Identifying the underlying causes of PDRA
Comparing a pharmacist-led, IT-based intervention to reduce hazardous medicines management in primary care

Howard R (on behalf of the PINCER trial team), University of Reading

Prescribing errors in primary care have been found in 7.5% of prescriptions and contribute to preventable drug-related admissions to hospital (PDRA) which account for a median of 1.7% of admissions. Much work has been done on prescribing errors in secondary care, and pharmacist interventions are widely accepted. However, the role of pharmacists in primary care is less accepted, and less is known about the causes of errors in this setting. This paper describes a programme of work that has culminated in the development of a successful pharmacist-led, information technology (IT) based intervention to reduce hazardous medicines management in primary care.

AIM AND OBJECTIVES
The aim of this work was to develop an evidence base which would underpin development of an intervention to reduce hazardous medicines management in primary care. The development process followed MRC recommendations for developing and evaluating complex interventions. Specific objectives included:

- Identifying the underlying causes of PDRA
- Developing (and piloting) an intervention to identify the underlying causes of hazardous medicines management using the principles of root cause analysis
- Developing "information summaries" to underpin an educational outreach intervention to reduce ten types of hazardous medicines management
- Comparing a pharmacist-led, IT-based intervention to reduce the incidence of hazardous medicines management in primary care, with simple feedback (the PINCER trial)
- Describing the patient-specific interventions made by trial pharmacists

METHODS
Ethics approval was obtained for all studies where necessary. Prospective observational chart reviews of 4,093 hospital admissions, and systematic review of 17 published studies of hospital admissions identified the main underlying causes of PDRA. Qualitative interviews with patients, doctors and pharmacists relating to 18 cases of preventable hospital admission identified the main latent and environmental factors contributing to PDRA. These helped develop indicators of preventable drug-related morbidity (PDRM) which were piloted in eight general practices. The results of these electronic searches were fed back to practice staff in multidisciplinary meetings. Three tools of root cause analysis (brainstorming to generate underlying causes of problems and potential solutions, the five whys to identify root causes of problems, and nominal group technique to prioritise ideas) were used in these meetings to help practices develop solutions to the medicines management problems identified.

Ten PDRM indicators were developed based on these earlier studies and problems highlighted by the Medicines and Healthcare Regulatory Agency and National Patient Safety Agency. Evidence based summaries describing the medicines management problems, incidence of harm to patients and potential solutions were developed following brief literature reviews. These summaries were used to underpin the educational outreach element of the PINCER trial.

The PINCER trial was a cluster randomised controlled trial which demonstrated that a pharmacist-led IT-based intervention significantly reduced the proportion of patients potentially at risk from hazardous medicines management compared with simple feedback. The indicators were used to search electronic patient records in 72 English general practices. Search results were communicated to practices by simple feedback (control group) or by a pharmacist in a multidisciplinary meeting using the principles of root cause analysis and educational outreach (intervention arm). The intervention arm also received up to 12 weeks of pharmacist support to implement changes to practice.

Summary data describing patient-specific interventions recommended by the trial pharmacists were analysed using descriptive statistics to help identify the actions which made the intervention successful.

RESULTS
The observational study and systematic review found that antiplatelets, non-steroidal anti-inflammatory drugs (NSAIDs), anticoagulants and beta-blockers were the main drug causes of PDRA. In addition, these studies found that prescribing problems and monitoring problems contributed to hospital admission. The qualitative interview study found that communication problems and knowledge gaps about drugs and patient histories were the main underlying causes of PDRA. Pilot studies demonstrated that the computer-based searches were able to identify patients at risk of hazardous medicines management, and the root cause analysis tools helped practices identify problems. Pilot work also demonstrated that practices needed assistance to implement sustained changes to medicines management processes. The PINCER trial demonstrated that patients in the pharmacist intervention arm were significantly less likely to have a prescribing problem (OR 0.71, 95%CI 0.59–0.86) or a monitoring problem (OR 0.56, 95%CI 0.44–0.70). These differences remained significant at 12 months for all except the NSAID indicator. Pharmacists recommended 2,118 actions in 75% (1,518/2,038) of cases of hazardous medicines management identified by searches, 66% (1,388) of recommendations were accepted by general practices.
DISCUSSION AND CONCLUSION
A programme undertaken by a multidisciplinary team of researchers has culminated in the development of a successful pharmacist-led intervention to reduce hazardous medicines management in primary care. We believe that the intervention could be implemented using existing general practice pharmacists and extrapolated to additional indicators for hazardous medicines management.

REFERENCES

POSTER AWARD
Introducing prescribing standards to improve medicines safety to a hospital in rural Uganda
Oates K, Toop H, Crawley JE, Department of Pharmacy, Countess of Chester Hospital NHS Foundation Trust

In 2008 the Countess of Chester Hospital NHS Foundation Trust (COCH) formed an institutional link with Kisiizi Hospital, a rural non-government hospital in the south-west of Uganda, with the aim of improving patient care through education and training. Medicines management and reducing medicines-related risk was high on the agenda, a remit which was strengthened following the commencement of the African Partnership for Patient Safety (APPS) project which also has a strong emphasis on medicines safety.

In conjunction with the newly formed Kisiizi Drug and Therapeutics Committee, the COCH Pharmacy project team set about introducing the concept of medicines safety, which led to a general review of prescribing and prescription writing. Local prescribing standards were developed along with the Kisiizi D&T Committee during a visit in April 2010 following an initial overall review of prescribing within the hospital and discussion with the Kisiizi senior clinicians. The standards are based on WHO guidelines, Uganda National Clinical Guidelines and COCH Medicines Policy, as well as incorporating some elements of existing local practice. The standards were ratified by the D&T Committee and communicated via a whole hospital meeting; copies of the standards were displayed prominently in ward areas and it was expected that all employed and visiting clinical staff should follow them when prescribing medicines for both in- and out-patients. The reporting of non-adherence to the standards was also actively encouraged by the Chair of the D&T Committee.

