluwakemi Odunyvi, Pharmacy Department, South London and the Maudsley NHS Foundation Trust

Background
King’s College Hospital (KCH) is a 1000-bedded acute hospital in South London. All wards receive a comprehensive clinical pharmacy service, with pharmacists available to wards all day. Patients with severe mental illness (SMI) admitted to the hospital may be referred to the Psychiatric Liaison Team (PLT) for advice on management of mental health problems and medication. It was believed that despite the availability of the PLT, patients on psychotropic medications still had unmet pharmaceutical needs. Patients with SMI and disabilities have a higher risk of poor physical health and premature mortality than the general population but also often do not engage well with primary care services. Therefore ensuring adequate physical health monitoring can be challenging. In 2015, the pharmacy department agreed to lead on a Local Incentive Scheme (LIS) to improve the pharmaceutical care and physical health monitoring of patients who were not seen by the PLT. A collaboration was agreed between KCH and South London and the Maudsley Mental Health Trust (SLAM) for a specialist psychiatric pharmacist (PP), employed by SLAM, to provide an inreach proactive consultation service to KCH. This report describes the safety impact of the first five months of this service.

Objectives
The main objectives of the specialist pharmacist are to:
- Work closely with clinical pharmacists to carry out medication reviews
- Improve the uptake of physical health monitoring of patients
- Improve communication of medication review outcomes to GPs on discharge
- To share and sustain learning with the pharmacists and doctors

Method
Inclusion criteria for eligible patients were agreed. A daily electronic report of patients who met the criteria was developed. The PP downloads the patient list daily, and uses the electronic patient record and drug chart to identify patients to review. Other pharmacists also contact the PP about patients for whom they have queries. The PP then goes to the wards to see the patients and discuss any required actions with pharmacists, doctors and nurses. Details of clinical contributions are recorded. The PP works 1 day at work back at base to maintain her specialist knowledge. Two senior experienced psychiatric pharmacists (not involved in the service) used an adaptation of the National Patient Safety Agency risk matrix to assess the clinical significance of the PP’s input to each patient. Ethics approval was not required.

Results
Between December 2015 and April 2016, 200 patients were reviewed (205 patient encounters as 2 patients were reviewed more than once). 124/200 (62%) required input from the specialist pharmacist. 50/124 (40.3%) patients had recommendations made to their GP. 313 clinical contributions were made (2.5 per patient).

48% (151/313) related to physical health monitoring, 44% of which (66/151) were implemented during the patient’s stay. 32% (99/313) were drug related problems (DRPs), 31% of which (31/99) led to a change in therapy. 20% (63/313) involved providing education or information.

Table 1. Drug-related problems and risk ratings

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<th>Drug-related problems (n = 99)</th>
<th>Clinical risk rating per patient (n = 124)</th>
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<tr>
<td>Drug interaction</td>
<td>18 (18%)</td>
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<td>Therapeutic drug monitoring</td>
<td>14 (14%)</td>
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<tr>
<td>Prescribed dose too high</td>
<td>13 (13%)</td>
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<tr>
<td>Preventative therapy</td>
<td>11 (11%)</td>
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<tr>
<td>Drug selection problem</td>
<td>8 (8%)</td>
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<td>Drug supply</td>
<td>7 (7%)</td>
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<tr>
<td>Adverse event</td>
<td>4 (4%)</td>
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<tr>
<td>Contraindication</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Other</td>
<td>20 (20%)</td>
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9.5% (19/200) patients were on clozapine, 14/19 (74%) of whom required input. 12% (39/313) of all contributions involved clozapine (2.8 contributions per patient). 53.5% (107/200) patients were on selective serotonin reuptake inhibitors (SSRIs), 31/107 (29%) of whom required input. 19% (60/313) of all contributions involved SSRIs (1.8 per patient). Chart 2 shows the risk ratings allocated to the clinical contributions. Considering the whole population of 200 patients, the relative risk of a patient on clozapine being at high or extreme risk without input was 2.46 (95% CI 1.33 to 4.56, p = 0.02). Of the patients on SSRIs who required input, 71% (22/31) were also at high or extreme risk, compared to 18% of patients on non-SSRIs (Chi-square = 41.4, p < 0.0001).

The PP has also delivered teaching sessions for pharmacists and junior doctors, developed a psychotropic medication review checklist for pharmacists, guidance on psychotropic drugs for new doctors and an aide-memoir for doctors and pharmacists on how to appropriately communicate psychotropic medication changes to GPs.

Discussion
A proactive, specialist pharmacist inreach consultation service has significantly improved the care of patients taking psychotropic medicines in an acute hospital. The use of technology enabled effective identification of patients. Nearly one-third of this vulnerable group of patients seen were at high or extreme risk without the specialist pharmacist’s input. Due to a lack of specialist knowledge regarding psychotropic drugs, and the PLT’s referral model, some DRPs were not being detected. Patients taking clozapine in particular are at high risk from DRPs. Additionally, a large proportion of patients on SSRIs who required input were at high or extreme risk. The proactive nature of the service has also ensured that many patients received their essential physical health monitoring. This care model demonstrates that where expert clinical knowledge is lacking, proactive review by a specialist is essential to ensure appropriate care. This also enables continuous upskilling of staff. Due to its success, funding for the service has been continued. This model is appropriate for other specialties, and we will be implementing a reciprocal service to the mental health trust for patients requiring review of their physical health medications.

References:
Background
An unlicensed medicine (ULM) is a product which does not have a marketing authorisation from the MHRA. Previously unexplored areas include; how and why prescribers choose to initiate them, how and where pharmacists source them, patient use and awareness of ULMs.

Objectives
This research study aimed to explore perceptions of healthcare professionals and patients regarding the use of ULMs.

Method
Semi-structured face-to-face interviews were conducted with prescribers (n=11), pharmacists (n=10) and patients (n=7) from primary and secondary care. Grounded theory analysis led to the development of emerging themes informing participant selection. Interviews were audio recorded and transcribed verbatim. Themes were fed back to participants (n=8) via two focus groups. This study required and received ethics approval.

Results
Several themes were identified across the data, by healthcare professionals and patients in primary and secondary care, including:

- Healthcare professionals’ definition and their awareness of when they were using an ULM
- Perceptions of ULM safety, including a lack of available safety and efficacy data and perceived under-reporting of adverse effects
- Provision of information; are patients likely to be informed about the unlicensed status of their medicines? Who should inform them of this? What information should be provided?
- The place of ULM use in the clinical management of a patient, including whether licensed alternatives were tried first
- Trust was an important aspect across ULM between professionals, patients and those who procure and supply ULMs

Lack of education and training for healthcare professionals on defining what an ULM is, the associated implications of their use, coupled with a lack of information appears to perpetuate problems identified in the use of ULMs. Particular consideration should be given to non-medical prescribers who may not have initially been able to prescribe ULMs and therefore received no training in this area. Within primary care, cost was an important consideration however many secondary care participants lacked an awareness of the associated costs. More of an emphasis was placed on providing a viable and timely treatment option. Costly and burdensome regulatory processes for medicines licensing were often cited throughout for the use of ULMs and seemed to legitimise their routine use in practice.

Conclusion
The absence of a marketing authorisation is associated with multiple issues relating to ULM use, including restricted access to information and reduced intelligence around their safety and efficacy. Despite this they are generally perceived as safe. Regulatory implications of using ULMs and the potential variability between products, does not seem to be well understood. Consideration of how the patient will use the medication and the provision of suitable written information seems to be variable. There is a need for training and the development of mutually agreed standards on the use of ULMs to inform a more consistent approach to their use by both healthcare professionals and patients. Although theoretical data saturation was reached, these themes would benefit from being tested using a quantitative approach.

References
Background
Medication given at the wrong time and dose omissions are consistently reported as the most common types of medication administration errors in hospitals, posing a significant patient safety risk. In the UK, there is growing interest in pharmacy staff support during medicines administration rounds given how frequently ‘preventable’ omissions such as unavailable medicines cause omitted doses. This is in part because an important role for many pharmacy staff is ensuring wards have regular medication supplies. An NHS hospital in North West England piloted pharmacy TECHnician supported MEDicines administration (TECHMED) service on inpatient wards with the aim of reducing omitted doses.

Objectives
The overall aim was to evaluate the implementation and delivery of the pilot TECHMED service. Objectives were to:
- gather stakeholders’ perception and experiences of TECHMED,
- determine the qualitative impact of TECHMED on stakeholder workload, and
- develop recommendations for future roll-out of this service.

Method
TECHMED operated as a randomised trial design over a four-week period in March/April 2016. Trained pharmacy technicians accompanied nurses on three of four weekday medication administration rounds on three wards. Technicians assisted nurses in locating medication to prevent missed doses. Qualitative techniques were used to assess how the intervention was implemented and delivered, and the impact on workload. Interviews were analysed using Weiss’s logic of analysis in evaluation. The study received university ethical approval (UREC2:15501).

Results
Twenty-two interviews were conducted (10 technicians, 9 nurses, 3 senior managers). Participants understood the purpose of TECHMED and felt prepared to provide the service. There was some deviation in service delivery; technicians were asked to follow the nurse round so that they were available to check for missed doses, this did not always happen, for reasons relating to local circumstances and the number of scheduled doses due on certain medication rounds. Many interviewees recalled occasions where they had prevented patients missing their medication. Technicians worked overtime to provide morning and evening rounds, but found that participating in the lunchtime round could negatively impact on workload. Participants reported enhanced working relationships. Whilst interviewees were broadly supportive of extending TECHMED, some suggested targeting high-activity medication rounds/wards; a view supported by senior management.

Conclusions
The TECHMED service was well-received by those providing it. The fidelity of the service was not complete and this is something that future studies must address in order to maximise sustainability. Ongoing research will measure the quantitative impact of TECHMED on omitted doses and future efforts should consider evaluating this service in different health care settings.

References
1. The level of compliance with medication reconciliation on discharge for paediatric patients at Chelsea and Westminster Hospital
Hani Addada & Maria Moss, Chelsea and Westminster Hospital, London

Background
Medicines reconciliation (MR) is the process of creating the most accurate list possible of all medications a patient is taking. The National Institute of Excellence (NICE) published guidance in 2015 on MR for all care settings which advise health and social care practitioners to proactively share and complete accurate information about medication, ideally within 24 hours of the patient being transferred.

Objective
To determine if NICE guidance for MR and communication on discharge is being followed on the paediatric inpatient wards at Chelsea and Westminster Hospital (CWH).

Standards
1. 100% of discharge summaries (DSUMs) include any known drug allergy status
2. 100% of patients have their medicines accurately reconciled by a pharmacist and/or doctor at discharge within 24 hours
3. 100% of relevant DSUMs include the reason for the stop, start or change to medication
4. 100% of patients have their DSUM sent to the GP within 24 hours of discharge
5. 100% of relevant DSUMs include the appropriate supply information for special/unlicensed medications

Methodology
Data was collected retrospectively for 2 weeks on the paediatric wards. Each patient discharged was assessed for eligibility for the audit. The inclusion criteria were: Any patient admitted for ≥24 hour stay in hospital with ≥1 regular medication from the drug history. DSUMs were printed for each patient and a data collection form completed to assess compliance with audit standards using the electronic prescribing system. The data collection form was piloted and amended as appropriate. Ethics approval was not required. Trust approval was obtained. The sample size was 30 DSUMs.

Results
Standard 1 was met. All other standards were not met. For standard 2, 63% DSUMs did have regular medication reconciled at discharge. Not having this record will cause errors especially for patients receiving care from different specialist centres. For standard 3, 71% of DSUMs had documented change & standard 4, 83% DSUMs where sent in time. In order for healthcare professionals in primary care to continue medications correctly they need to be fully informed with respect to ongoing treatment in a timely manner; including medication that have been stopped, started or changed and the reason for this. Communication is essential to improve adherence to treatment plans and reduce the likelihood of adverse events caused by failure to prescribe and monitor. For standard 5, 40% included supply information. Seamless care letters are available for special/unlicensed products that can be easily attached to the DSUM and send to the GP and community pharmacy to aid with further supply.

Conclusion
This audit has emphasised that MR should take place for every patient on discharge as it is a vital part of communication for all transfer settings. Unintended changes to medication regimens can jeopardise treatment, and increase the risk of re-admission to hospital.

References

2. Audit of the management of delirium in three adult intensive care units (ICUs)
Fozia Ahmad & Reena Mehta, King’s College Hospital NHS Foundation Trust, London

Background
ICU delirium is an acute organ dysfunction which occurs due to a complex interplay of numerous predisposing and precipitating factors. It has an estimated incidence of 2-80%[1] and can have detrimental short-term and long-term impact on patients, including an increase in mortality [2]. The Delirium Working Group (DWG) at King’s College Hospital was set up to promote awareness, produce guidance and improve the management of delirium. This was a pharmacy led initiative as no recommendations existed previously. This audit was conducted to evaluate adherence to the guidelines.

Objectives
To audit current practice against guidelines – the audit standards were that 100% of patients started on pharmacological therapy would:
- Have a positive delirium assessment using the ‘Confusion Assessment Method for the ICU‘ (CAM-ICU) tool documented on day one of therapy
- Be prescribed drugs and doses recommended within the guidelines
- Have daily electrocardiograms (ECGs) conducted if they were on quetiapine or haloperidol
- Have a referral to the Dementia and Delirium (DAD) team if they were discharged from ICU and still required pharmacological therapy
- Have electrocardiograms conducted if they were on quetiapine or haloperidol

The audit also identified whether treatable exacerbating factors were present in these patients. These included: history of drug and/or alcohol withdrawal, hypoxia, pain, constipation, hypo/hypernatraemia and use of deliriogenic drugs.

Method
All patients, over 18 years old admitted to ICU and started on pharmacological therapy for delirium between November and December 2015 were included in the audit. Data was collected in real time and patients were followed up until cessation of therapy or discharge from ICU. This study did not require ethics approval.

Results
45 patients were followed up in this audit. On average, pharmacological therapy was started on day 7.5 of ICU stay. 26/45 patients (58%) had a CAM-ICU documented on day 1 of therapy. All patients had drug choices and doses prescribed as per guideline recommendations. 34 patients required a
daily ECG, 4/34 patients (12%) had this done daily. 27 patients were discharged from ICU on pharmacological therapy, and 5/27 patients (19%) were referred to the DAD team. The most common exacerbating factors were hypo/hypertensionaemia in 17/45 patients (38%) and constipation in 11/45 patients (24%). 36/45 patients (80%) were on deliriogenic drugs which can contribute to delirium. Most common were opioids for pain relief and anticholinergic agents – which could not be discontinued or replaced with alternatives.

Conclusions
Documentation of CAM-ICU assessments by nursing staff and handover to the DAD team on discharge needs improvement. Performing daily ECGs when patients are on quetiapine or haloperidol are essential in the critical care setting as patients may have other risk factors predisposing them to a prolonged QTc. This is an area which also needs improvement.

The delirium guideline was successful in formalising the management of delirium, however, this needs to be woven into practice to ensure a multi-disciplinary approach to optimising delirium management.

References

| 3. Improved patient outcomes with dedicated ‘Enhanced Recovery’ Pharmacist review of surgical patients |
| Neetu Bansal, Central Manchester University Hospitals NHS Trust |

Context
This study was undertaken at the Central Manchester University Hospitals NHS Trust (CMFT) as part of a NICE scholarship project. The aim was to look at the impact pharmacist involvement has on enhanced recovery (ER) programmes specifically within colorectal patients.

Problem
Enhanced recovery (ER) protocols were introduced within CMFT in 2010 with no dedicated pharmacist involvement, although a lot of the interventions proposed were medication related. This is a national problem and I was keen to demonstrate how pharmacists can add to these pathways to further improve patient outcomes. This study did not require ethical approval.

Assessment of problem
Firstly, baseline data was collected on the current service with patients seen in a nurse led clinic prior to surgery. These results were presented to the key stakeholders which demonstrated that the trust was non compliant with the current target for the estimated length of stay and details of the post-operative complications that could have potentially been avoided.

Intervention
To see an improvement, patients should be optimised both prior to surgery and have better management of any post-operative surgical related complications. In the pre-operative phase, patients whom were listed for surgery were screened by a pharmacist who ascertained based on the patient’s American Society of Anesthesiologists grade (ASA grade) and drug history whether the patient needs to be contacted pre-operatively. Interventions at this stage would include the pharmacist providing appropriate peri-operative advice to the patient over the phone and identifying opportunities for medicines optimisation. Two weeks before surgery, the patients were sent a ‘reminder’ via text message to ensure they stop their medication as intended. Post-operatively, patients were followed up closely with the focus on minimising any complications.

Strategy for change
As part of the implementation process, which took about three months, the pharmacist informed all stakeholders by both email and face-to-face discussions of the change. Opportunities for feedback included ER meetings with key stakeholders.

Measurement of improvement
This change led to an overall reduction in the median length of stay (Baseline group - 10.5 days; Intervention group - 7.5 days, p < 0.001, Wilcoxon signed rank test) and post-operative complications (Baseline group – 136; Intervention group – 75, p > 0.05, chi-squared test).

Effects of changes
This project has raised awareness within the trust of the value pharmacists can add to ER pathways. Benefits to patients are clearly transparent with improved patient experience and less risk of hospital acquired infections due to reduced inpatient stay.

Conclusion
Setting up a new service in a workplace is challenging. The main message to others is to engage with key stakeholders sooner rather than later to implement changes that lead to service improvement. These results can be replicated across all trusts nationally with huge cost savings to the NHS.

References

| 4. Analysis of the medicines most frequently involved in pharmacist interventions |
| Basi T, Miller G, Lewisham and Greenwich NHS Trust |

Background
Ward pharmacy plays an essential role in optimising patient care and ensuring the safe use of medicines within hospitals. Pharmacists at Lewisham and Greenwich NHS Trust (LGT) collected pharmacy intervention data with the overall aim of informing service improvement.

Objectives
- Identify the medicines most commonly involved in pharmacist interventions
- Analyse pharmacist interventions for commonalities and make recommendations to reduce prescribing errors.

Method
Pharmacists collected data on the interventions they made over a two day period in December 2015. An intervention was defined as “an action which will, or is intended to, result in a change in an individual patient’s care”. All interventions were recorded in Excel and the data were analysed by a
pre-registration pharmacist to identify the medicines most frequently involved. Interventions relating to these medicines were further analysed to identify the types of interventions required and the reason for intervention. Recommendations were then made to prevent future prescribing errors. Ethics approval was not required.

Results
In total 662 interventions were made involving 195 medicines. The fifteen most common drugs accounted for 248 interventions (37%); nine of these belonged to classes flagged up in the review of medication incidents reported to the National Reporting and Learning System.

The top five medicines involved were:
1. Gentamicin (n=43): Drug serum levels were commonly required. Levels may not have been taken due to layout changes on the new LGT drug charts, which were introduced less than a month prior to data collection. Weight and, where appropriate, adjusted body weight, as well as renal function required better consideration by prescribers when calculating doses.
2. Enoxaparin (n=41): Requirements of weight, renal function and platelet levels accounted for almost half (48%) of the enoxaparin interventions.
3. Paracetamol containing products (n=18): Dosing based on patient weight was implicated in 50% of the paracetamol interventions.
4. Teicoplanin (n=16): Non-adherence to antibiotic guidelines accounted for nine interventions. As with gentamicin, serum levels were also frequently needed.
5. Thiamine (n=16): Prescribers requested treatment cessation in medical notes without making changes to the prescribed medication on the drug chart.

Additionally, the need for a prescriber signature and other legal issues, particularly regarding controlled drugs, accounted for 7% of interventions. Limitations include potential seasonal influences due to the time of data collection. Also, time constraints meant that not all pharmacists provided data on their interventions and some interventions only had brief details recorded.

Conclusions
The medicines most frequently involved in pharmacist intervention were either high risk medicines or those commonly prescribed. The types of interventions were identified and key trends have been included in educational sessions for doctors and pharmacists with particular emphasis on antibiotic prescribing and therapeutic drug monitoring. Ensuring patients are weighed upon admission is being raised through various nursing forums.

References

### 5. Improving the quality of prescribing and administration records of oxygen

**Toby Capstick, Leeds Teaching Hospitals NHS Trust**

**Background**
Oxygen is a lifesaving medicine for patients with hypoxaemia, and must be prescribed when used. The 2015 national oxygen audit highlighted variability in performance at our Trust; a higher percentage of patients had an oxygen prescription compared to the national average at one hospital site (91.9% vs. 42.5%), but was lower at another (22.2%). A subsequent audit highlighted prescribing rates in some specialties of only 10%, and a record of administration completed on only 10-50% of drug rounds.

A new approach was adopted to improve practice and reduce variation in practice.

**Objectives**
To determine whether oxygen prescribing and record keeping met the audit standard, requiring 90% of in-patients to have:
- Oxygen prescribed correctly with target oxygen saturation (SpO2) specified
- A record of administration completed on every drug round

Similarly to the national oxygen audit, it was not practical to audit whether an appropriate SpO2 was prescribed.

**Method**
Strategies employed to improve practice included:
- A joint letter to all staff from the Chief Medical Officer, Chief Nurse and Clinical Director for Medicines Management and Pharmacy Services highlighting professional responsibilities when using oxygen.
- A Quality and Safety bulletin and computer screensaver on ‘Safe Prescribing and Administration of Oxygen’.
- Physiotherapy and pharmacy teams championing the safe use of oxygen.

An audit of oxygen prescribing and administration records for every in-patient was performed by pharmacy staff during one week in April 2016. This study did not require ethics approval.

**Results**
A total of 1,474 patients on 93 wards were audited. Of the 294 (19.9%) patients receiving oxygen, 255 (86.7%) had oxygen correctly prescribed, and compliance across different specialties ranged from 57.1% to 100%.

In the preceding 24 hours; 154 (52.4%) patients had a record of administration of oxygen on at least one drug round, whilst 99 (37.8%) adult patients had oxygen administration recorded on all four drug rounds and 21 (65.6%) paediatric patients had oxygen administration recorded on two drug rounds. Compliance across different specialities ranged from 7.3% to 96.4%.

**Conclusion**
Following intensive publicity, prescribing practice improved significantly, but was poorer in areas where oxygen isn’t routinely used compared to respiratory and critical care wards; due to lack of understanding that oxygen is a medicine that must be prescribed. Compared to the national audit, completion of an oxygen prescription at one hospital site improved from 22% to 85%; but was comparable at the other site (92% vs. 87%).

Just over half of the patients had a record administration of oxygen on at least one drug round in the past 24 hours, but only one third of adults had a record on each drug round.

Further work is ongoing to raise awareness and education for staff, as well as designing an improved oxygen prescription chart, which guides staff more clearly on the use of oxygen.

**References:**
6. Using electronic prescribing and administration to reduce the risks with intravenous magnesium sulphate
Gillian Cavell, Caroline Anderson, Pharmacy Department, King's College Hospital NHS Foundation Trust. London

Background
Intravenous (IV) magnesium sulphate is a high risk injectable medicine. It is prescribed in acute care settings to correct electrolyte abnormalities and manage obstetric emergencies. Although guidelines are available for some indications the doses of magnesium prescribed may vary between prescribers. In clinical areas concentrated solutions are diluted following complex dose-volume calculations. Multiple concentrations may be available with potential for mis-selection errors.

An untoward incident involving a significant overdose of magnesium1 prompted us to standardize the prescribing and administration of IV magnesium within our organization.

Objectives
To identify magnesium protocols in use across the trust
To direct practitioners to the lowest risk injectable magnesium product for the indication
To monitor the impact of changes on the use of injectable magnesium

Method
Guidelines referring to IV magnesium sulphate were identified. These included hypomagnesaemia, obstetric emergencies and treatment of asthma and cardiac arrhythmias. Methods of preparation and administration of recommended doses using concentrated solutions were risk assessed according to the NPSA Injectable risk assessment tool.2

Alternative products and methods of preparation which reduced the risk score were identified. Guidelines were reviewed to recommend the use of products with lower risk scores. Ward stock lists were updated to eliminate storage of multiple concentrations of magnesium sulphate injections.

Orders for magnesium sulphate infusions within our electronic prescribing system (EPMA) were reviewed. A series of indication-specific order sets were developed for hypomagnesaemia, asthma and arrhythmias and obstetric indications to utilise available concentrations of magnesium sulphate solutions and minimise the need for complex calculations and dilutions.

Ethics approval was not required for this service evaluation.

Results
Risk scores for the preparation of doses of IV magnesium sulphate for all indications were reduced from amber (risk score 3-5) to green (risk score 1-2).