During a further visit in October 2010 an audit was carried out to assess adherence to the standards.

OBJECTIVE
To monitor adherence to the recently introduced Kisiizi Hospital Prescribing Standards on the inpatient wards.

METHODS
All in-prescriptions and prescribed items were assessed for compliance against each of the Standards. Data were collected from a total of six wards over a two-day period. A total of 109 prescriptions from six inpatient wards were audited with a total of 306 items prescribed.

RESULTS
The results are set out in Table 1.

Prescribing overall was of a high standard, with the majority of items being dated and having a dose, route and frequency documented. Of the 23 “prn” drugs prescribed, 19 (83%) had a maximum dose documented and only 10 (less than 3%) of the total items had been amended rather than being rewritten completely. Of the 306 items prescribed 104 (34%) were printed and only 93 (30%) were signed. While these figures may appear low, these are new standards for Kisiizi, introduced to reflect the WHO and Uganda National Clinical Guideline standards for good prescribing. The signing of inpatient prescriptions both when starting and discontinuing treatment is a new concept for Kisiizi staff and is not helped by the design of the prescription chart, which has no room for a signature. This is an area for future development where it is also hoped to incorporate spaces for documenting allergy status and reasons for missed doses.

Abbreviations were still being used by prescribers across all wards audited. However, the 225 (74%) items written with the full generic name does seem anecdotally at least to represent some improvement over observations from the informal prescribing assessment in May 2010 prior to the introduction of the standards. The most commonly abbreviated drugs are generally found to be benzylpenicillin (Xpen), quinine (QNN), aspirin (ASA), mixture of magnesium trisilicate (MMT). Common brand names prescribed are Plasil (metoclopramide) and Panadol (paracetamol).

The introduction of antibiotics and antimalarial course lengths and review dates is in line with COCH antibiotic prescribing guidelines and, as expected, adherence to this new standard is relatively low (15% and 43% respectively). As well as promoting responsible antimicrobial use, the stop/review date is also important from a financial point of view where patients pay for each dose of a drug received.

DISCUSSION
The concept of medication safety is still in its infancy in Uganda but it is hoped that the introduction of the Kisiizi Hospital Prescribing Standards, as well as providing guidance for prescribers, will provide the basis for other staff to openly challenge non-compliance, to report poor prescribing and thereby reduce medicines-related risk. There is still a number of cultural differences to overcome and, just as in the UK, there is a need to empower staff to feel confident about challenging prescribers.

The results have already been shared with Kisiizi D&T Committee and the plan was to reaudit during the next COCH visit in May 2011 with a view to encouraging Kisiizi to carry out their own audits in the future.

REFERENCES
2 Ministry of Health. Uganda Clinical Guidelines. 2009. (draft). (Personal communication)

| Table 1: Number of items prescribed according to Kisiizi Hospital Prescribing Standards |
|---------------------------------|-----------------|
| Standard | n=306 |
| Frequency documented | 293 (96%) |
| Prescription dated | 283 (92%) |
| Dose documented | 271 (89%) |
| Number of “prns” with maximum daily dose documented | 19/23 (83%) |
| Route documented | 225 (74%) |
| Generic name used (no abbreviations/brand names) | 225 (74%) |
| Antimalarial with course length/review date | 47/43 |
| Drug name printed | 104 (34%) |
| Prescription signed | 93 (30%) |
| Discontinued drugs signed | 58 (26%) |
| Antibiotic prescriptions with course length/review date | 11/74 (15%) |
| Total number of amendments on chart | 10 (3%) |
| Number of items with unnecessary decimals | 0 (0%) |
| Number with micrograms in full | n/a (n/a) |

United Kingdom Clinical Pharmacy Association and Guild of Healthcare Pharmacists joint conference 2011
Audit to evaluate compliance to the NWLH Trust guidelines for the empiric therapy of infection in adults

Patel A, Jethwa S, Sanghera I
North West London Hospital NHS Trust

Empirical antimicrobial therapy involves the initiation of antibiotics prior to determination of a firm diagnosis. Prescribing is usually carried out with a broad spectrum antibiotic for a short period of time while the specific micro-organism is determined. Once the liable micro-organism is identified, treatment should be downgraded to a more suitable narrow spectrum agent. With growing national and international concern about the increasing resistance of micro-organisms to antimicrobial agents, there is now increased recognition of the need for more concerted action to prevent, delay and control the problem of antimicrobial resistance. Prolonged treatment of broad-spectrum antibiotics leads to increasing emergence of resistant organisms such as Clostridium difficile and meticillin-resistant Staphylococcus aureus (MRSA) which can limit treatment options available and increase the length of hospital stay.

STANDARDS
100% compliance with the NWLH Trust guidelines for empirical prescribing (unless otherwise advised by a consultant microbiologist)

OBJECTIVES
- To evaluate the compliance of empirical anti-infective treatment against Trust guidelines
- To identify the percentage of patients across the trust who are receiving anti-infective treatment at any one time and identify the number being treated empirically.
- To identify the percentage of patients who have the length of treatment documented on their charts.
- To identify the most commonly used anti-infective within the trust

METHOD
The audit was carried out across the trust at Northwick Park Hospital and Central Middlesex Hospital on Wednesday 13 October 2010. A point prevalence study design was used. All participating ward pharmacists at Central Middlesex Hospital (CMH) and Northwick Park Hospital (NPH) were emailed the final data collection form with instructions on how to complete the form. In addition a guideline sheet was prepared outlining the aim and objectives of the audit. This was emailed and handed out to all participating pharmacists. Daily briefing sessions were held regarding the audit and data collection form and any questions pharmacists had about the data collection process or the audit were answered.

Patients were defined as compliant if they adhered to the guidelines for empiric therapy of infection in adults. If there were any differences that differed from the guidelines due to advice from microbiology then these were also defined as compliant. Pharmacists were told who the principal investigator (PI) was and who they could ask for further information. The data collections forms were returned to the PI and were then entered into customised database created with Microsoft Access.

RESULTS
1 Forty-seven (62%) patients out of a total of 76 patients receiving empiric treatment were compliant to trust guidelines in terms of drug/dose/route/frequency at NPH. At CMH 15 (71%) patients out of a total of 21 patients were compliant to trust guidelines.
2 At NPH 121 (24%) out of a total of 497 patients were prescribed 183 anti-infectives at NPH. At CMH 30 (25%) out of a total of 120 patients were prescribed 45 anti-infectives. At NPH 67% of the patients receiving anti-infective treatment were being treated empirically. At CMH 72% of the patients receiving anti-infective treatment were being treated empirically.
3 At NPH 15 (20%) out of 76 patients receiving empiric therapy had the length of treatment documented on their drug charts. At CMH five (24%) out of 21 patients receiving empiric therapy had the length of treatment documented on their drug charts.
4 A total of 152 patients were prescribed anti-infectives across the trust, the most common being co-amoxiclav, with a prevalence of 35%.

DISCUSSION
The audit showed 38% of those receiving empirical treatment did not comply with the empirical prescribing guidelines at NPH and 29% at CMH. This represents an issue for concern as an increase in non-compliance can lead to a number of problems for the trust such as increase in local resistance patterns and increased costs in prescribing.

A method of increasing compliance in the trust is to highlight the issue to ward pharmacists who have the ability to play an important role in ensuring prescribers are compliant. Lunchtime sessions could be set up with ward pharmacists educating them about the importance of compliance and how to carry out interventions when non-compliance to the Trust guidelines is noted.

The use of broad-spectrum antimicrobial agents is a major factor in inducing hospital bugs such as C difficile. Therefore where cephalosporins, quinolones and broad-spectrum penicillins are used for empirical treatment it is imperative for the prescriber to specify the length of treatment on the drug chart. It may be more ideal for a review date to be documented rather duration in most cases. Greater emphasis could be placed on ward pharmacists to highlight the importance of documenting the length of treatment or review dates of anti-infectives.

Clarke Ward, an infectious disease ward, had 100% compliance to the empiric prescribing guideline and represents excellent prescribing standards. Ideally the prescribing practices of Clarke Ward should be replicated throughout the trust. It would be helpful for the physicians and pharmacists involved in Clarke Ward to help increase the awareness of compliance to the guidelines to the other wards. Regular monitoring of compliance and feedback of results to relevant parties may facilitate the drive for better compliance.

REFERENCES
Detailed nutrient intake and growth in parenterally fed infants on a Neonatal Intensive Care Unit

Heller A, Hartigan D and Puntis J
Neonatal Intensive Care Unit, Leeds Teaching Hospitals

In 1968 a landmark case report was written describing how parenteral nutrition (PN) can be used as a life-saving intervention in children. Early nutritional intervention is key to the long term survival and prognosis of premature infants. Preterm infants are unlikely to be able to tolerate enteral feeds, therefore it is important for them to start PN on day 1 of life.

The three main nutritional components of PN are carbohydrate (CHO) given as glucose, fats (Intralipid or Clinoleic) and amino acids (given as a nitrogen solute ion Vaminolact). It also contains essential minerals, vitamins and trace elements. Preterm babies are often growth retarded and so the volume of fluid they can receive is limited.

OBJECTIVES

- To audit the daily intake of nutrition (both enteral and parenteral) in premature infants, observing the PN prescribing protocol for our neonatal unit and the actual volumes of PN received.
- To compared this intake to the recommendations of the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) guidelines.

METHOD

Data were collected by one of the authors (AH) over a period of six months and analysed using Excel. Daily accounts of nutritional intake of infants born at 33 weeks gestation and weighing less than 1.5 kg were documented; including prescribed amounts of lipid and aqueous phases of PN. We recorded reasons for deviations from the guidelines. The amount of PN prescribed was compared to what the baby actually received. We documented on which day of life PN was initiated and also when enteral feeding began. Calories received from both enteral and parenteral nutrition were recorded. Also recorded were any additional calories the baby received in the form of clear fluids (ie, glucose 5% and/or 10%).

RESULTS

Of the 10 infants audited, nine started PN on day 1 of life. The average weight gain of the 10 infants was 0.577kg over the PN period. The starting volume for PN ranged from 55 to 120mL/24 hours. Table 1 shows that none of the infants received the full volume of prescribed Vaminolact for the full duration of their time on PN, however three did receive the complete volume of the prescribed fats. Of the three main nutritional components nitrogen was prescribed most closely to the ESPGHAN guidelines and the neonatal unit’s PN protocol and carbohydrate the least.

The time taken to starting enteral feeds ranged from day 1 of life to day 19 of life. Seven of the 10 infants started enteral feeds the first 3 days of life. The average volume of enteral feeds tolerated in 24 hours before PN was stopped was 95mL/24 hours. The most common feed at initiation of enteral feeding was expressed breast milk (EBM) given to nine infants. The remaining infant was given NutripreM1 (feeds initiated on day 19 of life). The average total amount of kcal received by the infants on day 1 of PN was 40.7kcal/kg and on the last day of PN was over 100kcal/kg in eight of the infants.

One of the infants had care withdrawn after 15 days of life so the data is not applicable with regards to enteral feeding and weight.

DISCUSSION

Leeds Teaching Hospitals currently have a PN pharmacist working seven days a week prescribing for the infants on PN. There are plans to introduce standard bags for infants born over the weekend. The advantages to this include improved capacity management for the pharmacy aseptic unit at the weekend, safer more efficient use of the skilled workforce and an ease of access to PN. However, from the results it can be seen that the requirements for each infant varies dramatically especially when looking at volume allowed for PN. The current system allows full nutritional requirements in a smaller volume. Each bag is tailor made and taken into consideration the infant’s calorific requirements and biochemical needs. This may create more work for the out-of-hours pharmacist if "designer fluids” (bespoke maintenance fluids made in the pharmacy aseptic department) were required.