Changes in usage data for magnesium products trustswide illustrate an increase in the use of safer products where these are available. These included an increase in the numbers of ampoules of magnesium 10% recommended for 8mmol doses for asthma and arrhythmias from an average of 253/month between July-December 2013 to 552/month between July and December 2014, suggesting that doses had previously been prepared using 50% ampoules.

The use of magnesium sulphate 50% ampoules for hypomagnesaemia was reduced with the temporary introduction of 20mmol/100ml ready to administer infusions. Interruptions to supply forced us to continue with the use of higher risk ampoules albeit with more guidance for clinical staff at the point of use.

Conclusion
EPMA has been successfully used to standardize the prescribing and administration of IV magnesium to optimise its use and reduce the risk of patient harm.

Electronic orders for intravenous magnesium now include recommended doses of magnesium according to indication, advice on the product to be used to prepare the dose and the method of administration.

References

7. Reducing the risk of inpatient iatrogenic hypoglycaemia in hyperkalaemia treatment using e-prescribing and a multidisciplinary approach
Omar Mustafa1, Danielle Dixon2, Alison Cox3, Emma Goble4, Alice Burridge5, Ben Fidler5, Charlotte Bell4, Gillian Cavell4
Insulin Safety Group, King’s College Hospital NHS Foundation Trust, 1Consultant Physician, Diabetes and Endocrinology, 2Specialist Registrar, 3Clinical Nurse Specialist, 4Pharmacist, 5Clinical Systems Support

Background
Patients with hyperkalaemia are treated with intravenous infusions of glucose and insulin. Iatrogenic hypoglycaemia during hyperkalaemia treatment is known to occur locally, nationally and internationally and is a preventable patient safety incident.1,2 We identified hypoglycaemias post hyperkalaemia treatment locally despite the existence of a treatment order-set within our electronic prescribing system (EPMA). The order set had been designed to guide prescribers to prescribe IV insulin 10 units and IV glucose 20% to be administered at the same time, and recommended that capillary blood glucose (CBG) should be monitored ‘as required’. The order set was reviewed following a reported medication safety incident.

Objectives
To measure the incidence of hyperkalaemia treatment induced hypoglycaemia before and after implementation of the revised EPMA order-set

Method
Adult patients prescribed and administered IV Actrapid 10Units were identified from EPMA-generated reports. The electronic patient record (EPR) for each patient was reviewed. The number of times CBG was monitored after insulin administration and the lowest CBG were recorded for each patient. Hypoglycaemia was defined as a CBG below 3.5mmol/L.

Data were collected in March 2015 (pre-implementation) and May 2015 (post-implementation). Paediatric patients and patients with handwritten prescriptions were excluded.

Ethics approval was not required for the study.
Results
During March 2015, 57 patients were prescribed IV insulin for hyperkalaemia. 17 patients experienced hypoglycaemia (17/57, 30%) and blood glucose was monitored hourly for 18 patients (32%).
In May 2015 post-implementation of the revised hyperkalaemia order set 59 patients received IV Actrapid 10units, resulting in 7 hypoglycaemias (7/59, 7%). Hourly blood glucose monitoring for at least 4 hours was recorded for 54 patients (54/59, 90%). The incidence of hypoglycaemia significantly reduced following introduction of the order sets (chi² 5.6991, p<0.05). The number of patients whose blood glucose was regularly monitored also increased.

Discussion
Our intervention, designed in response to a reported adverse incident, to promote simultaneous insulin and glucose administration and schedule regular CBG monitoring post insulin administration was effective in reducing the incidence of hypoglycaemia. As well as reducing the incidence of a potentially harmful adverse drug event we have been able to demonstrate a direct patient benefit of an electronic prescribing system. The management of patients with hyperkalaemia relies on the application of clinical skills, knowledge and judgements of individual practitioners working amongst the numerous stressors and distractions in patient care settings. Our intervention was designed to address the human factors which may lead to hypoglycaemia by using reliable systems to support prescribers, schedule treatments correctly and then prompt the monitoring of those treatments to detect and manage problems promptly. This work adds evidence to the UK database of the patient safety benefits of electronic prescribing systems.

References

8. 24/7 Medication Collection, Zero Wait Time: NEW Prescription In Locker Box (PILBOX) Service
Vivian Chee, Christina Lim, Fei Ling Lo, Boon Kwang Goh, SingHealth Polyclinics (SHP)

Context
SingHealth Polyclinics (SHP), with 9 primary healthcare centres in Singapore, sees many stable chronic patients suitable for non-visit care opportunities like the self-collection of prescription refills and telecare services.

Problem
SHP’s pharmacies process over a million prescriptions a year, amounting to more than 5 million line items dispensed annually. This high patient load, coupled with finite resources frequently results in long waiting time and overcrowding at the pharmacies. This in turn can potentially discourage stable chronic patients from collecting their chronic medicines regularly, possibly leading to sub-optimal management of their chronic conditions.

Assessment of problem and analysis of causes
To better meet the growing needs and expectations of these stable chronic patients, a solution was needed to minimize the pharmacy waiting time for these patients and alleviate overcrowding at the pharmacy.

Intervention
The PILBOX service was conceptualized and developed with the use of innovative technology to function 24/7, allowing patients/caregivers to self-collect their refill medications from a locker system located at the polyclinic at their own convenience. After a one-time enrolment, patients/caregivers can schedule a medication collection date, with SMS reminders sent to them before the scheduled date.
On the collection day, the patient/caregiver will first make payment at a payment kiosk located next to the locker system or via an e-payment gateway. The PILBOX station will then verify the patient’s/caregiver’s identity before a designated locker opens up to allow access to his/her medications. A follow-up call will be made the following day to close the loop.

Strategy for change
The PILBOX service at Marine Parade Polyclinic (MPP) was launched on 22 Feb 2016, and is the first in Singapore. It will provide a good test-bed for further system and processes refinement, based on useful experiences and feedback gathered. There is intention to eventually propagate the PILBOX service to all SingHealth polyclinics.

Measurement for improvement
Since its launch, more than 80 patients from MPP had signed up for the service, of which 30 patients had already used and collected their chronic medication from the PILBOX lockers. Feedback from these patients has been positive, with 100% of them finding the service fast and easy to use. The impact (short and long-term) of the new PILBOX service, in terms of patient satisfaction, waiting time and congestion at the pharmacy, will continue to be monitored as enrolment numbers increase with active recruitment of chronic stable patients.

Effects of changes
None of the patients who used the PILBOX service had to wait/queue to pick up their chronic medications. This translated to 24.7 minutes of time savings per patient (based on 95th percentile patient wait time recorded at MPP), or a total time savings of 12.4 hours for the 30 patients who have used the service so far.

Conclusions
The PILBOX service provides an innovative, convenient and accessible mode of medication collection for patients. It helps to reduce overcrowding at the waiting area of the polyclinic pharmacy and enhances patient service quality.

Ethics Approval
Ethics Approval was not required.
Background

Hepatitis C (HCV) direct acting anti-viral agents (DAAs) represent a significant advance in treatment options for HCV infection. However, they are associated with a number of clinically important drug-drug interactions (DDIs). These DDIs require review and assessment prior to initiation of treatment to determine the potential impact on the patient. In tandem with medication reconciliation, DDI review is a key process completed as part of the Pre-Treatment Pharmacist Assessment (PTPA) to ensure optimum HCV treatment outcomes in our ambulatory care clinics. This pharmacist-led intervention employs a standardised DDI interaction reference list1 including the specialised University of Liverpool website2. No Irish studies published to date have examined the prevalence of potential DDIs identified through PTPA or the management strategies employed to prevent the potential negative impact of DDIs on treatment outcomes in our patient cohort.

Objective

To assess the prevalence and management of DDIs identified in patients undergoing PTPA with DAA-based HCV therapy in two ambulatory care settings in a large teaching hospital.

Method

All patients treated with all oral DAA based HCV regimens at St. James’s Hospital between December 2014 and November 2015 were included in the retrospective analysis of PTPA outcomes. Data was retrieved from pharmacy records and pharmacist PTPA worksheets and inputted into Microsoft Excel®. DDI outcome assessment was classified into three descriptive categories. Where a potential interaction was identified, a significance rating of ‘severe’ or ‘caution’ was applied. Six standard recommendations are incorporated into the PTPA:

- Stop interacting medication during HCV therapy
- Dose adjust interacting medication during HCV therapy
- Change interacting medication to an alternative
- Continue interacting medication and commence a monitoring plan
- Separate medication dosing times
- Consider alternative HCV treatment regimen

DDIs identified were discussed with the prescribing physician. Risk factors for potential DDIs were determined through univariate statistical analysis.

Results

A total of 142 patients were included in the PTPA review. Of these, 87% (125/142) were prescribed at least one medication at baseline. A total of 789 concomitant medicines were prescribed and required PTPA for screening for potential DDIs. Of these, 266 potential DDIs were identified. Over three-quarters (80%) of patients prescribed a concomitant medication (67% of the total study population) were subject to a potential DDI which required pharmacist intervention. Application of significance ratings to potential DDIs identified 68 (26%) potentially severe risk DDIs. A significance rating of caution was applied to the remaining 74% (198/266) of DDIs identified. The most frequent recommendations following PTPA to facilitate management of potential DDIs were the initiation of a monitoring plan (30%), switching an interacting medication to an alternative (20%) and alteration of dosing administration times (24%). Significantly more patients (78%) with three or more co-morbidities at baseline were subject to a least one potential DDI. The odds of a potential DDI was significantly associated with concomitant cardiovascular disease (OR 9.11, 95%CI 3.02, 27.52) and co-infection with HIV (OR 4.65, 95%CI 1.65-13.08).

Conclusion

The potential for DDIs with new DAA based HCV therapies using the PTPA intervention based on the results of this study is high. Risk factors include the number of co-prescribed medications and presence of co-morbidities. Clear recommendations to aid healthcare professionals treating patients for HCV infection permits appropriate treatment and care of patients without compromising optimum patient outcomes. Refinement of the pharmacist-led pre-treatment intervention will evolve as new regimens become available, aiding appropriate and quality driven pharmaceutical care of all patients treated for HCV infection.

References

1. Coghan M. Procedure for Drug Interaction Checks for Hepatitis C Patients. Pharmacy Department, St. James’s Hospital; 2015. SOP No. HCV 001.

This study did not require ethics approval.

10. Audit of Countess of Chester Hospital NHS Foundation Trust IV Vancomycin Guidelines

Michael Cooper, Ceri Davies, David Breen, Countess of Chester NHS Foundation Trust, Chester

Background

Vancomycin is a glycopeptide antibiotic used for the treatment and prevention of infections caused by gram positive bacteria1. Assessment of renal function using the Cockcroft and Gault equation2 is necessary to determine IV dosing. Trough blood-plasma concentrations are monitored during treatment to assess safety and efficacy. Previous audit work in 2011 demonstrated only 30% of patients achieved target trough blood-plasma concentrations; in response trust guidelines were revised. Under-dosing patients may lead to antimicrobial resistance and treatment failure with concentrations in excess of the target potentially exposing the patient to side effects such as nephrotoxicity and ototoxicity3. Consequently, re-audit to assess practice was required.

Objectives

- Determine prescribing compliance with trust IV vancomycin guidelines
- Investigate the extent to which target trough blood-plasma concentrations are achieved at the first trough blood-plasma concentration
- Identify potential barriers to compliance with vancomycin guidelines
Method
Data was gathered retrospectively over two months using computer generated reports on vancomycin concentrations. Prescriptions were audited against trust IV vancomycin guidelines. Ten prescribers, from a range of specialities and seniorities, were interviewed to ascertain opinions on vancomycin guidelines. Prescribers participated voluntarily in response to a whole hospital invitation. This study required and received ethics approval.

Results
- In total 43 patients were eligible for audit
- Doses were prescribed as specified in guidelines for 25 of 43 patients (58%) with 12 of these patients (48%) achieving target trough blood-plasma concentrations
- 18 of 43 patients (42%) were prescribed a dose not specified in guidelines with 3 of these patients (17%) achieving target trough blood-plasma concentrations
- Four doctors (44%) stated further training as a method of service improvement

Conclusions
Prescribers stated a lack of confidence and/or familiarity with the Cockcroft and Gault equation which established a barrier to guideline compliance. Consequently, 42% of patients received a dose outside of trust guidelines. When patients were prescribed doses not specified in the guidelines they were less likely to achieve target trough blood-plasma concentrations (17% vs 48%). Further education for prescribers focusing on accurate determination of renal function is required to ensure guidance is followed and optimal numbers of patients achieve target trough blood-plasma concentrations.

When dosed according to guidelines 52% of patients did not achieve target trough blood-plasma concentrations. Trust IV vancomycin guidelines are presently under review with the intention of optimising the dosing algorithm to ensure best practice. Guidelines will be re-audited within one year of revision. Data on patient outcomes was beyond the remit of this audit; therefore, the clinical significance of these results cannot be fully quantified.

References

Analgesic use in liver impairment – a consensus study
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Background
Pain management in liver disease is a clinical challenge. Evidence regarding analgesic use is limited and local guidance is non specific, often advising to seek senior medical or pharmacy input. A local point prevalence study has shown variable and contradictory practice. In light of the limited evidence and variable practice, a consensus study was undertaken to inform the development of more detailed guidance.

Objectives
- To gain consensus opinion amongst a multi-disciplinary expert panel on appropriate prescribing of paracetamol, dihydrocodeine, tramadol and ibuprofen in patients with liver impairment.

Methods
A systematic literature search regarding the use of paracetamol, dihydrocodeine, tramadol and ibuprofen in patients with liver impairment was undertaken using MEDLINE and EMBASE databases. Nine clinical scenarios covering a range of acute (n=4) and chronic (n=5) liver diseases were developed with the aid of data from a previous point prevalence study, a hepatologist and clinical pharmacists. The scenarios were incorporated into a survey which was piloted prior to use in a 2-round Delphi study, exploring the appropriateness of prescribing paracetamol, dihydrocodeine, tramadol and ibuprofen. A 16 member multi-disciplinary panel consisting of consultants, specialist nurses and pharmacists working in gastroenterology, anaesthetics, palliative care and surgery was recruited to participate. An adapted version of the RAND Appropriateness method was used for defining consensus.

Results
Consensus suggested that paracetamol, dihydrocodeine and tramadol can be used safely, without dose reduction, in patients with chronic liver disease without cirrhosis. Reduced doses should be used in Child-Pugh category A&B cirrhosis but their safety is unclear in category C. Ibuprofen should be avoided in patients with cirrhosis of all severities.

Conclusion
The results of this study suggest that expert consensus exists for analgesic use in some forms of liver impairment but uncertainty remains in others. Simplified clinical scenarios may not be entirely representative of clinical practice; however, the results provide a strong foundation on which to prepare more specific local guidance for this challenging clinical area.

References
Background
Tight blood glucose control is essential in patients with diabetes. Appropriate monitoring of blood glucose supports optimisation of treatment which in turn reduces duration of hospital stay and prevents long term complication of diabetes. Currently there is no guidance for nursing staff at WUTH on how often to measure blood glucose levels.

Aims
• To determine if patients with diabetes are having their blood glucose checked at the appropriate frequency.
• To identify how confident nursing staff feel in determining how frequently to monitor blood glucose in patients with diabetes depending on their medication regime and clinical status.

Method
This study required and received ethical approval. Prior to the study best practice criteria for blood glucose monitoring in patients with diabetes were developed by the diabetes multidisciplinary team. Data were collected over a two week period. A daily report of all patients with diabetes was generated using the electronic prescribing system. The two investigators reviewed each patient daily; recording which antidiabetic medication they were receiving, blood glucose measurements taken and any indication for increased monitoring. Appropriateness of blood glucose monitoring was determined by comparing the frequency of blood glucose measurements taken with the agreed best practice criteria. After the data collection period nurses were given an anonymous questionnaire asking them to rate their confidence using a seven point Likert scale in determining how often to measure blood glucose for the different antidiabetic medications.

Results
There were a total of 211 patients monitored during the two weeks providing 1043 days of blood glucose monitoring. Forty-six days were excluded from the study as the patients were receiving continuous intravenous insulin infusions. Thirty percent of days were monitored appropriately according to best practice criteria. The reasons why blood glucose was not monitored appropriately were: blood glucose not checked frequently enough (46% of days), blood glucose checked too often/at inappropriate times (12% of days), blood glucose out of range and not rechecked (11%), hypoglycaemic event not managed correctly (1%).

Thirty eight nurses completed the questionnaire, a response rate of 30%. Nurses were most confident in determining how often to measure blood glucose in patients on metformin, sulphonylureas, insulin and in diet controlled patients and least confident in patients on dipeptidylpeptidase inhibitors, pioglitazone, dapagliflozin and exenatide.

Conclusions
Monitoring of blood glucose in patients with diabetes is poor in the Trust with insufficient checking of blood glucose being the largest problem. Even though nurses identified higher confidence scores in determining when to measure blood glucose in patients taking metformin, sulphonylureas and insulin there was still significant under checking in these patients. The results of the study identify the need to formalise the best practice criteria into a Trustwide approved guideline which should then be promoted and audited annually. A limitation of the study was the need for the investigator to identify if the patient was clinically unwell which then changed the frequency of blood glucose monitoring required. Although there were criteria to measure this against the decision was subjective in part in some cases.
Background
Pharmacists make a number of interventions within daily practise however, the documentation of interventions within medical records is limited due to a number of barriers including; time, fear of criticism and litigation. Within our Trust some guidance exists but is insufficient as demonstrated by inconsistencies within current documentation practice amongst critical care pharmacists; using the electronic prescribing system (ICCA). One month prior to the audit, a round table discussion using national resources led to the production of guidance and standards on documenting interventions.

Objective
To determine compliance of documenting interventions in the medical notes in line with the standards.

Standard(s)
1. 100% of entries should be in line with ‘Standards for pharmacists documenting in electronic medical notes’
2. 100% of entries must be in chronological order and as timely as possible.
3. 100% of entries must include the pharmacist’s full name, contact details and speciality.
4. 100% of entries must follow the SBAR (situation, background, assessment, recommendation) structure.
5. 100% of entries must include the full name and designation of the doctor/nurse the issue was discussed with.

Method
Data was generated and collated into a centralised spreadsheet from the weeklong clinical intervention audit in November 2015. Interventions from all adult critical care wards were extracted and collated into our data collection spreadsheet. As per the standards, each intervention was evaluated to ascertain whether it was appropriate to document and then assessed against our standards. This audit did not require ethics approval.

Results
Over the week, a total of 274 interventions were made; 102 of which were documented within the medical notes on ICCA. In line with the guidance, only 32 interventions should have been recorded, yet 69 (25%) interventions not documented during the week, should have been. Compliance to the standards: 32% for standard 1, 100% for standard 2, 16% for standard 3, 16% for standard 4 and 55% for standard 5.

Discussion
The results show poor compliance with the standards set for when and how interventions are documented. Only 6% of documented interventions met all standards. 70 interventions need not have been documented; leading to 12 hours of extra time spent (assumption: 10 minutes per documentation).

Further work is needed to redefine the standards and clarify clinically significant interventions within the guidance document.

References
4. RPSGB. Professional Standards for Hospital Pharmacy Services- Optimising Patient Outcomes from Medicines. 2014 p10 (section 2.3).

15. Evaluation of Prescribing Pharmacists in Theatres: Improving Medicines Reconciliation for Elective Surgical Patients
Solanki S, Dhillon K, Northampton General Hospital, Northampton

Context
The National Institute for Health and Care Excellence (NICE) describes medicines reconciliation as a process whereby an accurate list of a person’s medicines (including prescribed, over-the-counter and complementary medicines) is obtained within 24 hours of admission or sooner if clinically necessary.

Problem
A recent audit within the trust identified that in 50% of cases, transcription of medicines by a doctor for elective surgical patients had not taken place within 24 hours, potentially encouraging patients to either self-medicate or omit critical medicines therefore increasing the risk of harm. Prescribing regular medication at the time of pre-assessment had been considered however the period of time from assessment to admission varied with the potential for medication changes to occur in the interim.

Intervention
The aim was to support and improve medicines reconciliation through the introduction of prescribing pharmacists in Main Theatres Admission Unit (MTAU). Anaesthetists, surgeons and nursing staff were involved in identifying and developing the proposed role. It was agreed that a pharmacist prescriber would work alongside the existing team in MTAU, which operated on patient under the care of maxillofacial, urology or general surgery from the 04/01/2016 to 29/01/2016 (weekends excluded). To improve accuracy, a review with the patient occurred during the morning of surgery to re-confirm their regular medication and to ensure that advice given pre-operatively was clearly followed. Medication was then prescribed accordingly by a pharmacist whilst also taking into account post-operative instructions for high risk medicines such as anti-coagulants and anti-hypertensives management. Surgical ward based pharmacists were advised to clinically screen prescriptions as usual and to raise any discrepancies through normal feedback mechanisms.

Effects of change
A total of 671 regular medicines were assessed and prescribed for the 118 inpatients included in the pilot. Over the four week period, medicines reconciliation targets were achieved as 100% of patients were reviewed within 24 hours, 74 clinical interventions were made and 27 medicines were
identified as newly prescribed between the time of pre-assessment and surgery. This included a newly diagnosed insulin dependent diabetic and the initiation of beta-blockers for atrial fibrillation. Feedback from ward pharmacists included fewer discrepancies; a reduction in time spent prompting doctors to prescribe regular medicines and increased accuracy of discharge summaries by doctors due to complete medicines reconciliation.

Conclusion
Medicines reconciliation reviews were conducted prior to anaesthesia as opposed to post-operatively, a time when patients may be drowsy or unable to reiterate accurate information. Subsequently this improved safety as critical medicines were prescribed in a timely manner whilst also reducing the risk of missed doses.

Limitations identified included future implementation. The prescribing pharmacists had a thorough understanding of the elective care pathway with experience in both surgical pharmacy and within the pre-assessment clinic. This level of competence may not be reproducible as extensive training would be required to cover more than one theatre.

References

16. Antimicrobial Stewardship Audit 2016: De-escalation of intravenous antibiotics
Young T. Doherty S., Wirral University Teaching Hospital, Wirral

Background
The ‘focus’ part of the Department of Health (DOH) Antimicrobial Stewardship guidance ‘Start Smart, then Focus’ emphasises that antibiotics should be reviewed within 72 hours of starting. Upon review, the antibiotic should either be stopped; switched from IV to oral; changed in response to microscopy, culture and sensitivity (M,C&S) results or continued until a specified stop date or further review. The outcome should be documented in the patient’s medical notes.

Objectives
The aim of this audit was to investigate whether antibiotic prescribing at Wirral University Teaching Hospitals follow the ‘focus’ part of the DOH’s ‘Start Smart, then Focus’ guidance.

Objectives were to determine:
1. The percentage of IV antimicrobial initiations in which the 72 hour antimicrobial review occurred.
2. The proportion of patients prescribed antibiotics for whom (MC&S) specimens were collected and whether results were documented.
3. The proportion of “focus” reviews documented in the medical notes.

Method
This was a re-audit of last year’s de-escalation of IV antibiotics audit. Fifty three patients who received IV antibiotics in a six week period in January-February 2016 were identified via the Trust’s electronic prescribing system (EPS). Patients’ medical notes were reviewed 72 hours after commencement of antibiotics to determine whether a review had taken place and what the outcome was. The EPS was interrogated to identify whether culture and sensitivity samples had been taken and if a course length had been prescribed.

Results
Within 72 hours, 89% of IV antibiotic prescriptions had a documented review in the medical notes. Culture and sensitivity samples were collected for 77% of patients. Although 92% of results were available within 48 hours, only 61% of these results were documented in the medical notes. Course lengths of antibiotics were documented on the prescription in 65% of cases, but only 31% of cases had them documented on both the prescription and medical notes. Last year’s audit determined the number of reviews within 48 hours. There was an increase in the number of patients who were stepped down from IV to PO (6% at 48 hours in 2015 versus 29% at 72 hours in 2016). The patients without a review at 72 hours was similar between the two years (10% in 2015 and 11% in 2016) as was the number of patients switched to more narrow spectrum agents (2% at 48 hours in 2015 and 6% at 72 hours in 2016).

Conclusion
There is still scope for the Trust to improve its implementation of the ‘focus’ element of the (DOH) Antimicrobial Stewardship guidance. The results suggest an improvement in the prescribing of IV antibiotics compared to last year’s audit in the area of the actions taken at 72 hour review. Future recommendations include adding a prompt on the EPS to include the indication for antibiotics and to send MC&S samples, and discussing antimicrobial stewardship during mandatory training.