The main reason we found for infants not receiving the amount of PN prescribed was the addition of extra fluids (either blood products or IV drug infusion). In order to ensure the infants reached the correct fluid allowance the rate of infusion on the aqueous phase was decreased. This was done at the discretion of the medical and nursing staff and perhaps is an area where clear guidelines are needed. The rate of lipid was not adjusted and this is reflected in the results.

According to our PN prescribing protocol, before fat can be increased to 4g/kg/day triglyceride levels need to be checked. The allocated day for this is Thursdays; therefore an infant may remain on 3.5g/kg/day of fat for 1–6 days before moving onto 4g/kg/day, another reason for guidelines not being followed. Towards the end of the PN course the guideline amounts were not received due to an increase in enteral feeds resulting in less volume for PN.

REFERENCES


Auditing clinical pharmacists’ interventions at The Heart Hospital (UCH)

Man A, Wilton H
University College London Hospital Foundation Trust, London, UK

Pharmacists have an important role to play in preventing prescribing errors and ensuring that medicines are prescribed appropriately and safely. Ongoing work has shown that pharmacists are a valuable part of the multidisciplinary team, carrying out interventions that have a positive impact to patient care.1,2 This audit focuses on the clinical interventions made by pharmacists at ward level at a tertiary cardiac centre.

At ward level, pharmacists are involved in optimising pharmaceutical care tailored to patient’s needs, and it is this aspect that pharmacists aim to allocate most ward time towards. Interventions in response to incorrect/inappropriate prescriptions should not be seen as an unexpected occurrence, although in practice, much of pharmacists’ activities relate to such events.

<table>
<thead>
<tr>
<th>Baby</th>
<th>Gestation</th>
<th>Days on PN</th>
<th>Percentage of prescribed solute baby received</th>
<th>Percentage of prescribed fat baby received</th>
<th>Percentage N prescribed per ESPGHAN</th>
<th>Percentage CHO prescribed per ESPGHAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31+6</td>
<td>5</td>
<td>20</td>
<td>100</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>25+3</td>
<td>29</td>
<td>24</td>
<td>90</td>
<td>41</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>23+2</td>
<td>11</td>
<td>46</td>
<td>91</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>15</td>
<td>27</td>
<td>93</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>12</td>
<td>8</td>
<td>75</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>6</td>
<td>26+6</td>
<td>10</td>
<td>20</td>
<td>80</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td>7</td>
<td>57</td>
<td>100</td>
<td>86</td>
<td>71</td>
</tr>
<tr>
<td>8</td>
<td>27</td>
<td>18</td>
<td>50</td>
<td>78</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>9</td>
<td>25+3</td>
<td>13</td>
<td>15</td>
<td>100</td>
<td>69</td>
<td>46</td>
</tr>
<tr>
<td>10</td>
<td>32</td>
<td>6</td>
<td>50</td>
<td>67</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>Median</td>
<td>12</td>
<td>26%</td>
<td>91%</td>
<td>62%</td>
<td>51%</td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Frequency of interventions carried out between November 2010 and January 2011

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Frequency (number (percentage))</th>
<th>Nov 2010</th>
<th>Dec 2010</th>
<th>Jan 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticoagulation</td>
<td>36 (15.5)</td>
<td>11 (9.7)</td>
<td>35 (22.3)</td>
<td></td>
</tr>
<tr>
<td>Inaccuracy in TTA/drug history transcribing</td>
<td>18 (7.7)</td>
<td>22 (19.5)</td>
<td>23 (14.6)</td>
<td></td>
</tr>
<tr>
<td>Drug Interaction</td>
<td>20 (8.6)</td>
<td>12 (10.6)</td>
<td>22 (14.0)</td>
<td></td>
</tr>
<tr>
<td>Unnecessary prolong treatment</td>
<td>17 (7.3)</td>
<td>22 (19.5)</td>
<td>19 (12.1)</td>
<td></td>
</tr>
<tr>
<td>Dose correction – renal / hepatic impairment</td>
<td>17 (7.3)</td>
<td>1 (0.9)</td>
<td>15 (9.6)</td>
<td></td>
</tr>
<tr>
<td>Therapy optimisation</td>
<td>42 (18)</td>
<td>16 (14.2)</td>
<td>12 (7.6)</td>
<td></td>
</tr>
<tr>
<td>Allergy information omitted/incorrect</td>
<td>22 (9.4)</td>
<td>11 (9.7)</td>
<td>7 (4.5)</td>
<td></td>
</tr>
<tr>
<td>Ambiguous/incorrect dosing</td>
<td>36 (15.5)</td>
<td>6 (5.3)</td>
<td>5 (3.2)</td>
<td></td>
</tr>
<tr>
<td>Antibiotic policy</td>
<td>5 (2.1)</td>
<td>4 (3.5)</td>
<td>4 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Pain control</td>
<td>6 (2.6)</td>
<td>3 (2.7)</td>
<td>4 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Therapeutic drug monitoring</td>
<td>0</td>
<td>0</td>
<td>4 (2.5)</td>
<td></td>
</tr>
<tr>
<td>IV to PO switch</td>
<td>2 (0.9)</td>
<td>1 (0.9)</td>
<td>3 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Legality of prescription</td>
<td>0</td>
<td>0</td>
<td>2 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Loading dose</td>
<td>0</td>
<td>0</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Duplication</td>
<td>9 (3.9)</td>
<td>3 (2.7)</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Adverse reaction</td>
<td>0</td>
<td>1 (0.9)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Formulary/cost issue</td>
<td>3 (1.3)</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total number of interventions</td>
<td>233</td>
<td>113</td>
<td>157</td>
<td></td>
</tr>
</tbody>
</table>

OBJECTIVE
- To audit the number and types of interventions made by pharmacists at ward level on a monthly basis (between November 2010 and January 2011).