This audit did not require ethical approval.

References
17. Evaluation of Pharmacist Intervention on Patients Admitted via a Surgical Admissions Lounge (SAL)
Sarah Morris and Alan Field, *Salford Royal NHS Foundation Trust, Salford

Introduction
SAL is the unit elective surgical patients are admitted to prior to surgery. Prior work in February of 2015 identified that admission to hospital through SAL prolonged the time to beginning the medications reconciliation (MR) process, prolonged the time taken for pre-admission medications to be prescribed and resulted in missed doses of pre-admission medication. Since April 2015, a pharmacist now visits the SAL each weekday morning to begin the MR process. The impact of the pharmacists' role on the SAL was examined with respect to the above parameters. Furthermore, this project has since expanded to include the impact that pharmacist prescribing has had on missed doses. This study did not require ethics approval.

Aim
To evaluate the pre-surgery introduction of a pharmacist to patients’ care admitted via SAL.

Objectives
1. To compare the time to MR process pre- and post- initiation of a pharmacist visit to SAL.
2. To compare the time taken for pre-admission medication prescribing pre- and post- initiation of a pharmacist visit to SAL.
3. To identify the number, and cause, of missed doses for pre-admission medication.

Method
All elective surgical patients, with an inpatient stay of ≥24hrs, admitted via SAL over a one week period in November were identified. Data for pre-admission medications, the time to prescribing of these and reasons for missed doses was collected electronically by a pre-registration student and collated on Microsoft Excel®. A further 4 week trial of Pharmacist prescribing for selected patients admitted through SAL was conducted throughout the month of April 2016.

Results
94 patients out of a total 191 (49.2%) fitted the inclusion criteria. 90 (95.7%) patients had a Mr during their inpatient stay, 81 (90%) of these were started in SAL. The overall time to starting a MR for all patients has greatly improved, 88.3% were within 24 hours compared to 4.5% prior to a pharmacist on SAL.

Collectively, the 94 patients were on 462 pre-admission medications, 192 (41.5%) of these had one or more missed doses, amounting to 368 medication doses missed. The predominant reason for this was medications not being prescribed (77.2%).

Results for the impact of the April 2016 prescribing trial are pending.

Discussion
This project showed a shortening of the time to beginning a patient’s MR, with 88.3% being within the 24hr time-frame recommended by the NICE®. However, there is only a small decrease in the time taken to prescribe patient’s medications resulting in a continued high amount (368) of missed doses.

Conclusion
A positive impact to MR figures from introducing a pharmacist visit to the SAL is evident. Despite this, there is only a small decrease in time to pre-admission medication prescribing. Therefore, the results from the impact of pharmacist prescribing are eagerly anticipated.

References
1. Abdulameer, S. Review of the prescribing and administration of regular pre-admission medications in elective surgical patients admitted via the surgical admissions lounges. 2015

18. Venous Thromboembolism Prophylaxis with Tinzaparin for Patients over 90kg in Critical Care
Susan Firbank, Nicola Rudall, Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne

Background
Patients admitted to Critical Care units have a higher risk of developing a venous thromboembolism (VTE) than the standard medical patient population. Obesity is also recognised as an independent risk factor for VTE but standard dose VTE prophylaxis is less effective in obese patients. Newcastle upon Tyne Hospitals Trust Critical Care guidelines for VTE prophylaxis indicate that patients should be given 3500 units or 4500 units tinzaparin daily depending on risk factors; 4500 units should be considered for all patients over 90kg, with doses increased in patients above 120kg.

Objectives
To carry out a retrospective audit of prophylactic tinzaparin dosing in patients over 90kg on the Freeman Hospital ward 37 Critical Care unit for two months in 2015 to establish if patients are being managed in line with the Trust Critical Care guidelines.

Method
The patient lists for August and September 2015 for ward 37 were obtained and patients with a documented weight in the pharmacy system identified. Those with a weight of 90kg or more were then selected for further analysis. Using the pharmacy Critical Care notes and the NUTH electronic prescribing system, relevant data were extracted. The information collected was analysed to assess the given doses of tinzaparin and evaluate if appropriate dose choices had been made for each patient according to Trust guidelines. This study did not require ethics approval.

Results
131 of the 245 patients had their weight documented. 31 patients had a weight of over 90kg and prophylactic tinzaparin was suitable for 26 of these. Of the 26 patients: tinzaparin was stopped or an alternative anticoagulant given in 5 (19%) patients (1 stopped for palliation, 4 reverted to pre-surgery anticoagulation); remained unchanged in 8 (31%) patients (4 post renal surgery, 1 bleed, 1 bleeding risk, 2 correctly prescribed 4500 units); and was increased in 13 (50%) patients, indicating that 50% of these patients had previously been prescribed a subtherapeutic tinzaparin dose.

Conclusions
The results of this audit indicate that a significant proportion (50%) of patients over 90kg arriving in Critical Care are being given inadequate VTE prophylaxis. Factors that may contribute to under-dosing include a lack of national and Trust-wide dose-specific guidance and a lack of awareness by
prescribers that higher doses are required in patients over 90kg. The development of Trust-wide guidance that includes VTE prophylaxis dose guidelines, along with a prompt in the electronic VTE assessment tool to consider weight when prescribing VTE prophylaxis, are recommended to improve thromboprophylaxis in patients over 90kg. A re-audit will evaluate implemented changes.

References

Goh C, Dave K, Le Morgan N, Medicines Management Department, Central London Community Healthcare NHS Trust, London

This study did not require ethics approval.

Context
The North West London Integrated Care Programme (NWL ICP) Innovation Fund was set up to test new integrated services for high risk patients, with a view to reducing non-elective hospital admissions. A local review of London Ambulance Service (LAS) calls outs and audit of selected care homes showed inequity of provision and access to services.

The Central London Community Healthcare NHS Trust (CLCH) was commissioned to deliver improved proactive integrated care to care home residents, including better co-ordination, targeted interventions and multidisciplinary approach with existing community and specialist services.

Problem
Seventy percent of care home residents experience at least one medication error. In addition 50% of medicines are not taken as prescribed, with adverse drug reactions contributing to 17% of all hospital admissions. All health and social care professionals especially pharmacists have to manage these challenges as described in the NICE quality standards on medicines management in care homes.

Intervention / Measurement of improvement
Two Senior Band 8a Clinical Pharmacists provided level 3 clinical medication reviews, cost saving interventions, audit to minimise medication errors, training to care home staff and contributed to monthly multidisciplinary meetings. All interventions made were recorded and incident reports completed where significant.

Effects of changes
The preliminary results from December 2013 to December 2014 showed 6414 interventions were made for 981 residents, with 126 of grade IV (Reversible harm or admission to hospital) and 1 grade V (Averted death or major permanent harm) with total net cost savings of £170K per annum by stopping medications not indicated. The grading tool was adapted from King’s College NHS Foundation Trust. Using Statistical Process Control, the project team began to see trends of reduction in falls (35%), ambulance call outs (26%), Accident and Emergency attendances and hospital admissions (16%) since the project started compared to the previous year. Also positive qualitative feedback from care home staff, practices and residents was collected independently from the Collaboration for Leadership in Applied Health Research and Care North West London which showed the benefit of care homes pharmacists.

Conclusions
The project has begun to show the intended outcomes. The contributions made by the pharmacists not only improved pharmaceutical care, they made the service almost cost neutral. This project is ongoing with the vision of sustaining it for all the care homes residents.

References

20. Medicines reconciliation: Does it reduce length of stay?
Green CF, Kenyon J, Rowe PH, 1Pharmacy Department, Countess of Chester Hospital NHS Foundation Trust, 2School of Pharmacy and Chemistry, Liverpool John Moores University

Background:
Medicines reconciliation (MR) is an important part of the patient’s hospital admission and is noted as such in NICE guidance. While it is clear from the literature that MR is an important opportunity to ensure patients’ medicines are correctly listed and subsequently prescribed, there is little evidence to support its effect on length of stay (LOS).

At the Countess of Chester Hospital NHS Foundation Trust (COCH), an integrated e-prescribing and patient administration system (Meditech v5.6.4) allows clinical pharmacy staff to electronically log when MR has been completed for each patient.

Objectives:
To retrospectively review admissions to our hospital and ascertain whether there is any correlation between the time of MR after admission and LOS.

Method:
Data were extracted from the Meditech system and manipulated using Microsoft Excel and then imported into SPSS for of statistical evaluation. All patients with a LOS greater than 24 hours were included in the study; patients with a LOS less than 24 hours, those admitted for day surgery or to the ED and all paediatric patients were excluded. Patients were grouped into those that had their MR completed within 1, 2, 3, 4 and more than 4 days
after admission. Initial data analysis was used to calculate median and inter-quartile range (IQR) values for each group, and then survival analysis was also used to identify the proportion of patients in each group that remain in hospital on a certain day after admission. This study did not require ethics approval.

**Results:**
Data were collected for 13,300 patients admitted over a calendar year. For patients with MR within:

- 1 day, the median & IQR for LOS was 3.3 & 1.6-8 days (5266 patients)
- 2 days, it was 4.1 and 2.2-9.2 (4704 patients)
- 3 days, it was 6.5 and 3.8-12.9 (1992 patients)
- 4 days, it was 7 and 4.7-14.5 (982 patients)
- and for LOS greater than 4 days it was 8.3 and 6.1-17.1 (507 patients)

Although the median & IQR for LOS increased as the time between admission and MR grew, this is possibly a result of bias in the methodology. Data were then analysed using survival curves, which did not show any differences in the time patterns of discharges for patients, whether their MR took place earlier or later during their hospital admission.

**Conclusions:**
Although the median and IQR for LOS rise as the gap between admission and MR grows, this might be a function of longer LOS, not when MR took place. Using survival analysis and our method of retrospective data analysis, it would appear that MR, despite being a key element of the patient journey through the hospital system and an important patient safety opportunity, does not influence patients’ LOS.

**References.**

### 21. Compliance with microbiological sampling prior to commencing empirical therapy for urinary tract infections

Mohammed Gul and Danielle Stacey, the Dudley Group NHS Foundation Trust, Dudley

**Background**
In August 2015, The National Institute for Health and Care Excellence (NICE) published ‘Antimicrobial stewardship’ under antimicrobial prescribing it stated ‘for patient’s in hospital who have suspected infections, take microbiological samples before prescribing an antimicrobial and review the prescription when the results are available’.

Public Health England in March 2015 published an update ‘Start Smart - then focus’. This stated ‘cultures should be obtained prior to commencing antemicrobial therapy, where possible’.

In light of the above, an audit was undertaken at the Dudley Group NHS foundation Trust.

**Objectives**
All males:
1. Diagnosed with a urinary tract infection (UTI) have documentation in the case notes or the medication chart.
2. With a symptomatic UTI have cultures prior to commencing therapy.
3. Are initiated on therapy according to microbiology guidance/advice.
4. Have therapy amended as per culture findings.

**Method**
The audit did not require ethics approval, however, approval was required from the Trust audit committee. Data were collected from prospective and retrospective case note reviews. The microbiology department produced a list of patient’s between 01/01/16 and 10/02/16. A random number generator was used to select a target sample size of n=40. Prospective cases were n= 24 and retrospective cases were n=16. Data collection commenced on 19/01/2016, finishing 24/05/2016.

**Results**
Criteria one achieved 85%, criteria two 65% and criteria three 87%. Criteria four was excluded from data collection (for further information, refer to the discussion section).

**Discussion**
Non-compliance for criterion two was seen with n=5 cases. These were discussed with individual prescribers, found an unawareness that cultures were routinely considered for male patients who presented with UTI. This suggests a degree of disparity between doctors, where some have considered cultures and others have not.

The Trust antimicrobial guideline states, before escalating to second line for male UTI ‘review urine cultures’.

A recommendation was made to clarify the guidelines with the microbiology team within 4 weeks.

A limitation of the audit must be stressed, criteria four was excluded during the audit, this was due to time constraints.

**Conclusion**
Compliance was not found with sampling prior to commencing empirical therapy for UTI, as this is not stipulated within trust guidelines.

**References**
Background
The Immediate Discharge Letter (IDL), typically written by junior medical staff, serves as both a discharge prescription and a communication to GPs outlining the care provided. Previous work revealed an average of 2.5 medication-related issues per IDL requiring correction or clarification following review by a clinical pharmacist. The high level of issues increases the likelihood of medication errors on discharge and inadequate communication to GPs. The purpose of this study is to explore the reasons for IDL errors and to develop methods for preventing their future occurrence.

Objectives
This study was conducted to re-examine the frequency and types of issues arising on clinically screened IDLs, establish where in the system they originate, determine their root causes, and devise solutions that will reduce the rate of IDL issues.

Methods
Pharmacists on medical wards at GRI documented any medication issue that arose for each IDL screened over one week. Issues were categorised according to the intervention required, namely documentation, change, monitoring, or supply. The information source where each issue originated was determined by reviewing the patient’s Kardex, medicines reconciliation, notes, and emergency care summary. If the information in each source was correct, the source was determined to be transcription onto the IDL. A small group discussion was conducted with junior doctors to determine root causes and potential solutions to IDL issues. This study did not require ethics approval.

Results
Of the 49 prescriptions screened, 80% contained at least one issue. 122 issues were identified thereby producing an average rate of 2.49 issues per IDL. 38.5% of issues required further relevant information to be documented on the IDL, while 51.6% of issues involved changing the prescription to make the medication clinically appropriate, the most common of which being incorrect or incomplete dosing instructions (39.7%), drug omissions (20.6%), and incorrect drug selection (15.9%). Transcription onto the IDL was determined to be the source of the error for 85% of the issues. The most common root causes identified by junior doctors include time constraints, interruptions, illegible/unclear patient notes, multi-tasking, and transcription errors. The electronic prescription software was determined to be the source of the error for 10% of the issues. Potential solutions include having more rigorous training in the prescription writing software by more relevant staff (i.e., doctors/pharmacists), implementing an error-reporting/feedback system, allowing “protected time” for doctors while writing IDLs, and creating a system that electronically transfers patient’s medication onto IDLs.

Conclusion
This and previous studies exploring error rates on discharge prescriptions have highlighted an urgent need for corrective and preventative action, particularly aimed at junior medical staff. Solutions that focus on improving transcription of medication onto IDLs could reduce incidents of avoidable harm to patients and improve the quality of care provided to patients. Results of this study have been presented to a local clinical governance committee who agreed “protected time” is to be considered. Systems will be re-audited once solutions are implemented.

References

Context
This project, undertaken in elective surgical patients at a large NHS Teaching Hospital included general surgical, orthopaedic, urology, gynaecology and special surgery patients. Nursing, Anaesthetic, Surgical and Pharmacy teams were consulted and supportive of this project.

Problem
Currently Pharmacy responds to referrals for clinical advice from pre-operative clinic. Medicines reconciliation and supply functions are undertaken post-operatively at ward level. This potentially leads to:
- Sub-optimal medicines use peri-operatively due to unidentified drug interactions between anaesthetics and regular medicines
- Undesirable pharmacology of regular medicines during surgery, for example perioperative bleeding caused by aspirin
- Delays in prescribing regular medicines leading to missed doses post-operatively and unnecessary re-supply. A high proportion of prescribing and dispensing is undertaken out of hours by on call teams.

Intervention
The Surgical Division agreed to assess the impact of a Prescribing Pharmacist and Pharmacy Technician within SEAL. Their role was to undertake medicines reconciliation pre-operatively at the point of admission; including prescribing regular medicines when clinically indicated, assessing patients’ own medicines for use during hospital stay and alerting the surgeon to patient non-compliance with the pre-operative medicines plan.

Effects of Changes
During a four week period (November 2015) 164 patients were seen, 890 patients own medicines prescribed and 823 deemed suitable for use. Results demonstrated;
- Reduction in mean time of admission to completion of medicines reconciliation from 29 hours 40 minutes to 95 minutes
- Reduction in mean time to generate the patient’s complete prescription from 36 hours 21 minutes to 93 minutes
- Reduction in mean number of regular medicines supplied from 2.33 to 1.19 per patient. Associated mean medicines costs reduced from £11.26 per patient to £2.49, leading to an estimated yearly saving of £17,259.
- The Pharmacist made 28 clinical interventions (17% of patient population). Half of these identified a need to amend the surgical plan.
- Ward based medical, nursing and pharmacy teams were positive about the impact of this service, reporting reductions in medicines related workload and a perceived increased ability to provide direct patient care. They also suggested there were improved patient outcomes though reduction in missed doses and an improvement in quality of prescribing, as patients’ pre-existing medications were defined and available for use.
- The proportion of patients that had a medicines reconciliation performed during their hospital stay increased from 90% to 100%
• Prescribing of patients’ regular medication out of hours by on call teams was reduced from 10% to 0%.

Conclusions
This positive effects of having a Surgical Admissions Pharmacy Team demonstrated by this study have led to this being considered the optimum way of providing medicines management services to elective surgical patients.

Future planned work is to:
• Quantify the reduction in missed doses and stratify their clinical significance.
• Quantify the time saved by ward based teams on medicines related activity.

This study did not require ethics approval.
Results

The trust NMP contact list contained 176 members of staff who all received the link to the online survey. By the closing date 51 NMPs (36 nurses, 7 pharmacists, 4 physiotherapists, 3 radiographers and 1 midwife) completed the survey (a response rate of 29%) of which 20 had been a qualified NMP for at least 5 years. An audit of NMP practice was declared for 19 prescribers (37%), 74% of whom represented retrospective audit and 26% prospective audit. 12 of those who audited their practice used standards around the legal aspects of prescribing. Audits were most commonly performed by work colleagues of a different profession to the NMP being audited. Respondents felt that examples of audits (80%), collaboration with a colleague (75%) and the use of standard audit templates (69%) would be the most beneficial to facilitate routine audit of prescribing practice. A variety of themes were identified around the benefits to the individual’s practice and barriers to routine audit (e.g. lack of time and guidance).

Conclusions

Limitations of the study include a truncated data collection to prevent the confounding factor of a regional NMP conference discussing audit practice. Audit of non-medical prescribing practice is not occurring consistently. Where audits have been undertaken there is strong multidisciplinary collaboration perhaps due to pharmacists undertaking prescribing audits on behalf of other professionals. Both the perceived limitations of time and limited availability of auditors may explain the high proportion of retrospective audits which are not time sensitive and can be performed at the auditor’s convenience. This aspect requires further exploration.

References


26. An audit of the storage and wastage of insulins at ward level
Manal Kamal, Gillian Cavell, Pharmacy, King’s College Hospital NHS Foundation Trust, London

Introduction

Insulin is a high-risk medicine. Insulin adverse drug events (ADEs) may cause serious patient harm. Common insulin ADEs include wrong dose, device or the type of insulin. Risks of ADEs may be compounded by poor storage of insulin products. Locally storage problems have been identified: ward refrigerators may contain multiple insulin products some of which may be redundant increasing the risk of mis-selection, use for multiple patients and wastage. We aimed to assess the management of insulins on wards across our hospital, a large NHS acute teaching trust, to identify ways to decrease the risk of error and reduce waste.

Objectives
To identify stock and patient’s own insulins at ward level.
To measure wastage of redundant insulin products.
To identify potential cost savings.

Standards
1. 100% of ‘patient’s own’ insulin products are labelled.
2. 100% of labelled insulin products are for patients currently on the ward.
3. 0% of insulin vials and devices still indicated are wasted.

Method

Data were collected on a piloted data collection form. All wards, except critical care wards, were visited once between 15th and 29th January 2016. Fridges were inspected. Details of insulin type, device, quantity, stock status, dispensed by the hospital pharmacy or patient’s own insulin and whether the patient was currently on the ward were documented and analysed. Insulins prescribed for patients but not being used were removed as wastage. The value was calculated using local purchasing prices.

Ethics approval was not required.

Results

The audit standards were not met.
Of 627 insulin products identified, 134 (21.4%) with a value of £938.22 were wasted.
Of 183 insulin pens, 25 (13.9%) were not labelled with patient’s details and 73 (40.56%) belonged to patients transferred to another ward or discharged.
Of 247 insulin vials identified, 6 were labelled for patients, 4 of whom had been transferred or discharged. Similarly of 196 insulin cartridges, 32 were labelled of which 20 (62.5%) belonged to transferred or discharged patients. Unlabelled vials and cartridges were assumed to be stock and in use.

Discussion & Conclusions

Storage of insulin products at ward level needs improvement to reduce insulin wastage and improve patient safety. Among those belonging to patients discharged from hospital, some were dispensed as a part of the patient’s discharge medication but not sent home with the patient. Training needs to be provided to health care professionals dealing with the storage and administration of insulin ensuring medications are transferred with the patients and all devices are labelled appropriately.

Although intended for single-patient use there is no way of identifying whether insulin pens have been used. The attachment of a tamper evident seal will help identify whether insulin pens are suitable for re-use. To reduce the risk of device sharing storage in patient’s own drug lockers could be considered.

This audit has identified potential cost savings if insulin storage on wards is reviewed to ensure patients are discharged with insulin devices labelled for them.

References

Background
Hospital pharmacy teams provide expertise on the choice, dosing and administration of medicines and ensure clinical areas have timely access to medicines. The provision of these services is required outside of normal pharmacy working hours with reduced staff. With the shift toward seven day working, we must evaluate current working practice and consider service redesign to improve patient outcomes.

Objectives
1. To understand the nature of calls received by pharmacy out of hours.
2. To consider pharmacy staffing levels between weekend and weekday services against workload.

Method
Retrospective data were collected from calls made outside of normal working hours (9am – 5pm Monday to Friday, 10:30-4pm weekends). 1,386 calls logged in a residency database spreadsheet over a six-week timeframe were categorised and analysed. This study did not require ethics approval.

Results
The results showed that the majority of calls were of a supply-based nature: on average 255 calls were logged each week. Of these, an average of 21% of calls were for requests to validate and supply medications on discharge and 37% of calls to supply medications for inpatients. Other calls included medicine queries and calls about logistics. Data was analysed to determine which days and which hours were busiest in terms of calls received.

There is an evident ‘weekend effect’ with the workload highest on Mondays and Fridays. The weekday out of hours staffing provision to handle these calls is an average of 1.5 pharmacists and 0.4 technicians. This is against a weekend average of 1 pharmacist and 0.2 pre-reg pharmacist.

Conclusions
Service reconfiguration could improve patient flow by looking at pathways of access to medicines. With calls focused on supply, there is limited capacity for pharmacists to provide clinical expertise in other areas and for focus on medicines optimisation. High workload at times of minimal staffing has implications on patient safety.

A limiting factor in data collection is the difficulty in logging in all received calls during busy periods, particularly on weekends when providing a ward service whilst holding the pager.

Recommendations to develop the residency service have been made. Options to support training and redeploy staff onto clinical areas to support medicines optimisation and supply medicines closer to the bedside should be explored to improve patient flow, safety and experience. National reports, including the drive towards providing seven day services should be considered as levers for service transformation to provide appropriate clinical pharmacy services every day of the week.

References
Special thanks to the Band 6 Pharmacists at this NHS Trust.

28. Interventions to improve intravenous fluid prescribing in a district general hospital
Lloyd, Kennett, Jade Singh, Grant Haldane, NHS Lanarkshire, East Kilbride

Context
This pharmacist led, district general hospital, multidisciplinary project focused on improving fluid prescribing in adult surgical inpatients. This study did not require ethics approval.

Problem
Baseline prospective audit data (50 patients) for surgical wards (Dec’14) measured against NICE guidelines showed poor compliance with fluid prescribing standards. Results showed compliance of 16% with sodium/chloride, 14% potassium and 38% glucose requirements. 44% were prescribed illegally, 16% had fluid management plans.

Poor peri-operative fluid management is linked to increased length of stay, morbidity and mortality. No Datix reports were generated despite poor prescribing compliance, highlighting lack of awareness of the issue. Initial difficulties included project engagement and teams acknowledging issues with intravenous fluid prescribing.

Assessment of problem and analysis of causes
Questionnaires assessing existing knowledge and attitudes were distributed to 46 doctors and 63 nurses (Jan-Mar’15). 39% of doctors and 65% of nurses stated that teaching was poor/unsatisfactory. 81% of nurses were not aware of guidelines for fluid management and 39% doctors felt guidelines were unsatisfactory.

Intervention/ Strategy for change/ Measurement of improvement
The initial interventions, April-May 2015, were one-hour education sessions (doctors, nurses, pharmacists). Key stakeholders within the hospital (surgical, pharmacy and nursing) were consulted to ensure uptake. Educational sessions were.

The education program improved practice with 44% of patients prescribed appropriate sodium/chloride and 84% glucose. 24% prescriptions were illegal but correct potassium prescribing remained low (18%) when re-audited in May 2015 (50 patients).

Further intervention was required and a new combined fluid prescription/balance chart and guideline were tested and implemented in a surgical ward in August 2015.

The combination of interventions resulted in improved IV fluid prescribing with compliance rates now 100% for chloride and glucose standards (96% sodium). Illegal prescriptions reduced to 4%. Documentation of fluid management plans and potassium remained low at 32% and 18% respectfully.

(Re-audited in Oct’15 - 25 patients)
Effects of changes
The effect of these changes has been increased patient safety through improved prescribing and documentation of fluids. The potassium prescribing issue has not yet been addressed and only 1/3 of patients have a fluid management plan.

Conclusions
This project had a big impact on fluids prescribing in surgical patients and reduces potential for patient harm. Lessons learned relate to underestimating the scale of the project and the impact that training would have on results. In hindsight a multidisciplinary group should have been established to share workload and improve engagement. Run charts would have given a clearer picture of sustained improvement. Future plans include expansion to remaining surgical wards and local hospitals. Further work is required on potassium prescribing and fluid management plans.

References

29. Implementation of pre-pack discharge medicines onto Urology and Elective Surgery wards
Anna Khan, Charlie Walker, Sophie Blow, Leeds Teaching Hospitals NHS Trust, Leeds

Context
Patient centred (1), is a key principle of the Leeds Way. The focus was to improve patient experience/satisfaction by reducing time patients wait for discharge medication. This was conducted at Leeds Teaching Hospitals NHS Trust (LTHT) on urology (J42) and elective surgical (J43) wards. It targeted surgical patients with a stay of <5 days, and no changes to regular medication. It involved multidisciplinary working; pharmacy, nurses, doctors and patients.

Problem
The length of time patients had to wait for discharge medication from pharmacy, resulting in some patients discharged at unsociable hours.

Assessment of problem and analysis of causes
A retrospective audit was performed to assess length of time for discharges to be processed by pharmacy, and the number eDANs (electronic discharge advice note) dispensed before and after 4pm. Average time for an eDAN to be processed was 139 minutes based on an audit of 22 eDANs between 1/10/15-30/11/15. The audit was performed 1/10/15 to 30/6/15; J42 processed 374 eDANs before 4pm and 477 after 4pm respectively on J43, 579 and 607. Multidisciplinary teams were consulted through focus groups to ascertain their thoughts on possible causes.

This study did not require ethics approval.

Intervention
Introduce a pre-pack medication cupboard, to stock routine post-operative medication, enabling nurse led discharge and at an earlier time.

Strategy for change
Pharmacists retrospectively reviewed eDANs and discussed with ward teams what medications were routinely prescribed post operatively; a ward stock list was formulated. Multidisciplinary teams were briefed over two weeks about proposed changes. A project nurse was involved to assess nurses’ competence to dispense medication, and re-enforce the nurse led discharge process. Ward huddles were used to brief all ward staff. Nurses’ only concern was an increase in workload; however overall benefits to patient care outweighed this. Wider benefits to the hospital were highlighted as improved patient flow through earlier and more efficient discharge.

Measurement of improvement
1) Number of eDANs bypassed pharmacy.
2) Time eDANs were processed, as a result of the implementation of pre-pack medication was audited using data recorded on Bluespier system.

Effects of changes
Since implementation the number of eDANs processed before 4pm has increased, by 10.3% on J43 and on J42 by 2.1%. This improved patient flow and resulted in patients being discharged sooner.

One issue that was encountered during implementation was the ward running out of pre-pack stock, resulting in discharge delays. This was addressed and the stock quantities were increased. This demonstrated the success of the project as it showed that the new system had been adopted.

Conclusions
Overall patients have benefited from this system as they no longer have to wait for discharge medication from pharmacy, represented by an increase in patients discharged before 4pm. The wider impact has been seen through improved patient flow.

A lesson learnt from this is that when introducing a new a process re-enforcing the process to staff is vital to ensure that the procedure is followed.

References
Background

The initiation of statins in patients who present with an acute coronary syndrome (ACS) is associated with reductions in recurrent adverse cardiac events and an overall reduction in all-cause mortality. National Institute for Health and Care Excellence (NICE) guideline recommendations advocate the use of more aggressive lipid lowering therapy with atorvastatin 80mg daily following an ACS. A follow up at three months should be undertaken to ensure treatment allows for a 40% reduction in non-high density lipoprotein (non-HDL) cholesterol (1)(2).

Objectives

As a group we aimed to determine whether:

1. 100% of patients have baseline lipid profiles (total cholesterol, HDL cholesterol, non-HDL cholesterol and triglyceride concentrations) measured on admission.
2. 100% of patients are initiated on atorvastatin 80mg once daily.
3. 100% of patients receive repeat lipid level monitoring at 3 months to determine if secondary prevention targets are achieved.
4. In patients who do not achieve the desired levels of reduction, an assessment of compliance and lifestyle advice has been undertaken prior to consideration of additional agents.

Methods

A retrospective audit was conducted across four cardiac centres within the West Midlands. This audit required and received ethics approval. Hospital IT systems were utilised to identify ACS patients and determine their baseline lipid profile. To determine whether patients were reviewed at 3 months as per NICE recommendations, general practitioners (GPs) were contacted. GP records were utilised to determine whether the patient’s lipid lowering therapy had been modified since discharge.

Results

64 patients were reviewed; 49 male (mean age 64 yrs) and 15 female (mean age 71 yrs). 36 presented with a STEMI and 28 with NSTEMI/UA.

Our results demonstrate:

1. A full lipid profile was available in only 11 (17%) patients on admission.
2. High intensity lipid-lowering therapy (atorvastatin 80mg daily) was initiated in 58 (90%) of patients.
3. The % reduction in non-HDL cholesterol could only be determined in 6 (9%) patients, of these <40% reduction was achieved in only 3 patients (4%).
4. Of the 58 patients initiated on atorvastatin 80mg daily, treatment remained unchanged in 52 (81%) patients. In 6 (9%) patients the dose of the statin was either decreased/stopped/changed, however the reasons were not documented.

Conclusion

Our findings indicate that, although appropriate treatment is initiated following an ACS event, regionally, we are not fully compliant with NICE CG181 recommendations regarding appropriate monitoring requirements on admissions or not at follow-up. As such we are unable to determine whether patients receive optimal lipid lowering therapy and therefore appropriate reduction of their cardiovascular disease burden.

Our work highlights opportunities for pharmacy teams to interact with local pathology departments and GPs to ensure appropriate monitoring takes place. Utilising pharmacists within post-MI clinics and GP surgeries will help to ensure ACS patients receive appropriate lifestyle advice and optimal pharmacological management including appropriate optimisation of their lipid lowering therapy.

References:

1. Cardiovascular disease: risk assessment and reduction, including lipid modification. NICE CG181; 2014.
2. MI secondary prevention in primary and secondary care for patients following a myocardial infarction. NICE CG172; 2013.

31. Improving patient flow and experience at Newham University Hospital (NUH), Barts Health

Shammi Khatun, Farrah Asghar, Tahirah Ali, Kyung Lee, James Mote, Bindesh Shastri, Champa Mohandas, Newham University Hospital, London

Background

The hospital operational resilience team wanted pharmacy to innovate ways to reduce patients’ length of stay.

Context

A two month pilot was initiated at Newham University Hospital (NUH), Barts Health, whereby a dedicated pharmacist and medicine management pharmacy technician (MMPT) were introduced to the medical post-take ward rounds (PTWR)(1,2) with the aim of improving patient flow and reducing patients’ length of stay in hospital by facilitating timely discharges. The pilot also aimed to improve patient safety by managing pharmaceutical queries during the post-take and aiding the transfer of information from admission to discharge.

Intervention

Patients under 75 were deemed more likely to be discharged on the same day than patients over 75 thus the under-75s PTWR was targeted by the pharmacist. The Pharmacy Discharge Team (PDT) consisting of a pharmacist and MMPT, collected daily intelligence from the bed managers on definite and potential discharges of patients from all wards. The discharge summaries which needed pharmacy verification were targeted and fast-tracked through dispensary by the PDT. The information was also communicated to ward pharmacy teams and they were supported by the PDT, prioritising patients on compliance aids and controlled drugs, and ensuring one stop dispensing of medication was completed to prevent delays. The number of discharge summaries (TTAs) completed by 3pm was a primary endpoint as this was agreed by the head of operations as a time frame which would show a reduced length of stay. Data was collected on the total number of patients identified as actual discharges, the number of TTAs in which the PDT intervened, and the number of TTAs ready by 3pm and 5pm. This study did not require ethics approval.

Conclusions

As a result of the PDT intervention, an average of 84% (13/15) of all identified TTAs were ready by 3pm. This is 44% higher than without any intervention from the PDT, as baseline data showed 40% (17/42) of TTAs would be ready by 3pm without the intervention. Baseline data was collected...
over one day, where the PTD did not intervene in eliminating potential from actual discharges therefore the total number of TTAs appear higher. Alongside this, the PDT assisted with the transfer of information regarding medication changes between wards and to GPs. Patients with changes in medication in their compliance aids were discharged safely and in a timely fashion. Together with the ward pharmacy team, the PDT was able to focus on counselling patients on any new medicines or changes and provide information to the care homes receiving patients and their carers. During the PTWNR, the pharmacist was able to provide pharmaceutical advice to the clinical team around medicines reconciliation, promote evidence based guidelines and formularies of medicines and supporting antimicrobial stewardship. The pharmacist also built strong working relationships with the clinical teams on post-take, who valued the input as part of the multi-disciplinary team.

References

32. Views on a hospital-based strategy to encourage patients to access medicines support post-discharge
Michelle Y.Y. Lam1, Linda J. Dodds2 and Sarah A. Corlett3 1. East Kent Hospitals University NHS Foundation Trust, 2. Medway School of Pharmacy, Universities of Kent and Greenwich at Medway, Chatham Maritime, Kent

Background
Discharge medicine use reviews (dMURs) provide medicines support to patients after a hospital admission. However, research has shown that in the South East uptake is low1. An initiative was introduced in April 2015 in one hospital to inform in-patients about the dMUR service at medicines reconciliation (MR). Patients were provided with a leaflet and encouraged verbally by the pharmacy team to access a dMUR upon discharge. The effectiveness of this initiative has been reported elsewhere. This study reports on the experience of implementing this initiative.

Objectives
To explore barriers and enablers to the implementation of a service to promote dMURs to in-patients, using the theoretical domains framework (TDF).

Method
Fourteen hospital pharmacy staff (pharmacists, pre-registration pharmacists and pharmacy technicians) whose role included performing medicines reconciliations (MR) were invited by e-mail to participate in a single focus group in June 2015. The topic guide was developed using the TDF (12 domains). The discussion was digitally recorded and transcribed verbatim. Transcripts were analysed using a framework approach. This study required and received ethics approval.

Results
Ten members (4 male) participated. No other demographics were collected. All participants were familiar with the purpose of the dMUR service (knowledge) and agreed dMURs could benefit certain patients (beliefs about consequences/anticipated outcomes). Patients were selected to receive dMUR information based upon their perceived need for medicine support and capability to benefit from the service. This was evaluated informally, based upon the patient’s cognitive and physical ability, reason for admission and if prescribed ‘high-risk medicines’ (inhaled, diuretics, cardiovascular medicines). Participants were realistic about the need to share responsibility for providing medicine support and had positive views about community pharmacists (CPs) providing a good service for patients which could benefit the Trust in reducing hospital readmissions (motivation and goals). The quality of the electronic discharge notification (eDN) was perceived as being critical to informing this process. Participants described competing pressures of MR targets and time constraints within their roles which impacted adversely on their ability to inform patients about their medicines, and quality assure eDNs (environmental constraints). dMUR leaflets were described as ‘quite good’ and ‘self explanatory’ but they were often unavailable to patients as they were locked away with their medicines (practical issues). MR was considered to be the best time to inform patients about dMURs. Participants suggested that all healthcare professionals should be informed about dMURs, leaflets should be more widely available and the eDN should advise patients if they have problems or require information about their medicines to visit their CPs.

Discussion
This study suggests that informing in-patients about the dMUR service at MR is feasible. The dMUR was perceived as a valuable service for patients provided the quality of information CPs received was accurate. The main study limitation was the small sample size of participants from one hospital trust.

References

33. The Patient Group Direction Policy and Procedure Compliance Audit
Langton.G, Herbert. K, Wirral University Teaching Hospital

Background
Patient Group Directions (PGDs) aim to improve access to medicines. They provide a legal framework to allow the supply and/or administration of specified medicine(s) by authorised healthcare professionals (HCPs) to pre-defined groups of patients with specified conditions without a prescription1. The legal requirements include; signatures of the development group, staff using them and managers deeming their staff competent to use the PGD. It is considered good practice to document the date, time, patient details, signature and a statement that the supply or administration was made under a PGD1.

Objectives
1. To determine the percentage of PGDs that are available, in date, approved and authorised for use within the Trust.
2. To determine the percentage of PGDs with complete signatures of HCPs and their line/clinical manager.
3. To determine the percentage of areas following recommendations for documentation.

Method
Relevant information was collected from wards and clinical areas that used PGDs throughout January 2016, using a standard data collection form. The results were divided into areas using Trust-wide PGDs and divisions who utilised their own PGDs (e.g. Diagnostics, Medicine, Surgery, Women and Children). This study did not require ethics approval.

Results
All 315 PGDs in use across the Trust were in date, approved and authorised. Only 26% of staff using the 186 Trust-wide PGDs had signed their relevant PGDs and only 9% of managers had signed to declare staff competent to use them. 96% of these PGDs met the recommendations for documentation. For the 129 PGDs in use within the divisions there was a compliance rate of 72% with staff signatures and 43% with manager counter signatures. Only 4.7% of these PGDs met the recommendations for documentation.

Conclusions
Although, 100% of PGDs were in date, approved and authorised, there was a low compliance with signatures and documentation across the Trust. There is need to educate and raise awareness with managers and to promote the importance of ensuring PGDs are signed and documentation complete. There may be opportunities for in-house online training to be developed, which would allow signatures to be recorded online and automated reminders sent if there is non-compliance. Increased use of the Trust electronic prescribing system (EPS) or implementation of a “PGD stamp”, (which is already being successfully used in one clinical area) may help to improve compliance with documentation recommendations.

Reference
1. Patient Group Directions [MPG2], National Institute for Health and Care Excellence (NICE), 2013.

<table>
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<th>34. An audit of the anticoagulants in extracorporeal dialysis circuits at Kings College Hospital</th>
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<td>Mubariz Mahmood and Mee-Onn Chai Kings College Hospital, London</td>
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Background
Parenteral anticoagulants such as unfractionated heparin (UFH) have a key role in successful haemodialysis. Continuous renal replacement therapy is known to activate the clotting cascade. When blood is exposed to tubing and filters (dialyser membranes) in the absence of anticoagulants, clot formation is likely. This precludes efficient dialysis and as clot formation progresses this will lead to a loss of dialysis access which means the patient is unable to dialyse. However with the shortage of heparin raw material worldwide, there has been a significant increase in the price of UFH plus drug supply is no longer reliable from wholesalers or manufacturers. Alternative anticoagulation such as the low molecular weight heparins (LMWHs) have been shown to be better than UFH. Enoxaparin is the LMWH of choice at Kings College Hospital and it is accepted by the renal division to move away from using UFH for all stable and non-acute haemodialysis patients.

Objectives
1. To assess if the prescribed dose of enoxaparin is effective for preventing clotting in dialysis circuits
2. To assess if UFH is appropriately used as per the local guideline
3. To ascertain if the prescribed dose of anticoagulant is effective

Method
This study did not require ethics approval. Approval was sought from the Research and Audit Group. Data collection was done prospectively on the main dialysis unit by using worksheets / renal database / nurses to identify the type of anticoagulant and to assess appropriateness. All the dialysis circuits were observed at the end of the dialysis sessions and clot formation was identified by visual inspection.

Results
In 13 dialysis sessions (over 8 weeks), 53 patients were assessed and 26 were on Enoxaparin (1st line) whereas 27 patients were on UFH (2nd line). For all the patients that were on UFH, none had a documented reason for why they were using a second line anticoagulant. From the 26 patients who were on enoxaparin 17 (65%) had clotted circuits at the end of the dialysis session. It was found that 10 of these were on a suboptimal dose of enoxaparin (less than 0.75mg/kg) and thus were preventable. Conversely in the UFH group there was clotting in 16/27 (59%) patients with the prescribed dose. None of these were on the maximum dose. A chi-square test was performed and no significant difference was found in the rate of clotting between UFH and Enoxaparin. X²(2, N = 53) = 0.325, p = .57. Underdosing in both arms may have affected the validity of such a result.

Conclusions
The rate of clotting observed was contributed to an incorrect perception of the importance of dose titration. The audit was unable to assess the effectiveness of the recommended dose due to widespread underdosing.

References
2) Renal Association Guideline for Haemodialysis: European Best Practice Guidelines for Haemodialysis 2002. suppl 7 (Part 1) 17

35. Usefulness of Naloxone trigger tool to confirm opioid related adverse drug events (ADEs)
Lena Uddin, Gillian Cavell and Deepal Mandaliya, Kings College Hospital NHS Foundation Trust

Background
An adverse drug event (ADE) is described by the European Medicines Agency as ‘a response to a medicinal product which is noxious and unintended’. In the UK the ADE trigger tool has been advocated for detecting adverse drug events associated with high risk drugs including opioids, by the Patient Safety First Campaign and more recently as part of the NHS Medication Safety Thermometer. Naloxone is an indicator of potential opioid related ADEs due to its direct relationship with reversing opioid toxicity. The aim of our study was to measure the sensitivity of naloxone as a trigger to detect opioid related ADEs in adult inpatients in an acute hospital.

Objective(s)
- To determine the incidence of potential and confirmed opioid related ADEs
- To assess the positive predictive value (PPV) of the Naloxone trigger
- To identify common drug/dose regimens associated with ADEs

Method
A retrospective case review of adult inpatients administered naloxone between (October 2014–September 2015) was conducted. Naloxone doses administered and documented within EPMA were included. A&E, adult and neonatal critical care wards were excluded.

A case review form was completed for each patient and presented to a multidisciplinary panel. The panel confirmed opioid ADEs using the World Health Organisation Uppsala Monitoring Centre (WHO-UMC) categorisation system. The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) Index was applied to confirmed ADEs to assign a severity of harm rating. Ethics approval was not required.

Results
One hundred and forty two naloxone triggers were identified: 140 cases which met the inclusion criteria were presented to the multidisciplinary panel. Fifteen cases were excluded. Of the 125 potential ADEs, 54 were confirmed as certain, 13 probable, 24 possible, 8 unlikely and 1 case conditional. Twenty-five cases were unassessable.

After application of the NCC-MERP Index, 90 cases were category E and 1 case was Category F. The positive predictive value after case review by the panel was 72.8% (91/125) compared to 89.3% (125/140) without multidisciplinary case note review. The incidence of confirmed opioid related ADEs was 1 patient per 3000 bed days. For confirmed ADEs, morphine sulphate was found to be the most common medication administered.

Conclusions
Case note review was limited by the documentation of the patient’s clinical status before and after naloxone administration. However, the multidisciplinary panel review allowed a more critical assessment of potential ADEs over review by pharmacists alone. This methodology has the potential to become the gold standard for confirming ADEs but is time consuming. Initial assessment by pharmacists followed by multidisciplinary confirmation might be a more sustainable approach.

References

Background
Transdermal opioid patches are widely prescribed for pain relief. The National Patient Safety Agency (NPSA) has reported deaths and severe harms associated with opioids. The Medication and Healthcare Regulatory Agency (MHRA) highlighted life-threatening adverse reactions and death from fentanyl overdose in people using opioid patches possibly due to poor patch visibility once applied.

An opioid patch monitoring chart was implemented in our hospital in March 2015 to reduce risks with administration of opioid patches. This was following an audit in 2014 which found that there was poor recording of the site of application of the opioid patches and daily opioid patch checks in the electronic prescribing system (EPMA).

Our aim was to audit compliance with an opioid patch monitoring chart implemented in March 2015.

Objective(s)
1. To assess standards for the documentation of opioid patch checks.
2. To assess completion of opioid patch check as per trusts standards for patients prescribed and administered patches

Main Standards:
- 100% of patients who have active prescriptions of opioid patches should have a opioid patch chart.
- 100% of opioid patch charts completed daily.

Method
A data collection form was developed, piloted and amended. The audit was completed for 35 wards across 3 sites (Sites 1 and 2 with EPMA and Site 3 with paper drug charts) over a 2 week period in December 2015. Accident and Emergency (A&E) and critical care wards were excluded as audit focused on Adults. Patients with active prescriptions for transdermal opioids were identified via EPMA for patients at Sites 1 and 2, and via paper charts on Site 3. The Controlled Drug (CD) Register was checked to identify patients with discontinued opioid patch prescriptions.

Results
During the audit period, no patients prescribed opioid patches were identified at Site 2. At Site 1, 35 patients were identified: 2 patients had discontinued patch prescriptions and 33 patients had active prescriptions. 94% (31/33) of patients had the opioid patch prompt acknowledged on EPMA of which 32.3% (10/31) had opioid patch monitoring charts. 90% (9/10) of the charts had the daily patch checks completed.

At Site 3, 34 patients had active prescriptions: 68% (23/34) had opioid patch monitoring charts; 26% (6/23) of the charts had the daily patch checks completed.

Conclusions
The opioid patch monitoring charts were poorly completed on Sites 1 and 3.

A lack of understanding as to what constitutes an opioid patch check may have contributed to the poor documentation. This audit is important as it measures the impact of a medication safety strategy to reduce risks of overdose due to duplicate patch administration.

Re-launch of the opioid patch monitoring chart and opioid safety teaching module by the Medication Safety Team has been set up to address the findings of this audit.

A re-audit will be completed 6 months after the nurse teaching sessions.
References

37. Application of quality improvement methodology to improve adherence to local hospital prescribing standards
F Cleat, J Main, Z McGroarty, E Milliken, R Robertson, L Summers, L Sutherland, A Coll, C Souter,
NHS Lothian Pharmacy Service, Edinburgh

Context
Pre-registration pharmacists implemented a series of changes to improve foundation year (FY) doctor prescribing in two acute hospitals within one NHS Board. This study did not require ethics approval.

Problem
Local audit1 across 40 wards with FY doctors identified suboptimal adherence to the local Golden Rules for Prescription Writing (Golden Rules) which support safe prescribing.

Assessment of problem
The Golden Rules with the lowest adherence and greatest risk to patient safety were: documenting allergy status (29%); recording antimicrobial indication and duration/review date (40%); and prescribing as required medicines with indication and frequency/maximum daily dose (18%).

The need to improve adherence was agreed with senior medical staff, clinical pharmacists, the antimicrobial management team (AMT), and a quality improvement facilitator.

Intervention
For each Golden Rule, changes were implemented within an appropriate clinical setting:
- Allergy status (Admissions unit) - education session to medical staff (all grades); medication administration prompt card inserted in patients’ bedside lockers; and an infographic displayed in staff clinical areas.
- Antimicrobials (General surgery) - semi-structured face to face interviews with FY doctors (n=5) and poster displayed next to the antimicrobial guideline on the wards.
- As required medicines (Orthopaedics) - education session and pocket dose reference card (FY doctors).

Process measures based on audit data and clinical settings were to achieve 50% adherence to the Golden Rule for allergy status, and 75% adherence to the Golden Rule for antimicrobial therapy and as required medicines.

Strategy for change
The clinical pharmacist for each area reviewed the interventions and facilitated participation in education sessions. The antimicrobial poster was modified following review by the AMT and FY doctors. Interventions were delivered over 8 weeks.

Measurement of improvement
Data was collected from a convenience sample of prescription and administration charts at baseline and weekly thereafter (Nov–Dec 2015). The sample included patients with allergy and no known drug allergy (n=10 for each); antimicrobial prescriptions (n=10); as required analgesic, antiemetic and laxative prescriptions (n=10 for each). Run charts were generated for each process measure.

Effects of changes
Adherence to the Golden Rule increased from 40% to 45% for allergy status, from 60% to 70% for antimicrobial prescriptions, and from 54% to 78% for as required medicines. Baseline adherence was higher than reported in the audit which may reflect the setting. The results suggest a positive impact supporting safer prescribing however there is still room for improvement, particularly around documenting allergy status. Limitations included FY doctors rotating mid study and accessibility of educational sessions due to shift patterns.