STANDARD
- All inpatient drug charts are seen and reviewed by a pharmacist on a daily basis (weekdays).

METHOD
Six wards (ICU, HDU, CCU, short stay, two cardiothoracic) were included in this audit (total 96 beds). Four pharmacists were involved in data collection. Inpatient lists were obtained each morning and all drug charts were seen on a daily basis (weekday). During the audit period (November 2010 to January 2011), pharmacists logged all interventions made at ward level onto a shared database. The interventions were divided into categories (as shown in Table 1). The results were analysed at the end of the month.

In this audit, an intervention is defined as a process or recommendation made by a pharmacist in response to an inappropriate prescription, which is accepted/agreed by the relevant clinician, and subsequently resulted in a change in prescription.

RESULTS
The results are set out in Table 1.

DISCUSSION
As shown in Table 1, in November 2010 the most recorded interventions were related to therapy optimisation (18%). In December 2010 the most recorded interventions were “inaccuracies in TTA/drug history transcribing” and “unnecessary prolong treatment” (19.5%). In January 2011, anticoagulation was the main area that pharmacist were required to make clinical interventions (22.3%).

The interventions made by each pharmacist were similar in number, despite the difference in allocated time for ward activities amongst the team, i.e. junior pharmacists are generally expected to spend more time on wards than senior colleagues. It should be noted that junior pharmacist interventions were in most cases fairly straightforward, whereas those carried out by senior pharmacists involved more complex cases.

The result from this audit allows us to tackle areas of practice that are not being performed to their full potential. One recommendation is that outpatient prescriptions are audited for interventions carried out in the outpatient setting.

Audit of the prescribing of quetiapine for the behavioural symptoms of dementia

Bennett S*, Power B
Wirral University Teaching Hospital NHS Foundation Trust, Wirral (*now at Pilgrim Hospital, Boston)

In recent years the prescribing of atypical antipsychotics such as quetiapine for the behavioural symptoms of dementia has increased. However, there have been clinical concerns about using atypical antipsychotics in this patient cohort with some of these agents being linked to an increased risk of stroke. There were also reports that these agents were being overprescribed. This has led to the publication of the All Party Parliamentary Report that recommended that antipsychotics should only be used when all other options for behavioural management have been exhausted and that they should be used for the shortest time possible at the lowest effective dose.

Although the trust lacked clear guidance regarding quetiapine prescribing, the audit standards were that it should only be initiated by either a consultant physician in elderly care or psychiatrist for behavioural symptoms of dementia such as aggression and agitation at a dose of up to 25mg daily. The efficacy and dose of quetiapine should be reviewed regularly and requirements post-discharge should be explained in the discharge letter. And for those patients admitted on quetiapine it was expected that the indication for the drug and the dose would be reviewed and any changes explained to the GP at discharge.

OBJECTIVES
1. To identify where quetiapine treatment was initiated and if hospital initiated to identify who recommended it.
2. To identify the indications for quetiapine and the doses used.
3. To assess whether the effectiveness of therapy was monitored in hospital.
4. To investigate for hospital initiated patients whether the rationale for initiation and suggestion for review was communicated to the general practitioner (GP) in the discharge letter.

METHODS
All patients prescribed quetiapine over a one-month period were identified using the trust’s electronic prescribing system. Their electronic records and case notes were reviewed to identify the indication for quetiapine, where it was initiated and by whom, details of any dose changes and evidence of monitoring of effectiveness. Patients were excluded if the quetiapine was...

REFERENCES
being used for an indication other than the behavioural symptoms of dementia. After discharge it was recorded if quetiapine was prescribed on the take home prescription and discharge letters were reviewed to establish whether any information was communicated to the GP about the rationale for the drug or any monitoring required.

RESULTS

The audit identified 23 patients (none of whom were excluded) with an average age of 83 years. Quetiapine was initiated in 10 patients during their admission—in seven cases by a hospital consultant. There were 13 patients admitted to the hospital already prescribed quetiapine. Dementia (most commonly vascular dementia) was diagnosed in 18 patients. The symptoms associated with the behavioural problems of dementia were recorded for 17 patients. The symptoms were recorded for all hospital initiated patients and are shown in Table 1.

Quetiapine was newly started at a dose of 12.5mg daily for three patients and 25mg daily for seven others. For these patients there was documentation of monitoring or evidence of dose changes in nine patients. In two cases the quetiapine was then stopped during the inpatient stay. Quetiapine doses ranged from 25mg to 200mg daily for patients taking quetiapine prior to admission. In these patients there was evidence of dose changes in two cases with accompanying documentation in one case. In both these cases the quetiapine was stopped. There were 17 patients discharged on quetiapine of whom seven had been newly initiated in hospital. The rationale for commencing quetiapine was communicated to the GP in three cases and in one case where quetiapine had been prescribed but subsequently stopped this information was included in the discharge summary.

DISCUSSION

The audit confirmed that quetiapine is commonly used for the behavioural symptoms of dementia in secondary and primary care. The majority of new prescriptions for quetiapine were initiated by a hospital consultant. Dementia had been diagnosed in most patients newly commenced on quetiapine and relevant symptoms were noted for all such patients. The initial doses prescribed adhered to local formulary guidance and accepted prescribing practice. Judging the prescribing appropriateness is limited by the lack of well defined clinical guidance and that the study involved a retrospective records review based on documented evidence of diagnosis, symptoms and monitoring. Taking into account these limitations it is reasonable to conclude that the prescribing of an anti-psychotic was appropriate for the majority of hospital initiated patients.

The documented evidence of monitoring quetiapine was good for patients newly commenced on the drug but there was little evidence of the drug being reviewed in patients who were admitted on it. Communication to the GPs about the rationale for starting quetiapine occurred in half of the relevant cases and this needs to be improved.

This study confirmed that the use of quetiapine for the behavioural symptoms of dementia was appropriate in most cases but better local guidance for clinicians would be helpful. Clinical staff need to improve their monitoring of quetiapine both for new and existing patients and also need to ensure that GPs are made aware of the rationale for starting the drug in all cases as well as providing guidance on when it should be reviewed. The trust is now introducing guidelines to give clear directions to clinicians on how to diagnose and treat the behavioural symptoms of dementia.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggression</td>
<td>5</td>
</tr>
<tr>
<td>Agitation</td>
<td>7</td>
</tr>
<tr>
<td>Confusion</td>
<td>2</td>
</tr>
<tr>
<td>Psychotic Symptoms</td>
<td>1</td>
</tr>
</tbody>
</table>

* Note: Patients may have been recorded as having multiple symptoms

Audit of insulin administration in community settings

Livingstone C, Rogers T, Wolper S
Medicines Safety Division, East & South East England NHS Specialist Pharmacy Services

In England and Wales the National Patient Safety Agency (NPSA) receives a large number of incident reports concerning unsafe use of insulin, including wrong dose, wrong product and insulin omitted.1 Community nursing accounts for 8% of all reported medication incidents, and a number of incidents with insulin have resulted in serious patient harm.1 Insulin administration for patients unable to self-administer is a significant area of activity for community nursing teams. Staff administer insulin for patients in their own homes or residential care homes, and may also undertake blood glucose testing. Requirements in the recent NPSA Rapid Response Report “Safer administration of insulin” include ensuring that community staff always have supplies of insulin syringes and needles, and that abbreviations for the word “units” are never used.2

OBJECTIVES

- To audit the quality of documents authorising community nurses to administer insulin against the following standards: clear, correct full name of insulin preparation included; dose to be administered clearly stated with no abbreviation for the word “units”; form/device used to administer insulin clearly stated; signed by prescriber and dated.

- To quantify the use of different insulin administration devices by community nurse teams.

METHODS

Data collection forms were developed by the Medicines Safety Division of the East and South East England Specialist Pharmacy Services with subsequent specialist review and pilot by a community nursing team. Organisations within the geography were invited to participate via presentations and emails to established community health services pharmacy networks and leads. Community teams conducted the audit on any one day between 15 November and 15 December 2010. For each insulin patient visited on the audit day, the healthcare worker who administered insulin completed a one-page audit sheet, including information on the quality of documentation and the use of different insulin administration devices. Data were analysed using Microsoft Access 2003.

RESULTS

Nineteen NHS trusts participated in the audit. Data were collected for 622 patients requiring administration of insulin. Medicines administration authorisation documents largely included the correct full insulin name, with only 15/612 (2.5%) indicating that this was not present. However, the word “unit” was abbreviated on 97/618 (15.7%) occasions and on a further 24/621 (3.9%) occasions the dose was not clear. Comparative data on use of abbreviations for the word “unit” for 14 trusts reporting at least 20 patients are shown in Figure 1. The insulin administration device was often not stated (54.1%) and occasionally the records were not signed and dated by the prescriber (7.7%). Prescription details such as product names and doses were frequently transcribed onto medicines administration records by someone other than the prescriber (69.2%).

The types of insulin administration devices actually used were subdivided into: insulin syringes (258); prefilled disposable devices (eg Innolet, Solostar, FlexPen) (178); cartridges for use with insulin pens (60);
unspecified “pen” type device (52%); not reported/unclear (74%). Administration using insulin syringes varied considerably between trusts, from more than 80% of patients to less than 10%. 3.1% reported that insulin syringes and needles were not always available.

**DISCUSSION**

The use of abbreviations when prescribing insulin is a significant safety hazard for patients requiring insulin administration in the community. A large inpatient audit reported use of abbreviations for the word “unit” in 7.0% of patients, but the incidence in the community appears to be more than twice as high (15.7%). This audit was conducted less than a month before the NPSA Report on insulin safety was due for completion, so it seems unlikely that compliance would be achieved before the 16 December 2010 deadline. However, use of abbreviations clearly varied considerably between trusts with some reporting low use. An eight-fold variation in the use of insulin syringes was noted between different trusts. The plethora of different insulin administration devices, whilst supporting patient self-administration, can be problematic for non-specialist healthcare staff. In situations where patients do not self-administer, insulin syringes have been advocated as the preferred administration device as there is no additional training need and the risk of needle stick injury is less than with pen devices. This audit has demonstrated marked variation in the quality of insulin documentation and use of different administration devices in community settings. The data enable trusts to benchmark services, providing a driver to improve the quality of insulin prescribing and rationalise the use of administration devices.

Acknowledgement: This audit would not have been possible without the help and support of the Community Services Pharmacy Network and all the NHS Trusts involved.

**REFERENCES**


3 Livingstone C, Nichols J. Collaborative audit of pharmacy interventions which contribute to the safe use of insulin. UKCPA Autumn Symposium 2010 (in press).

**Three years of medicines reconciliation on an acute medical unit**

Betke CA, Webster R

Acute Medical Admissions Unit, Leeds Teaching Hospitals

In December 2007 the NPSA and NICE released a technical patient safety alert on medicines reconciliation (MR) for adult patients admitted to hospital. This highlighted the need for pharmacy input in to medicines reconciliation as soon as possible after admission. A trust policy was developed as recommended by the alert. This set a target of a doctor documenting a basic medication history within six hours of a patient being admitted and a pharmacist to complete MR within 24 hours of admission. The first step in MR is to have a verified comprehensive medication history.

A target of 90% of all patients should be seen by a pharmacist within 24 hours was set. The purpose of this audit was to test this target and find out what was achievable.