Conclusions
Implementing several changes within a short time frame did not allow sufficient data points to demonstrate sustained change. Involving the wider team (eg nurses) may have increased the impact of the changes. The interventions are being tested in downstream wards (medication administration prompt cards and as required pocket dose reference cards) and incorporated into local training programmes (antimicrobial poster and allergy infographic).

References

38. A quantitative comparison of ward-based clinical pharmacy activities in 7 acute UK hospitals
Raliat Onatade, King’s College Hospital NHS Foundation Trust, Gavin Miller, Lewisham and Greenwich NHS Trust, Inderjit Sanghera, London North West Healthcare NHS Trust

Background
The Royal Pharmaceutical Society Professional standards for Hospital Pharmacy Service2 provide the key principles for a clinical pharmacy service. Despite this, it is not clear whether clinical pharmacy services are provided in similar ways, what differences exist, and whether similar amounts of time are allocated to direct patient care between different hospitals and organisations.

Objectives
The objectives were to evaluate the similarities and differences in clinical pharmacy services between different UK hospitals and provide a basis for benchmarking.

Methods
This was a multi-centre prospective study, involving seven acute hospitals in three NHS Trusts in London. Standardised paper data collection forms with a pre-specified list of activities were generated by pharmacists. This involved several brainstorming sessions, followed by structured discussions to develop an initial list of activities. This list was subsequently validated by another group of clinical pharmacists. The final data collection form included definitions and explanatory notes. Following successful pilots, pharmacists in each hospital collected data for five consecutive weekdays in 2013, on the numbers and types of patients on the wards, activities undertaken, and amount of time spent during ward visits. The range and number of activities were compared. Chi-square tests were used to assess differences in the number of activities reported per 100 occupied bed days. Kruskal-Wallis H was used to test for differences across sites for time spent per patient.

Results
Pharmacists logged a total of 2,291 hours carrying out 40,000 activities. 13,022 inpatient encounters were recorded. For every 24 beds visited, a mean of 230 minutes was spent – seeing 6.2 new patients, carrying out 3.9 calculations and 1.3 patient consultations, checking and authorising 1.8 discharge prescriptions, and providing staff with information twice. 32% (range 17% - 38%) of discharge prescriptions had all medications available for supply direct from the ward. 54% (range 46% – 63%) of discharge prescriptions written by doctors needed correcting. Activity levels which varied significantly between hospitals included the number of care contributions (9 to 43 per 100 beds), pharmacists writing in notes (1 to 13 entries per 100 beds), medication endorsing (14 to 82 endorsements per 100 beds) and time spent per patient daily (6.7 to 13.4 minutes). Not all variations could be explained by differences in hospitals or Information Technology systems. However, the presence of electronic prescribing and medication administration and electronic patient records in one hospital had a significant impact on the clinical pharmacy activity profile, such as more entries in notes and fewer endorsements. The average ratio of patient consultations to patient encounters appeared low, at 6%.

Conclusions
This is the first detailed comparison of clinical pharmacy activities between different UK hospitals. There are some typical levels of activities carried out, allowing benchmarking. Wide variations in other activities could not always be explained. Despite a large number of patient contacts, pharmacists reported very few patient consultation sessions. Limitations include the non-inclusion of clinical pharmacy technician activity data and possible biases due to the self-reporting nature of the study.

References

39. The role of community pharmacists in delivering the 5-year antimicrobial resistance strategy

Background
Antimicrobial resistance is a worldwide public health crisis; this study analyses what approaches community pharmacies are currently undertaking in order to adhere to the antimicrobial resistance strategy set out by the Department of Health in 2013¹. By analysing these strategies and setting out an agenda for further strategies to be implemented, it is hoped that antimicrobial resistance will see a reduction in future generations.

Objectives
To determine the knowledge level and delivery of community pharmacists on the UK antimicrobial resistance strategy. To investigate pharmacist’s views on challenging GP’s about antibiotic prescribing as well as the use of diagnostic and point of care testing for early detection of infections.

Method
This study required and received ethics approval. A pilot questionnaire was designed in collaboration with an antimicrobial stewardship expert and after incorporating feedback from five non-participating community pharmacists it was sent out in January 2016 to participating community pharmacists across Calderdale and Kirklees, following consent from pharmacy managers and superintendents. In order to follow up community pharmacists; questionnaires that had been not been sent back were identified by a number to keep the anonymity of the research. Software, IBM SPSS statistics and Microsoft Office Excel, were used to interpret data.

Results
Fifty questionnaires were received. Only 28 pharmacists (56%) were aware of their local antibiotic guidelines and 38 pharmacists (76%) did not monitor local antibiotic prescribing from their GPs. Only 8 pharmacists (16%) completed CPPE learning in European Antibiotic Awareness week 2015 and 38 (76%) pharmacists did not encourage patients to sign up to become antibiotic guardians. Fifteen pharmacists (30%) never ask what an antibiotic is for and qualitative data from the study showed that pharmacists thought this question too sensitive to ask a patient but would be happy to discuss if this was written on a prescription for antibiotics. Only 23 (46%) pharmacists always check for allergies whereas 27 (54%) sometimes check. During patient counselling, 32 (64%) explained the dose, 31 (62%) explained about completing the course and 26 (52%) explained about the avoidance of sharing antibiotics with friends and family. Only 17 (34%) of pharmacists rate themselves as good antimicrobial stewards but when asked about further services, 37 (74%) pharmacists would consider point of care testing and 45 (90%) pharmacists would consider an expansion of a vaccination programme with 38 pharmacists stating that there needs to be more of an emphasis on hand washing.

Conclusion
This study suggests community pharmacists need more training in local antibiotic prescribing to deliver the 5-year antimicrobial strategy. Potential practice improvements could be made by the inclusion of the indication on an antibiotic prescription and a checklist including allergies of patients, counselling (dose, complete the course, left-overs and common side effects) as well as general hygiene and self-help guides for patients. The study also suggests that diagnostic services are something community pharmacists would develop which may show further implementation of the 5-year antimicrobial strategy.

Reference
40. Patient’s views of community pharmacists delivering the 5-year antimicrobial resistance strategy
Clifford E, Devine S, Mills J, Yazdani B, Hawksworth G. University of Huddersfield. Huddersfield
Howard P. Leeds Teaching Hospitals NHS Trust. Leeds

Introduction
Antimicrobial resistance is a worldwide public health crisis. This study analyses what approaches community pharmacies are currently undertaking to help deliver the antimicrobial resistance strategy set out by the Department of Health in 2013. In order to analyse how effective community pharmacists are at delivering the 5-year antimicrobial resistance strategy, patients collecting antibiotic prescriptions from 10 community pharmacies were asked about their use of antibiotics and the information they received from the pharmacist.

Objectives
To determine the views of patients collecting antibiotic prescriptions from community pharmacies about, having the indication for their antibiotic on their prescription, their views on antimicrobial resistance, the importance of adherence and the use of left over antibiotics and views on the NHS ‘treating your infection’ leaflets and their trust in healthcare professionals giving advice on antibiotics

Method
This study required and received ethical approval. A pilot questionnaire was developed in collaboration with an antimicrobial stewardship expert and was completed by 5 non-participating patients for feedback to inform the final patient’s questionnaire. Consent forms were obtained from 10 participating local pharmacies to allow data to be collected from patients visiting their pharmacy over a 4-week period in January 2016. Participant information leaflets and NHS ‘treating your infection’ leaflets were given to patients with the questionnaire. IBM SPSS statistics and Microsoft Office Excel, were used to interpret data.

Results
121 questionnaires were completed. 83 patients (69%) would see their community pharmacist before their GP if they had a cold or flu. Ninety patients (74%) said they stopped their antibiotics before completing the course, 20/90 (30%) stopped as they felt better, 1/90 (0.9%) due to alcohol consumption, 18/90 (20%) couldn’t remember and 6/90 (7%) said it was side effects with 48 patients (40%) flushing leftovers down the toilet. Only 41 patients (34%) were asked about their allergy status by their community pharmacist. However 104 patients (86%) said they were happy for a community pharmacist to access their records. One hundred (83%) of patients would be comfortable having their indication written on their prescription but when asked about personal conditions (HIV, chlamydia, etc.), 18 (18%) changed their mind. Ninety-one patients (75%) said they knew what antimicrobial resistance was, but confirmed their knowledge was obtained via the media although 81 patients (67%) said that they didn’t trust the media. Patients were aware of the NHS self help guide with 92 patients (76%) in favour, however if a GP refused antibiotics, 101 (84%) patients said they would not try another GP.

Conclusion
This study highlights the potential of development of practice around specific counselling points on antibiotics from community pharmacists to improve adherence to the 5-year antimicrobial strategy plan so patients obtain relevant information and resources from trusted sources such as the community pharmacist or GP. Further interventions such as the indication on antibiotic prescriptions at the patient’s discretion would help improve antibiotic monitoring and counselling.

Reference

41. Evaluating the Use of Carbapenem and Piperacillin/Tazobactam within NHS Scotland
Cockburn, AJ1, Sneddon J1, Bennie M2, Mohana A2, Health Protection Scotland1 Strathclyde University2

Background
In 2013 the Scottish Antimicrobial Prescribing Group (SAPG) produced guidance to promote better use of carbapenems and piperacillin/tazobactam (piptaz) as a measure to reduce emergence of Multi-Drug Resistant Gram Negative Bacteria (MDRGNB). The effectiveness of implementation of this national guidance and its impact on the utilisation of these agents in local clinical practice was unknown.

Material/methods
A multi-professional study steering group was established and an online survey was developed to assess local uptake and implementation of the SAPG guidance and determine how carbapenems and piptaz were used in practice. A link to the survey was sent via email to Antimicrobial Management Teams (AMTs) in all health boards. Results were analysed at national and regional level. A bespoke point prevalence survey was carried out in acute hospitals to determine the prevalence and patterns of use for carbapenems and piptaz using the National Antimicrobial Stewardship Point Prevalence System® (NAS-PPS). Results were analysed at national and regional level to evaluate compliance with local guidance.

Results
Survey results - All 15 health boards responded to the survey. Local guidelines were either updated or reviewed based on SAPG guidance in 93% of boards. Clinicians were informed about the guidance verbally or electronically in 60% of boards and 80% of boards integrated it into routine training on antimicrobials. Meropenem is subject to prescribing restrictions in 87% of boards and the most common indication for its use is second line for febrile neutropenia. All boards routinely test meropenem sensitivity but 87% suppress results when reporting to clinicians. Imipenem is used in 20% of boards. Ertapenem is used in 80% of boards, predominantly for Out-patient Antimicrobial Therapy (OPAT). Piperacillin/Tazobactam is subject to prescribing restrictions in 46% of boards with neutropenic sepsis and febrile neutropenia the most common indications. Sensitivity testing is performed in all boards but results are suppressed in 80%. Carbapenem-sparing antimicrobials are used to varying extents.

Point prevalence results - A bespoke PPS was carried out in October 2015 using a dataset similar to previous European surveys. Results showed a marked variation in prevalence of carbapenem and piptaz use between boards and good compliance with local guidelines for meropenem. Compliance with guidance for piperacillin/tazobactam was more variable, in part due to less restrictions on its use. Individual board reports on both the survey and PPS data have allowed comparison between local guidelines recommendations and actual prescribing practice to identify areas for improvement.

Conclusions
The majority of boards have implemented the SAPG guidance as part of their local antimicrobial stewardship programme. Compliance with local guidelines varies and target areas for local quality improvement have been identified. Further qualitative work will evaluate clinician attitudes to use of carbapenems and piperacillin/tazobactam to inform behavioural change strategies.

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Background
It is estimated by 2040, nearly one in four people in the UK will be aged 65 or over. In the UK, 45% of prescriptions are dispensed to patients over the age of 65. Demonstrating empathy towards patients can assist in optimising clinical outcomes, as well as providing better higher levels of patient satisfaction. The Geriatric Medication Game® (mGMG) was developed to highlight the challenges experienced by elderly patients when managing their medication and was adapted by the research group to reflect practice in the UK including patient experiences in the NHS.

Objectives
Pre and post participation in the mGMG;
1. Determine the empathy of the first year MPharm cohort using the adapted Jefferson Empathy Scale
2. Compare the attitudes of first year students towards the aging population pre and post mGMG.

Methods
An adapted Jefferson Scale of Empathy—Healthcare Profession Students (JSE-HPS) was used to measure the baseline empathy of the entire first year MPharm cohort. A representative (sex, GB, international) sample of 16 students were selected from volunteers and allocated to pre or post mGMG focus groups. JSE-HPS was repeated post participation. The transcripts were analysed via thematic analysis. This study required and received ethical approval.

Results
The first year cohort (n=98) had a mean empathy score from JSE-HPS of 79.91/100 with post-mGMG participants (n=16) scoring 81.25. Four key themes were identified from the focus groups;
1. Understanding the patient’s perspective
2. Access to healthcare
3. Discrimination

Conclusions
The first year pharmacy students as a cohort (n=98) achieved a mean empathy score of 79.91/100, compared to the post-mGMG participants (n=16) who achieved a mean empathy score of 81.25, a definite improvement in empathy post mGMG. Both of these scores indicate a higher level of empathy than expected for first year students although there is no optimum score for empathy for healthcare students. Most students entered the game with pre-existing, self-determined, high levels of empathy and participation reinforced these already high levels. Empathy has been shown to decline over time with healthcare students and the School hope to repeat this workshop later in the MPharm to determine any deviations in student empathy. Students interviewed also believed that incorporation of this game into future training programmes within the MPharm or during the pre-registration year would be extremely useful.

References
Results
Part one - 188 complete responses were received across the three surveys. All statements achieved a modal score of 4. 23/43 statements were reviewed, of which 19 required revision. One statement was separated into two.
Part two - 5/48 statements achieved an I-CVI of less than 0.8 (range 0.4 to 1) for either clarity or simplicity, or both. 91% of statements had a modal score of 4. The average CVI for the whole tool was 0.91 for clarity and 0.96 for simplicity. During the panel discussion, all five statements were revised and achieved consensus.

Conclusions
A robust, recognised process has been undertaken to ensure good content validity. Further studies planned are construct validity, comprehensiveness and inter- and intra-rater reliability. These will support use of the tool in both research and practice.
A limitation may be that the tool is only being validated for use in hospitals at this time. Repeat studies would be needed if the tool were to be used in other settings.

References

44. Pharmacy technician transcription of discharge prescriptions in the Royal Alexandra Hospital: Pilot study
O’Prey A, Green S, Munro K, Royal Alexandra Hospital, Paisley, NHS Greater Glasgow and Clyde

Background
Delayed patient discharge from acute hospitals affects bed availability for new admissions. Previous health improvement work regarding patient flow at the RAH identified that production of the electronic discharge prescription or immediate discharge letter (IDL) using the TrakCare® system was a contributory factor. Traditionally it is the responsibility of the junior doctors (FY1, FY2) to generate the IDL. However, this is often afforded a lower priority than other tasks and junior doctors have been shown to be more likely to contribute to errors when prescribing or transcribing than other healthcare professionals 1. These errors can lead to further delays in the discharge process. In order to address inefficiencies in the discharge process, a pilot of medicine transcription to the IDL by a pharmacy technician was proposed.

Aim
To establish whether medicine transcription by pharmacy technicians would affect the time of patient discharge from secondary care and the number of transcription errors on the IDL.

Method
An initial pilot was conducted prior to data collection on all medical wards over a 12 week period between March and June 2015. Exclusions included prescriptions written out of hours and wards outwith the medical tower. The data was divided into two groups, IDLs generated by junior doctors and by pharmacy technicians (which were countersigned by the doctors). The outcome indicators were, number of transcription errors rectified by the pharmacist, time interval for prescription completion (take home medicines ready) and patient discharge. Data was analysed using Minitab® and descriptive statistics, T-tests and Mann-Whitney tests were used. This study did not require ethics approval.

Results
1002 IDLs were reviewed and 890 (89%) were suitable for inclusion for analysis. The number of prescriptions containing transcribing errors was significantly lower in the pharmacy technician group (24 (n=392) vs 143 (n=498) p = 0.001). The maximum number of errors per prescriptions for junior doctors was 12 compared with 1 for technicians. The majority of transcription errors were classified as having potential to cause low to moderate harm to patients. The average time taken for prescription completion was 3.2 hours shorter for technician transcribed prescriptions. The average time for discharge from hospital was 13.3 hours shorter for technician transcribed prescriptions.

Conclusion
The pilot demonstrated that IDLs generated by pharmacy technicians were significantly more accurate than those by junior doctors. It has been recognised that the time taken to rectify errors can contribute to delays in preparation of discharge medicines. Improved accuracy of the prescriptions transcribed by the technician may also help to improve patient safety.

Although it was acknowledged that the technician might be directed towards more urgent discharges, the shorter completion time for IDLs was consistent across different sub-groups of same day and next day discharges. The addition of a transcribing technician helped reduce the time taken for patient discharge.

References

45. Timeliness, accuracy and reconciliation of hospital discharge letters received by primary care
1Parmar J, 1Charlton A, 2Campbell J, 2Hall R, 1University Hospitals NHS Foundation Trust, 2Old School Surgery and Pharmacy, Bristol

Background
The National Institute for Health and Care Excellence (NICE) recommend that medicines reconciliation (MR) upon hospital discharge should occur within 1 week of the GP practice receiving the information and before further prescriptions are issued [1]. However, 84% of GPs “occasionally” or “never” receive information about why medicines have been altered in hospital [2] and subsequently 43% of patients have discrepancies between the medication prescribed on discharge and those subsequently prescribed [3]. NICE also recommend that MR in primary care should be undertaken by a healthcare professional, however the Care Quality Commission found that clerical staff undertake this in 17% of Practices [1,4]. This study aims to assess the timeliness of receipt and accuracy of information provided to Old School Surgery (OSS) upon hospital discharge and the subsequent MR at OSS.
Standards
100% of discharge letters will be received by OSS within 5 working days
100% of discharge letters received will be reconciled within 5 working days and before further prescriptions are issued
100% of MR at OSS will be undertaken by a healthcare professional
100% of medicines stopped/started during admission will have a reason stated
100% of medicines on the GP record will be accounted for on discharge (i.e. continued, changed or stopped)

Method
This study did not require ethics approval. All patients at OSS who were discharged from hospital between 30/09/15-02/12/15 were included in the audit. Data was collected from discharge letters and patients’ GP records to identify medication prescribed prior to admission and post-discharge from hospital.

Results
From a total of 54 discharge letters, 85% were received within 5 working days. 83% were reconciled within 5 working days and before further prescriptions were issued all of which was completed by the practice pharmacist. 23 patients had medication stopped during admission but only 61% had a reason stated. 45 patients had new medication but only 58% had an indication. From 51 patients who were on medication prior to admission only 69% had all their medication accounted for on discharge.

Conclusions
Although this was a small study, the results indicate there can be a considerable delay in the transfer of information upon discharge. 17% of discharges were not reconciled within 5 working days, failing to meet NICE targets although all were completed by a healthcare professional due to the employment of a practice pharmacist. This audit demonstrates that inadequate information regarding medication changes in hospital is being relayed to primary care. Improving communication following discharge could lead to more informed prescribing decisions in primary care thus improving patient care.

References
1. NICE. Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes; London, March 2015
2. Royal Pharmaceutical Society of Great Britain (RPSGB). Moving patients, Moving Medicines, Moving Safely; Guidance on discharge and transfer planning; London, 2005

46. Integrated pre-registration pharmacist placement: Reflections from acute, general practitioner (GP) and community tutors
Bewick, T*, Campbell, J, Hall, R, Ireland, H and Parmar, J. *South West Medicines Information and Training, Bristol, ^Old School Pharmacy, Bristol, *The Old School Surgery, Bristol and *University Hospitals Bristol, Bristol

Background
Traditionally most pre-registration training places have been either acute hospital or community pharmacy based. Challenges to how healthcare boundaries are viewed, the growth in clinical pharmacy in primary care(1) and reshaping the healthcare workforce(2) are encouraging the re-design of pre-registration pharmacist training programmes. This led to the development of an integrated training scheme involving practice based experiences in an acute, GP and community pharmacy setting. The single, cohesive programme required the trainee to develop skills at each pharmacy practice setting and revisit each area several times over the training year. Tasks and responsibilities were increased with each rotation under the direction and feedback of a pharmacist tutor in each setting.

Objective(s)
All three tutors were encouraged to reflect on their tutoring experience from the integrated placement to discover if the programme was felt to bring benefit and to identify areas for improvement.

Method
This study did not require ethics approval. At week 43 of training year, tutors reflected on the challenges, rewards and suggestions to improve the integrated programme from their experience. Tutors submitted their reflections via email. A member of the regional training team reviewed all submissions and used a thematic interpretative analysis approach to identify and evaluate patterns and meaning across the responses.

Results
The tutors reported challenges and raised the importance of timetabling tutor meetings before each 13 week appraisal. Tutors identified that if the trainee had not progressed on the trajectory expected, it may have been more difficult to respond quickly to the trainees needs if tutor meetings had not been prearranged “But if there were problems, it would have been difficult to pick this up/communicate between us if we hadn’t arranged regular catch ups” Tutor A. Tutors also reported the training programme must be flexible meet the trainees individual learning needs “There was a training plan… subsequently we had to change some of her community weeks to hospital” Tutor A. The tutors reported an integrated programme provides vast opportunities for the trainee to develop transferrable skills “They have the skills to work in all three sectors which makes them much more employable in the future” Tutor B. Tutors reported that the scheme also provided development benefits for tutors as the trainee shared learning and experiences from other sectors in the placement “I have learnt from the trainee” Tutor B.

Conclusions
The study discovered the importance of structured and regular communication between tutors across different sites to monitor the trainees’ progression, to enable rotations to build on previous achievements and identify any concerns promptly. The training programme must also be flexible to complement the trainees need.

The study found that an integrated scheme was felt to develop the skill set of the trainee and also tutor within each placement area.

References
47. Achievement of the 2015/16 CQUIN goal for AKI at University Hospital Southampton
Rhian Pearce, James Allen, Jasmine Sagoo, University Hospital Southampton, Southampton

Context
Acute kidney injury (AKI) is associated with significant morbidity and mortality in patients with acute illness. The 2009 NCEPOD report, ‘Acute Kidney Injury: Adding insult to injury’ highlighted widespread deficiencies in care of patients with AKI. These findings prompted the introduction of a 2015/2016 Commissioning for Quality and innovation (CQUIN) goal, mandating a range of improvements in documentation and clinical review of patients with AKI.

Problem
Compliance with the CQUIN depended on key pieces of information being recorded on the eDischarge Summary (eDS) in patients who sustained an AKI during their admission. Baseline data indicated that University Hospital Southampton did not meet the required CQUIN standard, with less than 15% of patients compliant. Ethics approval was not required.

Intervention
A feasibility study demonstrated that clinical pharmacists are well positioned to ensure CQUIN information is provided on discharge summaries, with an additional 43 hrs per week of pharmacy time required to fulfil the CQUIN demands. Funding was secured to employ a whole time equivalent band 7 pharmacist.

We collaborated with the IT team to develop an IT infrastructure to support CQUIN delivery. Key outputs included:

1. Development of an AKI web page

Pharmacists are providing the necessary level of documentation at discharge, largely through completion of an electronic tab that automatically appears in the eDS. Pharmacy engagement in the development phase ensured the tab was compatible with pharmacy processes and designed to maximise compliance with the CQUIN.

II. Implementation of a reporting tool.

We developed a reporting tool that allows targeted, real time identification of AKI records that fail to comply with the CQUIN. A dedicated pharmacist is responsible for reviewing the report and correcting non-compliance. This is also important in monitoring the quality of information provided.

III. Emailed reports of AKI alerts

Pharmacists receive daily reports of patients who have triggered an AKI alert. This has resulted in improved patient prioritisation. It is also expected that early intervention and enhanced detection of AKI will lead to improved patient outcomes.

Measurement for improvement
CQUIN compliance: Provision of information on the eDS was audited monthly, following the methodology outlined by the CQUIN audit tool. All quarterly targets were met across the 12 month audit period, achieving 90% compliance in the final quarter.

Pharmacy contribution
Clinical pharmacy input was determined using repeat point prevalence data and indicated that in excess of 90% of AKI tabs were completed and/or reviewed by pharmacists. Analysis of the reporting tool output indicated that information provided by other healthcare professional less frequently complied with the CQUIN specific criteria, providing further justification for continued investment in pharmacy resource.