**OBJECTIVES**

- To measure how many patients had MR completed by a pharmacist
- To review the changes made to the doctor’s initial medication history

**METHOD**

An audit tool was developed and a week was chosen to collect data from all admissions to the acute medical unit (AMU). The number of drugs listed in the medical record following the doctor’s initial basic medication history was recorded and then the number after the medication history was verified by pharmacy. All alterations to those already documented were also recorded under the following headings: dose/frequency, strength, or formulation (eg, modified release added, or insulin device). If amendments were made to the allergy status this was also recorded. Patients where the data had not been collected before being transferred from the acute setting were followed up wherever possible in their next area of care. The audit was first trialled in 2009 to check the tool was functional and to give baseline data. It has been repeated once a year for three years.

Data were analysed in two ways. Firstly, the percentage of patients who had MR completed within 24 hours and how many were completed on the admissions unit. We compared weekdays against weekends (when pharmacy staff not on unit).

Two years’ audit data for medicines reconciliation within 24 hours of admission

<table>
<thead>
<tr>
<th>Criterion</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of patients admitted in audit period</td>
<td>213</td>
<td>180</td>
<td>197</td>
</tr>
<tr>
<td>Number admitted on weekdays in audit period</td>
<td>165</td>
<td>129</td>
<td>135</td>
</tr>
<tr>
<td>Number admitted on a weekend in audit period</td>
<td>48</td>
<td>51</td>
<td>64</td>
</tr>
<tr>
<td>Number (%) of “rapid turn round” — no medicines reconciliation*</td>
<td>28 (13%)</td>
<td>39 (22%)</td>
<td>29 (15%)</td>
</tr>
<tr>
<td>Number (%) of total admissions that had MR within 24 hours</td>
<td>151 (71%)</td>
<td>100 (56%)</td>
<td>103 (52%)</td>
</tr>
<tr>
<td>Number (%) of weekday admissions that had MR within 24 hours</td>
<td>125 (76%)</td>
<td>90 (70%)</td>
<td>81 (65%)</td>
</tr>
<tr>
<td>Number (%) of weekend admissions that had MR within 24 hours</td>
<td>26 (54%)</td>
<td>13 (25%)</td>
<td>22 (34%)</td>
</tr>
<tr>
<td>Number (%) admitted but lost to follow-up</td>
<td>27 (13%)</td>
<td>15 (8%)</td>
<td>24 (12%)</td>
</tr>
</tbody>
</table>

*“Rapid turn round patients are those admitted then discharged shortly afterwards – usually outside standard working hours (when pharmacy staff not on unit).”

**Table 2: Accuracy of initial medication histories obtained by medical staff**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>152</td>
<td>121</td>
<td>118</td>
</tr>
<tr>
<td>Total number of medicines identified by doctor initially</td>
<td>674</td>
<td>619</td>
<td>653</td>
</tr>
<tr>
<td>Total number of medicines after verified history</td>
<td>938</td>
<td>888</td>
<td>976</td>
</tr>
<tr>
<td>Mean number of drugs missed per patient at initial history</td>
<td>1.7</td>
<td>2.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Number (%) of patients with inaccurate initial history</td>
<td>109 (72%)</td>
<td>106 (88%)</td>
<td>94 (80%)</td>
</tr>
<tr>
<td>Number (%) of drugs with incorrect dosage at initial history</td>
<td>122 (18%)</td>
<td>192 (31%)</td>
<td>138 (21%)</td>
</tr>
<tr>
<td>Number (%) of drugs with incorrect strength at initial history</td>
<td>57 (8%)</td>
<td>160 (26%)</td>
<td>73 (11%)</td>
</tr>
<tr>
<td>Number (%) of drugs with incorrect formulation initially</td>
<td>21 (3%)</td>
<td>144 (23%)</td>
<td>66 (10%)</td>
</tr>
<tr>
<td>Number (%) of patients with inaccurate allergy status initially</td>
<td>11 (2%)</td>
<td>18 (3%)</td>
<td>36 (6%)</td>
</tr>
</tbody>
</table>
RESULTS
From the data we found that the majority of inpatients admitted through the AMU were seen by a pharmacist for the purpose of MR within 24 hours but the percentage has decreased over the three years (see Table 1). Weekday admissions are more likely to have MR completed by a pharmacist than weekend admissions.

The most common amendment to the initial medication history related to medicines that had been missed and not recorded.

Table 2 shows the accuracy of initial medication histories obtained by medical staff.

DISCUSSION
Overall we have found that the majority of patients are seen within 24 hours by a pharmacist. However, the numbers failed to reach 90% and are decreasing. Discussion needs to take place on how much resource to allocate to this service. It may not be practical to expect all patients to be seen by a pharmacist within this timeframe since significant numbers of patients are admitted and discharged outside of pharmacist working hours.

The decreases in the percent of MR completed within 24 hours requires some further investigation. There has been a change in patient flow with patients arriving on AMU later than in 2009. There has been greater emphasis placed on pharmacy staff to contribute to discharge of patients rather than mainly MR (at admission). There have been small changes in pharmacy hours of service which may have contributed. The low percentage seen at a weekend has been attributed to two factors. Firstly although there has been a weekend pharmacy service to wards this has varied with the resource available. Secondly, there is currently limited access to GP information at the weekend which is sometimes vital to complete the medication history. Further changes are planned to the pharmacy service and discussions are taking place on the priorities for medicines reconciliation.

The accuracy of the initial medication history by the clerking doctors was poor. Following these audits we have started to attend FY1 protected training to highlight to them the importance of obtaining an accurate medication history as soon as possible after admission. This audit has highlighted that the pharmacy service to the admissions area is valuable and helps to prevent drug omissions.

REFERENCES

An audit to review the use of intravenous paracetamol within the North West London Hospital Trust

Sidik S, Tse C, Sanghera I
Northwick Park Hospital, North West London Hospitals NHS Trust, London

Paracetamol is available within the hospital trust for administration by oral, rectal and IV routes. The bioavailability and peak plasma concentrations for IV paracetamol are similar to those of the oral formulation. Cost issues are also important as IV paracetamol is currently 250–300 times more expensive than the oral equivalent. Therefore, in order to avoid adverse effects such as line infections and unnecessary costs it is recommended to switch to oral paracetamol as soon as this administration route is possible. From July 2010 the Drugs and Therapeutics Committee (DTC) policy only permits IV administration when the oral (PO), rectal (PR) and enteral routes are not available — for example, when the patients are nil by mouth (NBM), not absorbing (patients with intestinal failure) or experiencing uncontrolled vomiting. The DTC approved a programme in 2010 for the more effective use of IV paracetamol that should enable financial savings for the trust, as it was found to be the highest user of IV paracetamol in London during 2009–10.