Effects of change
University Hospital Southampton NHS Foundation Trust has successfully achieved the highest level of compliance with the AKI CQUIN goal, avoiding a financial loss of £955,000

Conclusion
The CQUIN achievement for 2015/16 can largely be attributed to clinical pharmacy engagement, enabled through dedicated pharmacy resource and IT development work.

References

48. An audit of non-administration codes used at The Royal Liverpool University Hospital
Sophie Pickles, Karen Adams, The Royal Liverpool and Broadgreen University Hospitals NHS Trust, Liverpool

Background
An NPSA alert in 2010 emphasised the importance of reducing the risk of harm to patients by reducing omitted or delayed doses of critical medication. It is imperative that processes are in place to reduce this risk to patients. The evolution of the Electronic Prescribing and Medicines Administration system (EPMA) has enabled the RLHU to generate a report of all critical medicine omissions over a 48-hour period within the Trust. The successful implementation of this report at ward level is reliant on the validation of non-administration codes used by nurses when charting a dose omission on EPMA.

Objectives
Audit Standards:
1. 100% of non-administration codes were correctly selected on EPMA.
2. 100% of omissions were appropriately managed according to the UKMi omitted medicines implementation tool.

Method
This study did not require ethics approval. The codes used for critical medicine dose omissions from the report were investigated using EPMA and ward-based resources including case notes and verbal communication with ward staff. Following this, each omitted dose was analysed against the UKMi omitted medicines implementation tool and assigned a risk score.

Results
A total of 437 codes were audited involving 182 patients. 231 (52.8%) codes were deemed to be inappropriate following investigation. There were 12 codes available for use. Of these, ‘Unable to Confirm Administration’ accounted for 106 (24.3%) of the total codes audited and was the most inappropriately used code (100.0%). ‘Admin Inappropriate – See Note’ was used inaccurately in 60.0% of cases and accounted for 175 (40.0%) of the
codes audited. 72 (41.1%) of these codes did not have a note attached to communicate why the administration may have been inappropriate to other healthcare professionals. 341 (78.0%) codes carried the highest UKMi risk score of 3.

Conclusions

It was concerning to find that over half of the non-administration codes used for critical medicines were assigned inappropriately. ‘Unable to Confirm Administration’ was the most inappropriately used code. The audit has highlighted a tendency by nursing staff to use this code for previous dose administrations which were not assigned a code in order to resolve the non-recording of information. It is important to note that due to this tendency, the use of this code may not truly represent a dose omission in all cases. The use of the code ‘Unable to Confirm Administration’ should be reviewed and a training package on the correct use of non-administration codes should be incorporated into EPMA training for nurses. Furthermore, a pilot of a self-check at the end of a medication administration round could be undertaken by nurses to endeavour to reduce the risk of non-administration of critical medicines.

References


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**49. An educational intervention to improve medication incident reporting among junior hospital pharmacists**

**Porter, M.1 Kinnear, M.1,2 Souter, C.1,2, NHS Lothian Pharmacy Service, Edinburgh1 and University of Strathclyde, Glasgow2**

**Background**

Under-reporting of medication incidents is a recognised issue. Pharmacists have a professional responsibility to report medication errors but uncertainty about what and when to report is a barrier. Limited incident reports suggested a training need for junior hospital pharmacists across a health board.

**Objective**

Design and evaluate the impact of an educational intervention on the number of medication incident reports made by junior pharmacists.

**Method**

This study did not require ethics approval.

Problem based scenarios (n=30) were developed using prescribing error incidents reported on the online Datix® reporting system, discussion with pharmacy managers and the Quality Assurance pharmacist. Face-to-face meetings with 8 senior clinical pharmacists set the gold standard for each scenario in terms of consensus for ‘definitely report’, ‘report if I had time’ or ‘would not report’. Failure to gain consensus resulted in scenario exclusion. Four scenarios were selected for the educational intervention. The intervention was piloted and delivered to band 6/7 clinical pharmacists at 2 hospitals (Nov/Dec’13). Participants evaluated the training session. Participants completed an online questionnaire for 18 scenarios using the 3 categories of reporting pre-, post- and 6 months after the intervention. Responses were compared to the gold standard and the number of same responses expressed as a percentage score. Incident reports made by band 6/7 pharmacists were retrieved for the 6 month period before and after the intervention.

**Results**

Of the 40 eligible pharmacists, 20 were available to participate in the intervention and assessment. Four were lost to follow up and excluded from analysis. The mean difference in scores pre and post intervention was 12.2% p=0.065 and between pre and 6 months post was 9.9% p=0.1249 (t-test). The mean score increased from 44.8% to 56.9% post intervention and was 54.7% at 6 months. The number of incident reports increased from 12 pre-intervention to 18 post-intervention. For those who participated, reports increased from 3/12 (25.0%) to 15/18 (83.3%) p=0.002. (Fisher’s exact test) Following the intervention, pharmacists reported an intention to change practice, “I feel more willing to complete Datix® reports” and “The session has made me consider the value of Datix® reporting”. All participants agreed that the session was relevant to their practice and would recommend that new pharmacists receive the training.

**Conclusions**

There was a trend of improvement in the assessment score. The improvement in score was less than that anticipated (20%) and therefore a larger sample size is needed for significance. Time constraints, staff shortages and absences limited the number of participants. Results could have been strengthened by running more sessions over a longer time period if the project timeframe had allowed. Reporting behaviour changed and it is intended to roll out the intervention with further impact assessment. The intervention targeted one barrier to error reporting, further work is required.

**References**


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**50. Outcomes from providing a clinical pharmacy service to patients closer to home**

**Lynne Precious, Hameda Lane, Mid Yorkshire Hospitals NHS Trust, Wakefield**

**Context**

Connecting Care Teams (CCTs) were introduced as a joint venture between multiple organisations within the Wakefield District Area. This multidisciplinary team provides holistic treatment to adults over 18 years, having a rising risk of admission or readmission to hospital.

**Problem**

The organisations worked collaboratively identifying a lack of integrated care across organisations potentially contributed to unnecessary hospital admission, delayed intervention and discharges. Poor medicines adherence can lead to poor outcomes and adverse drug reactions (ADRs) can result in unnecessary hospital admissions.

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Intervention
The CCT hospital pharmacists visited patients in their own homes to review drug therapy, ADRs, provide medicines advice and assess adherence, in accordance with medicines optimisation principles. This study did not require ethics approval.

Strategy for change
Services were promoted to GP practices and forums, clinical staff in the acute Trust, voluntary organisations and patients between February 2014 and March 2015.

Measurement for improvement
Interventions were recorded on the patient record for 410 patients referred to the CCT pharmacists between April 2015 and March 2016. Data was extracted from the system showing 191 amendments were made to medication regimes, 23 ADRs reviewed and medicines education and advice provided on 370 occasions. Medicines reconciliation was carried out on all patients. Assessments for compliance aids and adherence to medicines was measured wherever possible. Excess or discontinued medicines removed from the patient’s property was also recorded.

Effects of changes
The greatest impact was seen in medication adherence, showing an improvement in 78 out of the 82 cases, with 57 achieving 100% adherence. Prescribers were generally receptive to recommended changes in medication regimes. Positive feedback from service users was received and patients were able to access services and interventions sooner. The ADRs reviewed could have impacted on adherence, treatment outcomes and potentially hospital admissions and shared learning from medication incidents was provided across the organisations.

There were challenges with engaging GP practices and many GPs were uncertain about the role of the clinical pharmacist. These were overcome through further engagement work by a co-ordinated team effort, feedback of outcomes from specific cases and improved understanding as the service developed.

Conclusions
The service demonstrated a number of benefits through the integrated multidisciplinary team approach, particularly with some of the challenges. The domiciliary visits offered patients improved access to expert medicines advice in their usual environment which enabled better evaluation of adherence and a reduction in medicines waste.

The outcomes demonstrated sufficient benefit to support continued funding for the CCT pharmacists and led to a demand in reviewing care home patients to support the Care Homes Vanguard.

References

51. Doctor and nurse perception of priority and quality of ward pharmacy services
Rahman M; Sharma R; Nottingham University Hospitals NHS Trust

Background
Although there is some published stakeholder priority and quality perception of clinical pharmacy services, there is little published information about this in UK. Locally, Pharmacy receive anecdotal feedback from healthcare professionals but this has never been collated formally.

Objective(s)
1) To determine nurse and doctor opinion about the priority of ward based clinical pharmacy functions.
2) To determine nurse and doctor perception of the standard of ward based clinical pharmacy functions.

Method
A pre-piloted questionnaire was circulated to nurses and doctors of 12 surgical wards at one campus of a large two-site acute teaching hospital. They were asked to rank importance of each of nine functions (medication supply, drug history taking, assessing patients’ own medicines, medication reconciliation, daily clinical review, screening discharge prescriptions, timely dispensing of discharge medicines, counselling patients, and clinical advice to healthcare professionals) from 1 (most important) to 9 (least important) and rate how well pharmacy delivered these (1 – appalling; 2 – below standard; 3 – satisfactory; 4 – above standard; 5 – exceptional).

The study did not require ethics approval. A limitation of the study was that only a selection of wards were used on one of two sites.

Results
38 questionnaires were returned (17 doctors, 21 nurses). 17 (45%) respondents rated ‘medication supply’ as their top rank. Pooling the ‘top 3’ ranked functions, ‘medication supply’ featured in 21 (55%) responses, followed by ‘drug history taking’ (20, 53%) and ‘clinical advice’ (15, 39%). Only 3 (8%) respondents rated ‘assessing patients own medicines’ in their ‘top 3’; ‘counselling patients’ only featured in 7 (18%) cases. These latter two functions were also rated ‘lowest rank’ by 15 (39%) respondents.

For 6 out of 9 functions, 100% rated the function being delivered ‘satisfactorily’ or above, with 70-80% rating them ‘above standard’ or ‘exceptional’.

Over 80% of respondents rated the ‘top 3’ most important functions being delivered ‘above standard’ or ‘exceptionally’.

One respondent rated ‘assessing patients’ own medicines’ as ‘below standard’; whilst 4 (11%) respondents each scored ‘below standard’ for ‘timely dispensing of discharge medication’ and ‘counselling patients’.

Conclusions
Perhaps unsurprisingly, ‘medicines supply’ is considered a core function by the majority. A more proactive demonstration of value of other important functions is required, possibly by sharing the pharmacy contributions/interventions made on wards.

It is reassuring that all respondents reported the ‘most important’ (top 3) ranked services as being delivered satisfactorily or above, with the majority rating them as ‘above standard’ or ‘exceptional’.

A small number of respondents rated ‘timely dispensing of discharge prescriptions’ as ‘below standard’. This is being followed up by a multidisciplinary group looking at the whole discharge pathway.

A small proportion of respondents also rated ‘counselling’ as ‘below’ standard – which interestingly also featured in the ‘least’ important ranked functions. Perhaps this question is best directed to patients themselves.
References

52. A study into final-year pharmacy students' perceived preparedness for pre-registration pharmacist training
Vilis Savickas1,2, Alice Conway1,2, 1Pharmacy Department (Brighton and Sussex University Hospitals' NHS Trust), Brighton, 2School of Pharmacy and Biomolecular Sciences (University of Brighton), Brighton

Background
A common route to registering as a pharmacist in Great Britain is a four-year Master of Pharmacy (MPharm) degree followed by 52-week-long pre-registration training (PT),1,2 however graduates may not be sufficiently prepared for the latter.3,5

Objectives
This study aims to explore the perceived preparedness to undertake PT considering the academic knowledge, professionalism and clinical skills of final-year students in the last cohort of the old MPharm degree at the University of Brighton (UoB).

Method
This study required and received the ethics approval from UoB Centre for Learning and Teaching. Fifteen out of 146 final-year students responded to initial email invitations to participate and completed pre-interview demographic questionnaires. At the time of interviews, the majority of participants had secured a PT place in community (9/15) or hospital (4/15) pharmacy with as many as 13/15 previously undertaking self-arranged pharmacy placements. Four 1-hour-long focus groups with 3-4 students were facilitated by teacher practitioner at the acute NHS Trust. Audio files were transcribed, coded and analysed using the framework approach6 identifying key themes and recommendations.

Results
Overall, students were satisfied with their knowledge of "science behind medications", but would struggle to “put it into context” due to the lack of "clinical teaching." They were confident about professionalism, yet were "worried about actually making a decision that could impact somebody" or interacting with others requesting more community pharmacy-related experience. Those with prior experience thought that students “who don’t have part time jobs, don’t have experience to operate in community pharmacy.” Students felt that special clinical topic modules should be made compulsory whereas the final-year project created a “massive gap” prior to PT. The area of practice chosen for PT did not influence participants' responses.

Conclusions
The findings of this study compare to existing literature where the lack of “hands-on” experience is emphasised as the key flaw of undergraduate pharmacy courses.4,5 Whilst some themes identified have been addressed in the new MPharm degree, they urge the course development team to review the contents of 3rd and 4th years to ensure that students feel better prepared to step into PT. Our recommendations may guide larger-scale investigations with students from the new UoB MPharm degree.

References

53. Minimising patient harm from orthopaedic antimicrobial prophylaxis at a District General Hospital (DGH)
Omair Shabir, Frances Kerr, Julie Kerr, Steve McCormick, NHS Lanarkshire, Airdrie

Background
In 2010 local surgical prophylaxis orthopaedic policy was revised to minimise clostridium difficile infection (CDI) risk1, changing from cefuroxime to flucloxacillin +/- gentamicin (3mg/kg). In 2013 harm from acute kidney injury (AKI) was linked to this regimen in orthopaedic patients nationally and gentamicin dose was reduced locally (1-2mg/kg). Recent adaptation in September 2015 permitted cefuroxime OR flucloxacillin +/- synergistic gentamicin (dose reduced further if AKI risk).

Objectives
To audit local orthopaedic surgical prophylaxis prescribing practice against policy and Scottish Intercollegiate Guidelines Network (SIGN) 104 standards2, assessing patient risk factors and post-operative incidence of AKI
To assess CDI and Surgical Site Infection (SSI) rates post policy update

Standards:
100% of antibiotic prophylaxis are prescribed on drug cardex, administered within ≤60 minutes pre-skin incision, comply with local policy and be single dose or ≤24 hours
100% of patients with AKI risk prescribed gentamicin are dose adjusted

Method
SSI Surveillance nurses identified consecutive orthopaedic patients during Dec’2015-Feb’2016 and provided comparative data on hospital SSI and CDI rates over the same period. Case notes were audited retrospectively. AKI risk factors (age; nephrotoxic agents; kidney disease; co-morbidity) were audited against local policy guidance. AKI was assessed using the RIFLE scoring tool8. This study did not require ethics approval.
Results
32 patients were identified and audited. 97% received recommended antibiotics. 47% received cefuroxime and 44% received flucloxacillin + gentamicin. 78% received recommended dose. 84% of antibiotics were prescribed on cardex. 100% were administered ≤60 minutes pre-skin incision and 91% of prophylaxis was given for <24 hours.
All patients receiving gentamicin had ≥1 AKI risk factors, 20% were dose adjusted. 20% receiving gentamicin + flucloxacillin experienced transient 1.5-2x increases in serum creatinine (RIFLE category 1). SSI and CDI rates were comparable pre and post policy revision. Although 1 patient was highlighted as developing CDI post cefuroxime, 12 week follow up was not completed for all patients but captured in ongoing SSI/CDI surveillance.

Conclusions
Compliance with prescribing standards was high. Correct dosing identified as area for improvement. Dose reduction for patients administered gentamicin with AKI risk factors is not done routinely despite 20% scoring as RIFLE category 1. Discussion is underway to establish reasons for this and why 22% of antibiotic doses out with guidance. No increased overall rates of SSI or CDI were observed following cefuroxime policy inclusion, prospective monitoring for both should continue. Audit limitations include lack of documentation of AKI risk factors and post operative bloods not being routinely taken. Follow up of patients audited to assess for CDI and SSI was not undertaken as part of study.

References

54. Evaluation of a pharmacist review of patients with Clostridium difficile infection
Danielle Stacey, Dudley Group NHS Foundation Trust, Dudley

This study did not require ethics approval.

Context
Since 2007, acute trusts have significantly reduced the number of hospital acquired Clostridium difficile infection (CDI) cases. In 2013, Dudley Group seconded a specialist pharmacist to support the Infection Prevention and Control (IPC) team to develop new approaches to preventing and managing CDI.

Problem
CDI carries a high mortality risk. Alongside CDI prevention strategies, this service aimed to improve outcomes for patients who develop CDI, working closely with IPC, Microbiology and Trust Management.

Strategy for Change
Cases of CDI for a three month period (intervention period) were identified using the Trust IPC database (n=56). Comparison cases were also identified for the same period in a previous year (n=95). 21 other patients who were considered at high risk of developing CDI e.g. concurrent antibiotics, aged over 75 living in residential/nursing care were also reviewed.

Intervention
The pharmacist reviewed patients with a laboratory positive diagnosis of CDI within three days of diagnosis and as often as necessary after this. Interventions were made by discussing with medical teams and were documented in medical notes. Characteristics of patient groups were similar; mean age at pre-intervention was 73.6 years and 72.2 years in the intervention group. Average Charlston comorbidity index was 4.5 and 4.8, respectively.

Measurement of improvement
Time to resolution (TTR) of diarrhoea was the primary measure for improvement. Secondary measures were 30 day mortality and length of stay (LOS). Adherence to antimicrobial and proton-pump inhibitor (PPI) guidelines were also collected.

Effects of Change
• 42/56 (75%) patients were reviewed by pharmacist.
• 83% (35/42) required some intervention.
• TTR of diarrhoea was 1.4 days shorter in the intervention group (5.9 vs 4.5 days, p=0.13)
• LOS was 27.9 days in the pre-intervention group and 35 days in the intervention group. Both groups had discharges delayed for reasons other than CDI
• For patients with recurrent CDI, TTR of diarrhoea was reduced by 6.6 days (p<0.05) and LOS decreased by 8.4 days through prompt and correct management
• 30 day mortality reduced from 20% to 7%, although the significance of this is unclear
• Appropriate antimicrobial therapy within 72 hours increased from 88% to 100%.
• PPI review documentation increased from 58% to 100%.
• In total 69 interventions were made in 63 patients including: advising CDI treatment (30%), switching antibiotics (25%), stopping laxatives and PPIs (23%) and in three cases, identifying CDI relapse/recurrence.

Conclusion
Appropriate antibiotic prescribing and PPI review demonstrate the quality benefits to patients, as well as the improvement in TTR of diarrhoea. There are benefits for the Trust; patients can be moved out of isolation sooner – saving approximately 120 side room days/year allowing more prompt isolation for other patients with infectious diseases. Further benefits were seen in patients with recurrent CDI, as well as statistically significant reduction in TTR of symptoms, earlier discharge was expedited. This estimated to save £6 bed days over 3 months at approximately £15,000. Overall, the evaluation supports pharmacist management of CDI and led to permanent recruitment of the post.
55. An audit of apixaban prescribing for atrial fibrillation in a hospital setting
Jacqueline Starrs1, Ian Towle1, Pernille Sorensen1, Jennifer Pirrie2
1University of Strathclyde, Glasgow, 2NHS Greater Glasgow & Clyde, Glasgow

Background
The oral anticoagulant apixaban is becoming a popular first-line option for prevention of stroke and systemic embolism, in adults with non-valvular atrial fibrillation (NVAF) exhibiting one or more risk factors. Two dosage regimens are recommended: 5mg twice daily or 2.5mg twice daily; the latter is deemed appropriate if creatinine clearance (CrCl) 15-29 ml/min or at least two of age ≥ 80 years, body weight ≤ 60 kg, or serum creatinine ≥ 133 micromol/L are satisfied. These criteria derive from results of two large successful clinical trials1–2 and have formed the basis of local prescribing guidelines.

Objectives
• To audit against the following standard:
  • 95% of patients prescribed apixaban for NVAF should be assigned a dose in terms of weight, age and renal function in accordance with local guidelines.
  • To analyse dose reduction criteria met by patients to ascertain why their prescribed doses were inappropriate
• To identify any significant differences in adherence to guidelines according to gender and age.
• To identify any differences to dose recommendations when different measures of renal function (CrCl based on actual body weight, CrCl based on ideal body weight and estimated Glomerular Filtration Rate [eGFR]) are used.
• To review audit results and make recommendations for future practice.

Method
Patients discharged from cardiology wards between 8th June and 8th December 2015 who were prescribed apixaban for NVAF were included in this audit. A data collection form was developed to gather relevant data, which included age, weight, height, creatinine and eGFR. Data was collected retrospectively using Clinical Portal and Trakcare™. Microsoft Excel and Minitab software were used to analyse compound data and generate relevant statistics. This audit did not require ethics approval.

Results
Of the 104 patients identified, six patients could not be assessed due to missing data. Approximately three quarters (73%) of the remaining patients were prescribed an appropriate dose according to guidelines. No significant differences in adherence rates were found between males and females (p=0.209) or between patients aged 80 or over and patients aged 79 or under (p=0.161). The majority of patients (68%) prescribed a subtherapeutic dose were aged 80 or over, indicating that age was a potential contributing factor for ‘underdosing’ patients. There were minor differences in the rates of recommended dose reductions when applying different measures of renal function (range: 21 - 26.5%).

Conclusions
This audit has shown that current evidence-based guidelines are not being fully adhered to, especially when prescribing for elderly patients. Consequently, these patients are potentially put at risk of subtherapeutic dosing, in turn increasing their probability of stroke. Current published evidence does not justify reducing doses based solely on age, despite anecdotal concerns of local prescribers of an increased risk of haemorrhage. Prescribers should remain vigilant and document any reasons for dosing the product outside of its licence.

References

56. Electronic Risk Assessment as a Means of Directing a Clinical Pharmacy Service
Emma L Suggett, University Hospitals Birmingham NHS Foundation Trust, Professor John Marriott, University of Birmingham

This study did not require ethics approval.

Background
Risk assessment is increasingly being explored as a methodology to direct and improve efficiency of hospital clinical pharmacy services in the United Kingdom (UK). However, none of these methods have used evidence-based risk factors for the requirement of pharmaceutical intervention. This research aimed to develop a new work model for inpatient review by pharmacists based on the risk assessment of patients using an electronic prescribing and administration system (EPMA). The intention was to develop an electronically generated risk score directing pharmaceutical expertise to those inpatients most in need in a 1,300 bedded teaching hospital.

Objectives
To undertake a systematic review to identify risk factors associated with the requirement for clinical pharmacy intervention and determine if these can be measured by the EPMA in a UK teaching hospital.
To determine if the potential risks identified can be used to develop a risk score identifying medical and surgical patients at high risk of pharmacy intervention.

Method
A systematic review searched ten databases (including Medline, Embase and Cochrane) and eleven journals (peer reviewed) using the principles in the PRISMA statement [1]. Data covering a 2 year period was extracted from the EPMA relating to measurable risks in recipients of interventions and those patients present concurrently. Only intensive care patients and stays <24 hours were excluded.
Univariable analysis showed the rate of intervention at 7 days for each risk factor. Multivariable analysis using Cox regression on 75% of data, identified independent predictors and enabled calculation of a risk score. The remaining 25% was used as a validation set and receiver operating curves (ROC) determined predictability of the score.

Results
Analysis of 58,918 admissions indicated that the following factors were independently and significantly associated with an increased chance of pharmacy intervention: age, female gender, requirement for a blister pack, refusal of medicines, out of stock drugs, prescription of warfarin, number of allergies, comorbidities, regular prescriptions, anti-epileptics, thrombolytics/anticoagulants, central nervous system agents, and chemotherapy /
immunosuppressants. Age was the dominant risk factor. Paradoxically a decrease in interventions was seen in the following groups: liver and renal impairment, prescription of opiates, IV antibiotic or diuretic and the presence of an INR result. The area under the ROC for the risk score was 0.61. This was little improvement over using the individual factors alone as predictors of intervention.

Conclusions
Multiple risk factors were identified and shown to be significantly and independently associated, with an increased likelihood of pharmacist intervention. However it was not possible to generate a useful model for directing clinical pharmacy services. We demonstrated inverse relationships between some risk factors usually associated with problems with medicines use (most notably liver and renal impairment). Hitherto there has been an assumption that pharmacists target risks associated with adverse outcomes for medicines however, this research indicates that risks which they target in practice, may differ.

References

57. Utilisation of 'One-Stop Dispensing' medicines within the Acute Medical Units for discharge
Precious Akhuemokhan, Fatima Suleiman, King’s College Hospital NHS Foundation Trust

This study did not require ethics approval

Background.
The dispensing of medicines for discharge termed ‘One-Stop Dispensing (OSD)’ is where a labelled supply of patients’ regular medicines is provided to cover inpatient stay and the two-week period post discharge. This system which was introduced into secondary care was believed to reduce waiting times for discharge medication and relieve bed pressures [1]. One possibly unforeseen weakness of OSD in high turnover wards like the admissions wards manifests when, for whatever reason, medicines for patients with longer stay than initially anticipated do not follow them through to discharge

Objectives.
• Carry out assessments on all OSD medicines that have been dispensed for the admission wards for December 2015 which should have been included in the patient’s discharge medications (TTO).
• To identify items that were issued using OSD and the proportion which had to be re-dispensed on discharge.
• To measure the cost of re-dispensed items

Method.
All OSD transcription sheets from AMU 1 & 2 for December 2015 were collated. The JAC dispensing program was used to ascertain the proportion and cost of re-dispensed medicines.

Results.
All the OSD items included in this audit were sufficient to provide 2-4 week supplies of the patient medicines. The total number of OSD items evaluated was 339, 239 of which were dispensed only once throughout in-patient stay. 65% (156/239) of these one-time issue items were utilised in discharge. The remaining 35% (83/239) consisted of medicines that were not needed on discharge like antibiotics with short courses, STAT doses or discontinued therapy. Re-dispensed items constituted 29% (100/339) of the total number of OSDs. 59% (59/100) of re-dispensed medicines were due to losses on AMU1&2 or on ward transfer. The ‘lost’ items thus represent 17% (29/339) of the total number of OSDs; the cost of which was found to be approximately £1352 for the month of December 2015. The remaining 41% (41/100) of re-dispensed items were issued when more medication was required for longer in-patient stay or when a further supply was required to provide sufficient therapy for a TTO.

Conclusions.
The objective was to evaluate the efficiency of OSD in admissions wards which are typically high turnover. Although OSD has been shown to facilitate discharge in the majority of cases (65% = 156/239) there is the issue of lost medicines and subsequent cost to the Trust; extrapolated to £16,224 annually. These losses could have occurred in instances where patients were moved without their medicines and as a result a second request of the item would have had to be made on arrival at the destination ward. Targeted training is thus recommended for nursing staff directly involved in patient discharge/transfer to educate on the need for patients to be accompanied with their medicines throughout their journey. This would maximise efficiency of OSD by avoiding wasting staff time, reduce costs to the trust, ensure timely discharge from the wards, reduce A&E waiting times and help relieve the pressures of increased workload on the dispensary

References

Niamh Thompson, Sara Moore, Harrogate District Foundation Trust, Harrogate

Background:
Anticoagulation services operated as point of care testing until 2012 when this was changed to a postal service. Initial surveys were designed to identify whether this alteration affected patient satisfaction. Subsequent reviews were to continually monitor the service.

Objectives:
• To evaluate whether patients were satisfied with the anticoagulant services they received.
• To ensure that patients prescribed anticoagulants received verbal and written information.

Method:
The audit was carried out over 5 day periods in 2011, 2013 and 2015. Patients due blood monitoring during the study period were asked to complete a questionnaire. Ethics approval was not required.

Results:
Heart failure (HF) is a complex clinical syndrome that can result from any structural or functional disorder reducing the heart’s ability to function. Treatment is directed according to classification of HF, with prognostic benefit being proven only in patients with left ventricular systolic dysfunction (LVSD). Evidence from clinical trials indicates that optimal doses of angiotensin-converting enzyme inhibitors and beta-blockers reduce mortality, hospital admission rates and improve symptoms and quality of life. HF has high mortality and admission rates in Lambeth and Southwark. Only 50% of patients with LVSD in primary care are receiving evidence-based treatment. Multidisciplinary team interventions have shown to benefit patients with HF by initiation and titration of HF medications. A caseload review involves a multidisciplinary discussion between general practitioners (GPs) and a specialist pharmacist with a focus on medicines optimisation.

### Reference


### Method

Each GP practice has a HF register which has four indicators for the QOF. These indicators comprise accurate diagnosis codes and optimal medication therapy. At each review the pharmacist makes recommendations and agrees an action plan for the practice to follow. Interventions made were recorded and data from twenty practices between April and December 2015 were analysed. GP satisfaction was obtained using a questionnaire.

### Results

434 patients were reviewed in twenty GP practices. Of those, a total of 391 (90.1%) patients had a confirmed diagnosis; 261 (60.1%) had LVSD. 43 (9.9%) patients were identified on the HF register with an unclear diagnosis, requiring an echocardiogram to confirm. 69 (16%) patients required re-coding. 28 (6%) patients were inappropriately on the HF register and were subsequently removed.

In total, 366 interventions were made which included optimisation or initiation of medication and correcting the HF code. Suggestions were also made to manage cardiovascular risk factors, monitor signs and symptoms and facilitate referrals to the community HF team or cardiology clinic. All respondents (100%) were satisfied with the way the meetings were arranged. Similarly, 80% of GPs agreed it was beneficial on managing HF patients and regarded the service as a valuable learning experience.

### Conclusions

This project identified that pharmacist-led caseload reviews can help manage HF in primary care and facilitate practices meeting their QOF targets. It also demonstrates how pharmacists can improve patient care through medicines optimization, and by providing education and support to GPs. This study could be improved by monitoring indicators such as HF symptoms and hospital readmission frequency and comparing this to areas where this service does not exist.

### References

Improving Patient Safety using eDocumentation Creation in Aseptic Services

Tyrrell GP, Cwm Taf University Health Board

Context
The project described was undertaken by staff at the Aseptic Service Unit at the Royal Glamorgan Hospital.

Problem
Current documentation practices in Aseptic Services vary greatly across the NHS. Many manual methods of documentation creation expose the patient to risk such as incorrect transcription, calculation, expiry and dosage/strength. Many steps in the documentation creation process have the potential to lead to serious patient harm if undetected. A gold standard method of worksheet and documentation creation would provide electronically automated worksheet and label creation to remove risk from documentation systems.

Assessment of Problem
As part of good quality management in Aseptic Services errors relating to documentation are recorded and investigated allowing trending to occur. This information was assessed, along with national error data to identify common documentation errors. Coupled to this HACCP analysis of the documentation process identified common steps where errors may occur.

Intervention
To improve documentation safety an electronic documentation creation system was designed with the aim of automating all high risk process steps identified within the initial assessment and in previous research. This automation would serve remove risk from the worksheet and labeling process whilst improving efficiency.

Strategy for Change
The high risk steps identified for automation were:
- Automatic dose calculation
- Calculation of minimum and maximum concentration limits for infusion volumes
- Calculation of product ingredients specific to each patient dose
- Expiry date calculations

The strategy for redesign of the documentation process focused on the above points with an aim to minimising the number of manual points of electronic data entry and automating these steps in the process where possible.

Measurement of Improvement
To assess the impact on patient risk, both systems of documentation creation were process mapped from the point of clinical check to the approval of the documentation for production activity. This was undertaken for each individual product made within the unit. Each step requiring input of data was recorded, and each step given a risk-rating based on the NPSA patient safety tool. No ethics approval was required.

Effects of Change
Results from the process mapping and risk assessment showed that the electronic documentation system reduced the average number of data entry steps from 10.88/product to 6.2/product. The steps with a high risk to patient safety were reduced from 2.58/product to 0.46/product.

Conclusions
Introduction of a validated electronic documentation system can greatly reduce the risks inherent in product worksheet and label documentation suggesting all manufacturing units should move towards the use of electronic documentation creation.

References

Improving discharge process from Acute Admissions Unit (AAU) within a district general hospital

Vaghela T, Wright E, Foad S, Pose P, Canning A

Background
Acute admissions unit beds are a tight resource within a hospital. With surge pressures and breaching the four hour targets in A&E, every available bed is very valuable resource. Time taken to free these beds is therefore an important factor for pharmacy to consider. The Trust target for To Take Away (TTA) turnaround time is 60 minutes. In recent years we have improved the discharge process with the introduction of a dedicated discharge bleep. This process improved the screening turnaround times but not the dispensing times. An AAU remote dispensary (ARD) which holds stock that can be labelled and dispensed to patients was set up in the unit. Not all TTA’s can be dispensed via this ARD; controlled drugs, fridge items and non stock items are sent to the main dispensary.

Objectives
To determine the impact of ARD on the acute admissions discharge process by measuring the effect of the remote dispensary on reducing dispensing times for AAU TTAs.

Method
Each TTA dispensed via the main dispensary and via the ARD has the “ward” “time in” and “time out” logged in the electronic pharmacy system. The AAU TTA turnaround times were recorded for three months (August 15 to October 15) prior to the ARD being operational and for the observational period Nov 2015 to May 2016. This study did not require ethics approval.

Results
598 TTA’s were dispensed from AAU with an average turnaround time of 94 minutes during the three months prior to operation of ARD. The main dispensary average turnaround for all Trust TTA’s during this period was 115 minutes. 1460 TTA’s were dispensed from AAU during the study period. 45% (n=657) were dispensed using the ARD with a turnaround time of 18 minutes. This led to a reduction in average turnaround time for all AAU TTA’s (94 to 57 minutes).
Conclusion
The introduction of the ARD has reduced the TTA turnaround times by 81% for TTA dispensed via the ARD and by 39% for all AAU TTA’s. However this study did not account for reduced transit time between the dispensary and the patient. The ARD has also had an impact on the average turnaround time in the main dispensary for all Trust TTA’s (115 minutes to 103 minutes). The ARD has not required any extra staffing but has involved adapting our team roles to take into account this discharge pathway. Having Summary Care Records access allowed us to use the medicines management technicians to prioritise discharges without any impact on the numbers of medicines reconciliation completed. The reduced dispensing time also led to faster discharge with the patients going home with their medicines on discharge instead of returning for them later. However the success of ARD has resulted in reaching its current maximum capacity. We are currently exploring further developments such as having TTA’s prescribed by pharmacists and developing a remote dispensary in the discharge lounge. The implementation of ARD also supports Lord Carter’s recommendation on pharmacy services being more patient centred.

References

62. Reducing Omitted Doses of Critical Medicines
Wake N, Henderson E, Gilson J, Northumbria Healthcare NHS Trust

Context
This multidisciplinary initiative is taking place across four acute hospitals and six community hospitals in an acute Trust; led by the Medication Safety Officer and Chief Matrons.

Problem
Local audits showed that although individual projects to reduce omitted doses led to improvement, this was not sustained over time.

Intervention
Medication Safety Thermometer (MST) methodology 1 was adopted, where all omitted doses over a twenty four hour period are counted every month. Critical medicines are identified and reasons for omission are documented according to MST definitions. All wards in the Trust are included, with pharmacy and nursing staff collecting data together. All wards receive monthly feedback as an individualised monthly dashboard and action plan. Ward managers are engaged via one to one meetings, senior nurse leadership and workshops at ward managers’ away days. Monthly thematic analysis and trust wide actions are discussed at Senior Nurse Forum and Medicines Management Committee and, as reducing omitted doses of critical medicines is now a quality account measure, at Safety and Quality Committee and Trust Board.

Effects of Change
In April 2014 3.5% of patients experienced an unacceptable omitted dose of a critical medicine, excluding where the patient refused, or where there was a valid clinical reason for refusal (26 out of 753 patients), reducing to 0.9% by July 2016 (6 out of 637 patients). The improvement has not been steady, however monthly data collection with timely feedback and discussions with ward staff allows responsive implementation of local actions: examples include amending ward stock to make critical medicines available; reviewing ward practices so patients who are asleep during administration rounds have the time of their prescriptions amended; and following up unaccounted for omitted doses in a timely fashion. MST data shows the Trust performs significantly better than the national median 1 in acute settings in July 2016 7% of patients experienced an omitted dose of a critical medicine (including where the patient refused or where there was a valid clinical reason for omission).

Conclusion
In contrast to previous short term interventions 2, regular measurement, feedback and engagement at all levels, individualised action plans and inclusion as a quality account measure has led to a reduction in the number of patients experiencing an omitted dose of a critical medicine. Collaborative working has led to this approach being adopted by a neighbouring Trust, where there has been a 50% reduction in the percentage of patients experiencing an omitted dose of a critical medicine. Measurement and feedback will continue through 2016/17 when it is anticipated that the implementation of an electronic prescribing and medicines administration (EPMA) system will support further reductions in the number of unaccounted for omitted doses which remains the main reason for critical medicine omission.

This study did not require ethics approval.

References
1. NHS Safety Thermometer. Available at www.safetythermometer.nhs.uk (last accessed 25 August 2016)

63. Medication changes during the inpatient stay - not that easy to follow
Ware O1, Wilcock M2, Hill A2, Lawrence J1, Nicholls I2, Miles S2, 3rd year medical student, University of Exeter Medical School, 2 Pharmacy Department, Royal Cornwall Hospitals NHS Trust, Truro

Background
When patients are transferred across healthcare settings e.g. at hospital admission and hospital discharge, medication-related information is often incomplete. Discrepancies in medication history may result in discontinuity of care and patient harm. At discharge, the patient’s general practitioners (GP) should be advised of the discharge medication and given information about reasons for medication changes occurring during the inpatient stay. 1

Objectives
The objectives were to assess the completeness of information in electronic discharge letters in relation to medication changes made during the inpatient stay, and to consider actions necessary to improve the service. This study did not require ethics approval.

Method
Fifty patients discharged in February 2016 were identified through the hospital’s electronic prescribing system. Inclusion criteria were that the patient’s medication had been reconciled at admission by pharmacy, and the discharge list contained 5 or more medicines. The discharge medication
was compared to the list at admission, and changes made during the inpatient stay noted. The e-discharge letter was reviewed to ascertain if these changes were recorded.

Results
Prescriptions for these 50 patients contained 493 medicines at admission (mean 9.8 per patient, range 3-22) and 562 (mean 11 per patient, range 5-23) at discharge. Overall, 70% of patients were discharged with more medicines than they were admitted on. All patients had some changes to their medication. Of these changes, 30.3% of added medicines and 51.4% of discontinued medicines were not explained in the e-discharge. Overall, 48% of discharge summaries contained at least one incomplete message about changes.

Conclusions
Our electronic prescribing system is not able to capture and provide this information about changes automatically, and busy junior doctors may not realise the importance of communicating medication changes to the GP. Junior doctors are often asked to complete an e-discharge for patients they may not have seen previously, and hence may find it difficult and time consuming to untangle what has happened with a patient’s medication. Others have found similar results with changes not being documented. One small study found that details of medication changes were considered most important by 39% (13/42) GPs and 12% (4/36) junior doctors. Limitations of this study include a small sample in one hospital, and no attempt to examine patient notes to see if changes were explained there. However, even if this was the case it does not assist the GP who receives the e-discharge. Further work is underway to explain to junior doctors the importance of correct documentation for primary care, and to look at hospital pharmacists summarising key changes for a separate discharge communication for the GP.

References
1. NICE NGS. Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes. March 2015.
2. Croft MT, Cavill K. Service evaluation to assess the quality of communication on discharge letters regarding changes to medication and make recommendations for improvement. 11th UKCPA Joint National Conference, 2015.

Background
The All Wales Medicines Strategy Group (AWMSG) currently advises warfarin as first-line therapy where the decision has been made to start an anticoagulant in AF (1). Where warfarin is ineffective (TTR <58%) or contraindicated, one of the DOACs may be an option after a full discussion with the patient. The AWMSG published a risk/benefit assessment tool (1) for anticoagulation treatment in patients with AF which should be completed by the prescriber and filed in the patient’s notes. Currently, BCUHB has the highest prescribing rate for DOACs in Wales, where Flintshire and Wrexham have the highest rates respectively.

Objectives
- Identify if DOACs have a clear indication documented in the patient notes
- Determine if patients receive warfarin unless contraindicated or ineffective (TTR<58%)
- Investigate the percentage of patients with CHADS2 or CHA2DS2-VASC documented in their notes
- Determine if a risk assessment tool has been completed and filed in patient notes
- Investigate if doses take into account renal function, age and weight
- Assess the percentage of patients that have had an annual review

Method
Data was collected by myself in primary care by visiting 8 GP surgeries from 43 in the Wrexham and Flintshire locality. Surgeries were selected to include a spectrum of DOAC prescribing rates across both counties. EMIS web and Vision systems were be used to collect data. A database search using the population reporting function found patients currently prescribed rivaroxaban, apixaban and dabigatran. Each patient’s record was accessed to complete the data collection form. This study did not require ethics approval.

Results
Standard targets were set at 100% (n=236 unless otherwise stated).
1. 100% of DOACs had a clear indication documented
2. 89% of patients had a CHADS2 or CHA2DS2-VASC documented
3. 3% of patients had a risk assessment tool completed
4. 67% of doses took into account renal function, age and weight
5. Deviations from the guidance were documented 53% of the time (n=139)
6. 5% of patients had an annual review (n=61)

Conclusion
Overall, the tool was poorly utilised in practice, possibly impacting on other audit standards. Possible reasons, from speaking to GPs, include not being user-friendly and time-consuming. Implications include incorrect dosing, a lack of documentation and an unnecessary prescribing cost burden. Findings were concerning due to the high-risk nature of these drugs. Limitations of the audit include using the GP system for data collection which excludes documentation in secondary care. Also, one practice had a particularly high rate of prescribing which may have influenced the results.

Primary care practitioners need to make improvements in documentation, reviewing patients after 1 year, their general awareness of dose adjustments and monitoring requirements. The audit will be used to generate discussion at local cluster meetings and has prompted the creation of a trust DOAC dosing calculator. It would be useful to hold education sessions for prescribers.

References
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65. Resolving Unintentional Discrepancies during the Medicines Reconciliation Process
Chui Yan Yip, Kirsty Cavill, Harrogate and District NHS Foundation Trust

Background
Medicines reconciliation (MR) is defined by the Institute for Healthcare Improvement as ‘the process of identifying an accurate list of a person’s current medication and comparing them with the current list in use, recognising any discrepancies and documenting any changes’(1). The National Institute for Health and Clinical Excellence (NICE) said the number of discrepancies fell after pharmacist involvement(2). Discrepancies should be resolved within 24hours(3) in order to prevent omitted, delayed or incorrect medicines administration. 89% of MR at HDFT occurs within 24hours(3). Data on how quickly discrepancies identified using the National Patient Safety Agency (NPSA) 2007(2) criteria are resolved has not been investigated. The MedChart electronic prescribing system is in place and used to document MR and flag discrepancies.

Objectives
- Identify number of drugs histories with unintentional discrepancies found during MR
- Identify methods used to communicate with prescribers regarding unintentional discrepancies e.g. alerts on MedChart etc.
- Identify average time taken for unintentional discrepancies to be resolved using different methods.

Method
This study did not require ethics approval. A data collection form was used by pharmacists on adult medical and surgical wards. Paediatric and maternity wards were excluded as they do not have regular pharmacist cover. The study was conducted from 07/12/15 to 11/12/15.

Results
- Total number of MR recorded was 103
- 54.4% had unintentional discrepancies identified. The discrepancy rate was 1.8 per patient.
- On average it took less than 1 day (23.40hours) for perceived significant unintentional discrepancies to be resolved (range 10minutes – 168hours).
- On average it took just over 1 day (27.50hours) for perceived insignificant unintentional discrepancies to be resolved (range 1minute-240hours).
- Where pharmacists were involved in surgical pre-assessment there was a lower discrepancy rate.
- Average time taken for unintentional discrepancies to be resolved using the following methods:-
  - Clinical review on MedChart - 30.07hours
  - Patient Alert on MedChart - 13.99hours
  - Oral communication with prescriber – 22.50hours
  - Pharmacists amending prescription – 0.08hours
  - Combination of above including writing in medical notes – 17.55hours

Conclusions/ Discussion
Despite given the NPSA criteria for significant discrepancies, pharmacists used their own clinical judgement to determine whether a discrepancy is significant. Perceived significant clinical discrepancies are resolved quicker than insignificant discrepancies. Discrepancies were resolved quickest when pharmacists amended the medicines within their own competency. Increasing the number of pharmacist prescribers could reduce the time to resolve discrepancies. Using clinical reviews on MedChart took the longest to be resolved if another method was not used in combination. Consultation with medical staff to identify the most effective methods of communication following this study has started. Increasing pharmacist involvement in surgical pre-assessment clinics will reduce the number of unintentional discrepancies in this area.

References

Invited Poster (exempt from poster award)
66. Specialist or Advanced Generalist Pharmacist?
Medlinskiene K., Hull and East Yorkshire Hospitals NHS Trust, Hull, Preece, D., Leeds Teaching Hospitals NHS Trust, Leeds

Introduction
The training of registered hospital pharmacists starts with the foundation pharmacy framework (FPF), which is usually achieved by completing a clinical diploma. The current hospital pharmacist career progression through FPF to the Advanced/Consultant pharmacy framework is described as horizontal with pharmacists becoming specialist pharmacists(1). Recently a greater need of advanced generalist pharmacists was emphasised by Dr Keith Ridge, Chief Pharmaceutical Officer (Eng.), and supported by professional bodies such as the RPS and the UKCPA(2). This challenges status quo by implying vertical differentiation(3) and raises a question: is becoming an advanced generalist considered as a career option by hospital pharmacists?

Aim and Objectives
This work aims to explore the views of current hospital pharmacists on becoming specialist or advanced generalist pharmacists.

Method
An online survey questionnaire (via Survey Monkey) was designed and piloted before being launched via e-mail and social media during the 9th May 2016 to 19th June 2016. Both quantitative and qualitative questions were included in the questionnaire and an explanation of terms was provided. Analysis was conducted by descriptive and comparative statistical method. This study did not require ethics approval.

Results
53 hospital pharmacists responded to the online survey. More than half of respondents (33) were foundation hospital pharmacists. The most common workplace was teaching (30) and district general hospitals (19). The most common reported rotations (>40% of respondents) were general surgery, care of the elderly, medicine information and paediatrics with the most positive responses from general surgery, care of elderly, cardiology, oncology and medicine information rotations. Reasons for favouring these rotations were pharmacist impact on patients’ care, integration in multidisciplinary team working, and learning opportunities.

Questions related to specialist and advanced generalist pharmacists were completed by 38 respondents. The majority agreed that specialist (33) and advanced generalist (34) knowledge was important for working as a senior pharmacist. Half of the respondents (18) with varying number of rotations from 1 to >10 aimed to become specialist pharmacists mainly due to an interest in a specialist area, career progression, salary, and/or availability of jobs. Only 9 stated advanced generalist pharmacist as a future career and yet these were pharmacists with more than 5 rotations.

Discussion and Conclusions
Traditionally the need to specialise coincided with career progression and higher paying jobs. However, emerging new roles, e.g. general practice pharmacists, and greater recognition of pharmacist’s role in the medicine optimisation, governance and safety[1] will require more advanced generalist pharmacists. This survey indicates that hospital pharmacists generally seek to become specialist pharmacists in their careers. A more clearly defined career structure is required to encourage more hospital pharmacist to choose advanced generalist career.

References

BPSA Conference 2016 Winning Posters

67. Adherence to Trauma and Orthopaedic antibiotic prophylaxis guidance for patients with metal implants
Emily Dustan & Anneka Mitchell, University Hospital Southampton

Background:
Peri-operative antibiotic prophylaxis is routine for surgery involving insertion of metal implants.[2] Due to the possible increased acute kidney injury (AKI) risk with high dose (8g/24hrs) flucloxacillin,[2] UHS T&O guidelines have recently been updated, now reflecting research showing low dose (4g/24hrs) flucloxacillin plus gentamicin provides adequate antibiotic prophylaxis whilst reducing AKI risk.[3] operatively, gentamicin from 160mg to 2mg/kg (maximum 160mg) at induction. This audit aims to review peri-operative dosages of flucloxacillin and gentamicin, and post-operative prescribing of flucloxacillin, to ensure adherence to updated guidance.

Objectives:
1. Review peri-operative flucloxacillin doses to ensure adherence to reduced dosage guidance.
2. Review peri-operative gentamicin doses to ensure appropriate weight-based dosing.
3. Review prescribing of post-operative flucloxacillin to ensure 3 doses are given.
4. Review renal function post-operatively, to investigate whether AKI is more common in patients receiving flucloxacillin and/or gentamicin above recommended doses.

Method:
During a 5 working day period, all patients who had metalwork inserted during their current admission on orthopaedic wards were identified. Peri-operative prescribing was taken from the patient’s anaesthetic chart, with post-operative information from the hospitals e-prescribing records (JAC). Gentamicin doses were classified as appropriate if it calculated as 2mg/kg rounded to the nearest practical dose (80, 120 or 160mg). Outcome data was collected for those diagnosed with an AKI within 7 days of their operation.

Results:
53 patients were eligible for inclusion in the audit. 28.3% were given correct intra and post-operative flucloxacillin treatment; 47.2% received treatment that partially deviated from protocol; and 24.5% of patients received both intra and post-operative flucloxacillin doses that deviated from protocol.

Only 36/53 patients had a recorded weight. Of these, 41.5% were given an appropriate gentamicin dose, a further 44.5% received a higher than recommended dose. Excluding patients with no recorded weight, only 5 patients (9.4%) received their total antibiotic prophylaxis as per protocol. Seven patients were diagnosed with post-operative AKI. Although these diagnoses cannot be directly attributed to antibiotic dosing, it is interesting to note that of these, five patients (over two thirds) received flucloxacillin and/or gentamicin at higher than recommended doses. This outcome measure will be included in a future re-audit.

Recommendations:
1. Increased advertisement of guidelines through posters on wards and in theatres, plus briefing of anaesthetic teams.
2. Education for doctors regarding the need for 3 post-operative doses of flucloxacillin and the correct prescribing of these on JAC; with possible introduction of a specific protocol.
3. Investigation into documentation of weights, to ascertain whether these could be translated onto JAC.
4. Re-audit after the above recommendations have been addressed.

References:
68. Is there a role for veterinary pharmacy in the management of dairy mastitis?

William Northwood, R Price-Davies, S Cockbill and C Allender
Cardiff School of Pharmacy and Pharmaceutical Sciences, Cardiff University, King Edward VII Avenue, Cardiff

Introduction
Dairy mastitis is inflammation of the mammary gland (udder tissue) in response to bacterial infection. Mastitis is the largest dairy health problem in the United Kingdom, causing reduced milk yield and quality. Veterinary Pharmacists can support farmers treating mastitis, encouraging prudent use of antibiotics, allowing for lower resistance, more effective treatment and reduced recurrence of clinical mastitis infections.

Aims
This study aims to explore factors influencing dairy mastitis incidence, understand rationale behind antibiotic treatment and explore requirements for veterinary pharmacists to educate farmers.

Method
A semi-structured interview was undertaken with a representative sample of 18 dairy farmers from Staffordshire and South Wales. A pilot study was carried out and the interview questions refined in response to pilot feedback. Qualitative questions looked at causative factors, diagnosis, treatment and provision of advice. Quantitative data for monthly mastitis cases were collected, digitized and analysed using GraphPad Prism. A one-way analysis of variance with Tukey’s post hoc test compared mastitis rates between farms. A t-test determined the significance of farm mastitis rates against the overall mean. Differences in individual farm mastitis rates were attributed to variations in farming practices. This study required and received ethics approval.

Results
Mastitis rates varied significantly between farms but no clear correlation was seen with farming practices. The quality of staff and harsh culling policies had major impacts on mastitis incidence. Standard Operating Procedures for the use of antibiotics were exhibited by 79% of farms. Furthermore, 21% of farms weren’t aware of antibiotic resistance. Upon observation of antibiotic usage, blanket treatment for sub-clinical mastitis cases and finishing antibiotic courses early was seen. Current treatments hadn’t been changed for over 24 months at 63% of farms, suggesting inappropriately targeted antibiotic use and emergence of resistant bacterial strains. Only 16% knew what a veterinary pharmacist was, with one farm using one, proving a need for education on the professional services offered by a veterinary pharmacist to dairy farmers.

Conclusions
Veterinary pharmacists aren’t currently playing an active role in dairy mastitis management. Limited advice means farmers adopt a ‘trial and error’ approach to reduce mastitis incidence. Antibiotics are routinely supplied to farmers with little instruction on appropriate usage protocols. Education is key to preventing emergence of resistant bacterial strains. There is a need for true collaboration between pharmacists, veterinarians and farmers, with a particular focus on appropriate antibiotic targeting, advice and treatment therefore tackling antimicrobial resistance. There is clearly scope for a veterinary pharmacist to work alongside veterinarians in the management of dairy mastitis.

References

Regional Pre-Registration Pharmacists Project Winners 2016

A. An audit of prescribing for patients detained under the Mental Health Act
Michael Baker-Kukona, University Hospitals of Leicester NHS Trust, Leicester;
Rachel Calton, Leicestershire Partnership NHS Trust, Leicester

Background
Patients detained and treated for a mental disorder under the Mental Health Act 1983 (MHA) for longer than three months must have a certified treatment plan detailing the medications that can be used for the remainder of their detainment. Administering medication outside of these specifications is illegal and a violation of patient rights. Pharmacists can play an important role by identifying unauthorised prescriptions at the time of professional checking, and informing prescribers. Recently, the Care Quality Commission (CQC) highlighted cases of unauthorised administration of medications to detained patients in their inspection report of Leicestershire Partnership Trust (LPT).

Objectives
The objective is to audit the legality of prescriptions for patients detained under the MHA who have been treated for a mental disorder for more than three months at LPT. This will be measured via the following standard: One hundred percent of treatment plans (documented on T2/T3 forms) should authorise all current inpatient prescriptions for the treatment of a mental disorder for each relevant patient. A target of 100% was chosen since this is a law and any deviation is illegal.

Method
A report of all LPT inpatients with T2/T3 forms was produced on 8th December 2015. Data was collected between 8th and 11th December 2015. Patients on the list who were discharged or whose detention had ended at the time of data collection were excluded. Treatment plans from T2/T3 forms were compared with electronic inpatient medication charts. Unauthorised prescriptions were brought to the attention of the ward pharmacist to resolve. This study did not require ethics approval.

Results
A total of 73 forms (22 T2 and 51 T3) and corresponding medication charts were reviewed. Of these forms, only 52 (71%) authorised all current inpatient prescriptions for the treatment of a mental disorder (73% of T2s and 71% of T3s). A total of 30 unauthorised prescriptions that had been administered were identified: 10 adjuvant medications, 7 hypnotics, 5 antipsychotics, 5 anxiolytics, 2 anti-epileptics used as anxiolytics and 1 anti-manic medication. During the course of the audit it was also found that the Pharmacy Department did not have the most up-to-date T2/T3 forms for 16 patients (22% of total).
Conclusions
LPT did not comply with the audit standard, meaning that rights of vulnerable patients were violated. This is a multidisciplinary problem with prescribers, pharmacists and nurses all failing to identify prescribing outside of T2/T3 specifications. A recommendation is to provide education on the MHA, tailored to each discipline and the role each plays in eliminating unauthorised administration of medications. The audit also revealed that the Pharmacy Department did not always have the most up-to-date treatment plan information, highlighting an area for process improvement. Importantly, pharmacists cannot appropriately identify unauthorised prescriptions without accurate treatment plan information. Limitations of the audit are that it only provides data for a snapshot in time and is specific to LPT. However, these findings suggest that any Trust with patients detained under the MHA could benefit from a similar audit to ensure compliance with the MHA.

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<th>B. Prevalence and awareness of the Insulin Passport at Royal Stoke University Hospital</th>
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<td>Brockley, D. and Sleigh, J., Pharmacy Department, University Hospitals of North Midlands NHS Trust, Stoke-on-Trent</td>
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Background
Deaths and severe harms have resulted from errors in Insulin administration; Insulin appears among the top 10 high-risk medications worldwide [1]. The NPSA issued a Patient Safety Alert in 2011 placing a duty on prescribers to offer a patient held record card, the Insulin Passport (IP), and patient information booklet (PIB) along with appropriate counselling for patients prescribed insulin. Several high strength insulins and biosimilars have recently come to market, prompting the MHRA to issue draft guidance recommending giving patients written information and an IP before starting treatment [2].

Objectives
This audit assessed the adherence of prescribers to the NPSA alert and patient’s awareness of the IP against the following standards:
- a) Patients initiated on insulin should be offered an Insulin Passport at the time of prescribing. (100%)
- b) Patients should have their Insulin Passport updated or a new one issued when the insulin brand or device is changed. (100%)
- c) Patients should receive counselling on its use. (100%)
- d) Patients should receive written information on its use. (100%)

Method
This study did not require ethics approval. Patients were selected by nurse identification and chart screening for insulin prescription. Inclusion criteria was any patient over the age of 18, prescribed insulin, whom nursing staff believed able to take part in a short interview. Patients were excluded if confusion or dementia was documented in the notes. Where consent was given data was collected from the medical notes, and the patient interviewed using a short questionnaire.

Results
47 patients from medical and surgical wards were identified as insulin users. 43/47 were established on insulin pre-admission, with 4 being newly prescribed. Overall 19% (n=9) stated they had been offered an IP, all of which were established on insulin pre-admission.
4% (n=2) patients had changes to their insulin product, and had no recollection of being offered an IP.
100% of patients who were issued with an IP reported receiving counselling, with 78% (n=7) recalling that it was for use in an emergency, and two patients also stated its use as an identification aid. 22% (n=2) of patients could not recall any purpose.
66% (n=6) patients recalled receiving an information booklet with their Insulin passport.

Conclusion
This audit demonstrates that the introduction of the IP has not been successfully implemented in the local health economy. Feedback and discussion with the diabetics team and review/update of the process for the issue of IPs and PIBs has reinforced the benefits of the IP in patient safety. Future collaborative work with CCGs could empower patients to become more engaged with their insulin treatment and improve safety.

References

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<th>C. Antibiotic prophylaxis in cardiothoracic surgery</th>
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<tr>
<td>Sara El-Harari, Project supervisor: Ruth Coxhead, Royal Victoria Hospital, Newcastle upon Tyne</td>
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</table>

This study did not require ethics approval

Background:
To reduce the risk of surgical site infections (SSIs), the NuTH guidance for antibiotic prophylaxis in cardiothoracic surgery specifies choices of IV antibiotic [1]. For cardiac surgery there is no guidance with respect to dosing in patients between 100-120kg. In many cases a pre-surgical oral dose of prophylactic antibiotic is prescribed with the rationale that this will ensure that the prophylactic dose will not be missed. There are several issues in doing this, not only does this contradict the guidance and current evidence base [2,3], but giving an oral dose pre-induction may not be effective if the surgery is delayed or cancelled for any reason.

Objective(s):
To determine whether antibiotic prophylaxis for cardiothoracic surgery in practice adheres to the Newcastle upon Tyne Hospitals Antibiotic Guidelines for Prophylaxis in Cardiothoracic Surgery and to establish whether the current trust guidance is fit for purpose.

The data collected was evaluated against the following standards:
1) Antibiotic choice used as prophylaxis, including whether it is prescribed in accordance with the guidelines in terms of weight band (and if between 100-120kg, what dose of antimicrobial was used) and penicillin allergy and MRSA status
2) Whether an oral pre-dose was given, drug name and dose as well as the timing of the administration
3) Post-surgery doses of antibiotics (if applicable) – including drug choice, route duration and timing of the doses

Method:
Data was collected from a total of 64 cardiothoracic surgery between 26/10/2015 and 31/12/2015 and fell under the hospital guidance criteria for antibiotic prophylaxis. Patients who did not fit the criteria were excluded from the study. This data was collected using patient surgical anaesthetic charts and e-record (Newcastle upon Tyne Hospitals electronic prescribing record).
Results:
Appropriate induction doses were given 70.3% of the time, whilst an oral pre-dose was given on 26.6% of occasions, appropriate post-surgery prophylaxis was given on 84.4% of surgeries. MRSA positive patients had been prescribed prophylactic IV antibiotics at higher dosing than their weight band and were not given an IV dose 12 hours later. Of the 7 cardiac surgery patients in the 100-120kg weight band, only one patient was dosed in the >120kg weight band. The remaining patients had been dosed according to the 80-120kg doses. 14 patients in total were administered oral pre-doses, all of which were cardiac surgery patients.

Conclusion:
Following this, a number of recommendations were suggested, including changes in guidance to reflect practice in weight based dosing for cardiac surgery patients between 100-120kg. A review of teicoplanin dosing should be considered with a view to re-evaluate current guidance. Additionally, the unnecessary practice of oral pre-dosing should continue to be discouraged.

References:

D. Prescribing of ivacaftor for cystic fibrosis in accordance with the clinical commissioning policy
Sian Farrell, University Hospitals Bristol, Bristol

Background
Ivacaftor, approved by the US Food and Drug Administration in 2012, is a treatment used in cystic fibrosis (CF) that targets the underlying cause of the disease as opposed to only treating the symptoms. Ivacaftor, being a high cost drug, is funded by NHS England only if the criteria set out in the clinical commissioning policy is followed. This audit investigates to what extent the clinical commissioning statement is adhered to when ivacaftor is prescribed at University Hospitals Bristol.

Objective and Standards
Objective: To ensure that prescribing of ivacaftor is in adherence to national guidance outlined in the Clinical Commissioning Policy: Ivacaftor for Cystic Fibrosis.

Standards: 1) 100% of ivacaftor prescriptions will be for patients who i) are 6 years of age or older and ii) have the G551D mutation, 2) 100% of patients will have received a baseline sweat chloride or lung function test within 6 months of commencing treatment, 3) 100% of patients will receive a follow up sweat chloride/lung function test at i) the next routine appointment, ii) 6 months after starting therapy, iii) annually thereafter to assess response to treatment and iv) 100% of patients who do not mount an adequate response will have treatment discontinued.

Method
This retrospective study investigated the prescribing of ivacaftor for cystic fibrosis patients during March 2012-January 2016. This study did not require ethics approval. A list of all patients prescribed ivacaftor was obtained using the Cystic Fibrosis Database (CF Database) and JAC, pharmacy medicines management software. The CF database and medical notes provided patient age, mutation type and start dates of ivacaftor treatment.

Results
A total of 14 patients were prescribed ivacaftor after March 2012. Standards 1(i), 1(ii) and 2 both demonstrated 100% compliance. Standard 3 appeared more difficult to comply with as parts 3(i), 3(ii) and 3(iii) were met at 92.3%, 84.6% and 15.4% respectively. Standard 4 was also met at 100%.

Discussion and Conclusions
The results have highlighted the difficulty with carrying out sweat chloride test reviews, especially annually. Failing to carry out these sweat tests means that a response to ivacaftor treatment and patient compliance with treatment cannot be confirmed. As a result this runs the risk of inadvertently contributing to financial pressure on then NHS and wasting resources at a significant level. Revision of ivacaftor management at University Hospitals Bristol is warranted in order to promote adherence to the clinical commissioning policy.

References

E. Denosumab for fracture prevention: a snapshot of compliance with Buckinghamshire Treatment Guidelines
Sabiehah, Latif, Buckinghamshire Healthcare Trust, Buckinghamshire

Background
Denosumab has been the subject of several Medicines and Healthcare Products Regulatory Agency (MHRA) alerts due to its risk of:
- Atypical femoral fractures[1]
- Osteonecrosis of the jaw
- Hypocalcaemia

To ensure that patients are aware of these risks, the MHRA requires all patients to receive a Patient Information Leaflet (PIL).

The local response to the MHRA advice has been to produce a local:
- Shared Care Protocol (SCP) which highlights the actions to be taken by healthcare professionals and patients to minimise the risks of denosumab treatment
• Pre-administration checklist for nurses to confirm that all required safety actions have been completed. This is included in the SCP as an appendix
• Denosumab Pil which is linked to the SCP. This should be given to each patient before starting denosumab treatment

Objectives
To measure documented compliance with key requirements of denosumab prescribing, administration and monitoring as defined in the SCP. These include documented evidence in clinical records to confirm that:

1. Denosumab is prescribed in accordance with The National Institute for Health and Care Excellence (NICE) place in therapy (100%)
2. Pre-assessment checks by the specialist prior to commencement of denosumab are undertaken (100%)
3. Pre-administration checks by the nurse prior to denosumab administration are undertaken (100%)
4. Patient information is provided to patients before initiation of treatment by the specialist (100%)
5. The shared care agreement form is completed by the specialist and GP and documented in the notes (100%)

Method
A retrospective audit of 66 patients who had received a denosumab injection during the period 04/10/14 to 31/03/15 at the Trust. A data collection pro forma was developed, piloted, amended and then used to collect the data in November 2015. Patients were identified using JAC dispensing records for the time period specified and their medical records and blood results were accessed using Evolve and Review software. This study did not require ethical approval.

Results
• The place in therapy of denosumab was correct in 55% of patients
• The pre-assessment checks were only being undertaken in 65% of patients
• The pre-administration checklist was completed in 15% of patients
• Only 38% of patients received verbal and/or written counselling before starting Denosumab
• The signed shared care agreement is in place at the correct time for only 11% of patients

Conclusions
The MHRA has published advice on the risks and precautions for the use of denosumab. A comprehensive local SCP has been produced with the aim of minimising these risks. This audit found that documented evidence of implementing this advice is lacking. Further efforts are needed to promote and ensure wider implementation of the SCP.

References

Background
The advent of oral antiviral agents has provided a potential cure for Hepatitis C (HCV). However, these agents are implicated in a range of drug-drug interactions (DDIs) which if not managed correctly, can lead to adverse events or treatment failure. Thus, to ensure safe and effective treatment of HCV, specialist clinical pharmacists at the Royal Free Hospital (RFH) participate in multidisciplinary team (MDT) meetings, and ensure appropriate use of commissioned regimens. Additionally, the pharmacy clinical screening procedure (CSP) requires pharmacists check for potential DDIs before patients commence therapy. An audit was therefore conducted to assess adherence to the CSP in patients who started and completed HCV treatment between June and December 2015.

Objectives:
The primary objectives were to determine:
• The proportion of patients that had a drug history taken.
• The total number of potential DDIs identified.
• If a Clinical Nurse Specialist (CNS)/Consultant was notified of the DDI(s) and the required intervention(s).

 Standards according to the CSP were as follows:
• 100% of patients have drug history taken
• 100% of patients taking concomitant medications have DDIs checked before initiating therapy
• 100% of identified potential DDIs and the required intervention(s) are communicated to CNS/Consultant.

Method
Individual patient record sheets completed in preparation for MDT meetings during the specified audit period were reviewed for documented drug history, DDIs, person notified of drug interaction(s), and required intervention(s). Findings were entered into a Microsoft Access database. Queries were designed to extract information from the database and then exported into Excel spreadsheets for analysis. This study did not require ethics approval.

Results
94 patients were identified for the audit. 100% of patients had drug histories taken. 84 (89%) patients had concomitant medication and 100% of these patients had DDIs checked prior to starting therapy. 74 DDIs were identified and all DDIs and appropriate intervention(s) were discussed with the applicable CNS/Consultant. A total of 379 drugs were reviewed averaging 4 drugs per patient. 51% (n=48) of all patients reviewed had a potential DDI identified.

Conclusions
All standards were met suggesting that the CSP is being followed. More than half of the patients reviewed in this audit were at risk of a DDI. This finding confirms the value of the CSP and the role of pharmacists in reducing the risk of adverse events and treatment failure in HCV patients. However,
an opportunity for increased pharmacist involvement is in obtaining drug histories directly from patients in clinic. Currently, this is done by a CNS and by using summary care records. An area for future audit would be to review whether interventions made to prevent DDIs (e.g. withholding drug) are reversed after completing treatment.

References

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G. Evaluating Pharmacist Interventions in Community-Acquired Acute Kidney Injury Emergency Admissions to Salford Royal Foundation Trust
Amelia Reed, Elizabeth Lamerton, Salford Royal NHS Foundation Trust, Salford

This study did not require ethics approval

Background
NHS England recognises AKI as a patient safety priority. AKI is associated with one in five emergency admissions and 100,000 deaths in secondary care per annum - over 60% of AKI starts in the community[1,2,3].

NHS England’s AKI programme “Think Kidneys” encourages healthcare professionals to advise patients to stop certain medications with nephrotoxic potential during acute illness - commonly referred to as ‘Sick Day Guidance’[2,3]. Patients admitted to SRFT’s Emergency Village with community-acquired AKI have their medicines reviewed by a pharmacist. This study evaluates the scale and impact of pharmacist interventions and identifies whether patients admitted with AKI have previously been advised on sick day guidance.

Aim:
Evaluate the role of secondary care pharmacists in managing community-acquired AKI and investigate the dissemination of sick day guidance advice.

Objectives:
- Identify the number, nature and timing of recommendations made via the AKI Pharmacy Review document, assessing the proportion of pharmacist recommendations implemented by the medical team and review of patients’ AKI status during hospital admission
- Assess the number of patients advised about sick day guidance in the community

Methods
Data was collected from 50 patients admitted to SRFT as emergency admissions over a four-week period in 2016. Pre-admission medications were screened and split into five categories considered to have nephrotoxic potential or pose further risk to patients in AKI[2,3]: ‘ACE inhibitors’, ‘ARBs’, ‘NSAIDs’, ‘diuretics’ and ‘metformin’. Electronic prescribing records were used to determine whether prescribing decisions were made before or after the Pharmacist AKI review, therefore potentially affecting the medical team’s prescribing decisions. Patients taking these medicines were interviewed on their awareness of sick day guidance.

Results
Of 46 patients eligible for an AKI review, 35(76%) occurred within 24 hours and 29(63%) were taking at least one medication from one of the five categories.

- Dose adjusting or withholding was recommended for 38(80.9%) nephrotoxic medicines. Pharmacist recommendations were adhered to for 36 medicines (95%). Of patients who had a pharmacist AKI review, 34(77.3%) had no worsening of AKI.
- None of the 28 patients suitable for interview recalled sick day guidance or having been counselled that certain medications could affect their kidneys. Therefore, no patient had followed the guidance to stop medicines prior to admission.

Conclusions
Pharmacists were actively involved in the medication review of AKI patients, providing prompt reviews of the patients’ medicines and recommendations for protecting renal function. Pharmacists have an important role in the optimisation of potentially nephrotoxic medicines and can contribute positively towards optimal medical management of AKI.

This study suggests that the dissemination of sick day guidance to at-risk patients has not been maximally implemented thus far - possibly indicating that healthcare professionals are cautious about advising a drug holiday from such significant medicines. This highlights the need for further public awareness campaigns and involvement of both primary and secondary care colleagues.

References

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H. An audit of pharmacist's documentation of administration instructions of medicines via enteral feeding tubes
Clara Silcock, Trainee Specialist Pharmacist, Audit Supervisor: Sarah Zeraschi, Consultant Nutrition Pharmacist, Leeds Teaching Hospitals Trust

Introduction:
The inaccurate administration of medicines via enteral feeds cannot only pose a problem with regards to the efficacy of a drug but could also cause legal problems. Many health professionals are not fully aware of the extent of the potential problems therefore putting both the safety of their patient and their professionalism at risk. This audit will compare the current practice at Leeds Teaching Hospitals (LTHT) with the standard that 100% of patients with enteral feeding tubes have medication administration instructions that meet the guidelines recommended by LTHT and in either the NEWT guidelines or in The Handbook of Drug Administration via Enteral Feeding Tubes.

Aim:
To determine whether the documentation given by pharmacists for administration instructions of medicines via enteral feeding tubes is in-line with
NEWT and The Handbook of Drug Administration via Enteral Feeding Tubes.

Objectives:
- Assess patients drug charts to determine whether pharmacists have accurately documented correct instructions for medicines that are being delivered by enteral feeding tubes
- Identify common mistakes from prescribers and pharmacists when prescribing and annotating medications that require administration via an enteral feeding tube.
- Provide a recommendation to aid prescribers and pharmacists to determine the most appropriate drug formulation and provide accurate documentation on the patient’s drug chart to aid the administration.

Method:
Data was collected using a data collection form from any adult patient who was being enterally fed and required medicines to be administered via their enteral feed on the Neurology wards at Leeds Teaching Hospital Trust. I personally filled out the data collection form depending on what was documented by the pharmacist on each patient’s chart. This study did not require ethics approval.

Results:
102 drug entries were audited which included 51 different drugs. Combining results of both the NEWT guideline and The Handbook of Drug Administration via Enteral Feeding Tubes, gave the results that 84% of drugs had appropriate formulations prescribed to be administered via an enteral feed. Of the 84% of drugs, 43% had complete instructions documented by the pharmacist. This was determined by accepting instructions to be complete if they matched either NEWT or The Handbook of Drug Administration via Enteral Feeding Tubes.

Conclusion:
There is generally not enough documentation by pharmacists, on the patient’s drug charts who require medicines to be administered via their enteral feeding tubes to ensure the most appropriate administration technique is carried out.

References:
5. Enteral Tube Feeding Policy, Leeds Teaching Hospital Trust.