From the data we found that the majority of inpatients admitted through the AMU were seen by a pharmacist for the purpose of MR within 24 hours but the percentage has decreased over the three years (see Table 1). Weekday admissions are more likely to have MR completed by a pharmacist than weekend admissions.

The most common amendment to the initial medication history related to medicines that had been missed and not recorded.

Table 2 shows the accuracy of initial medication histories obtained by medical staff.

OBJECTIVES
- To measure the use of IV paracetamol against the recommendations of the new trust guidelines.
- To determine the main reasons for inappropriate prescribing of IV paracetamol.
- To refine recommendations to improve prescribing compliance.

STANDARDS
1 100% of patients should not be prescribed paracetamol as IV/PO if they are taking all other medicines orally.
2 100% of patients should receive oral paracetamol, except when the oral route is unavailable, where the patient is NBM, experiencing uncontrolled vomiting or has intestinal failure and is not absorbing.
3 100% of prescriptions should specify the duration and route to be administered.
4 100% of pharmacists should intervene on inappropriate prescribing (in relation to reasons for use).

METHODS
A pilot study was carried out and feedback was obtained from the pharmacists. Improvements were subsequently made on the data collection form. This recorded relevant information on each dose of paracetamol administered, such as the route prescribed, whether the patient was receiving other oral medicines at the time, the reason for IV administration, duration and consultant details. Briefing sessions were held for all pharmacists regarding the audit and were shown how to use the form appropriately prior to the data collection period. Ward pharmacists were asked to identify patients on the general medical and surgical wards who were prescribed paracetamol, this included IV/PO/PR, during a five-day period (Monday to Friday). No data was collected on weekends due to service level restrictions.

RESULTS
During the five-day data collection period, 468 prescriptions of paracetamol were assessed against the prescribing standards. Overall, the standards of the audit were not met. The main findings are illustrated below: Figure 1 illustrates prescribing patterns.

16% of patients receiving IV paracetamol were receiving other oral medication. 94% of patients who were prescribed IV/PO paracetamol were...
receiving other oral medicines, these figures may therefore highlight inappropriate prescribing. (Only 6% of these patients were prescribed paracetamol appropriately). This is a significant finding as patients who can receive other medication orally may also be able to receive oral paracetamol. Therefore, prescribing paracetamol as IV/PO when the patient is receiving other oral medication may not be required. For these reasons Standard 1 was not met.

49% of IV administration was appropriate and complied with trust restrictions, ie, these were either nil by mouth patients, patients with intestinal failure (ileus) and those who were experiencing uncontrollable vomiting. However, 51% of patients receiving IV paracetamol were inappropriate and did not adhere to trust restrictions, therefore Standard 2 of the audit was not adhered to. Examples of this include IV paracetamol being prescribed for post-operative pain, fractures and abscess drainage.

The third standard of the audit was also not achieved; as illustrated in Figure 2. This is because the length of time for the course of IV paracetamol to be received was documented in only 27% of cases, consequently not meeting Standard 3.

Furthermore Standard 4 was not attained, as no interventions were made by pharmacists in these situations.

DISCUSSION AND CONCLUSION

Identifying conditions associated with non-adherence to trust restrictions as described above, may provide an opportunity for implementing effective change. For example, wards that were shown to have lower compliance (eg, surgical and orthopaedic) can be targeted for education and training. IV paracetamol was most often administered post-operatively, even after the patient’s food intake restrictions may have been lifted — eg, patient is no longer “nil by mouth” and can sip some water to take paracetamol orally. The duration of IV use was not often noted on the drug chart, nor were reasons Standard 1 was not met.

The audit was conducted on Wednesday 17 November 2010 on all wards excluding mental health and maternity wards, at the three sites comprising the structured process of medicines management through pharmaceutical interventions. The audit was to document the number and classification of all pharmaceutical interventions occurring on the wards at NWLH Trust. They have been classified as minor, moderate or major using the definitions adopted by the following study, “Assessing pharmacy Interventions at Salisbury Health Care NHS Trust (SHC)”.

OBJECTIVES

A one-day audit:

- To quantify the number and classification of pharmaceutical interventions on wards receiving a ward pharmacy service
- To determine the significance of these pharmaceutical interventions as either minor, moderate or major
- To determine the baseline intervention rate per patient
- To determine the percentage of interventions requiring the prescriber to be contacted

STANDARD

100% of inpatient drug charts seen on the ward should require no interventions by a pharmacist.

METHOD

The audit was conducted on Wednesday 17 November 2010 on all wards excluding mental health and maternity wards, at the three sites comprising the NWLH trust. All ward pharmacists received guidance on data collection in the form of emails and a compulsory short briefing session prior to this date. A data collection form which had been piloted and approved was used to document each pharmaceutical intervention. The completed data collection forms were then reviewed by a panel of three senior clinical pharmacists to verify the clinical significance.

RESULTS

A total of 440 patients were seen by pharmacists on the day of the audit, resulting in the recording of 132 pharmaceutical interventions. Figure 1 indicates that the most frequent interventions conducted involved drug history (53 interventions, 40%), followed by reviewing the dose, frequency and strength (20 interventions, 15%) and reviewing the need for drug therapy (15 interventions, 11%). With regards to classification of significance, 57 interventions (43%) were regarded as minor; 67 (51%) as moderate and eight

An audit of ward pharmacy interventions

Wilson D, Jivraj M, Sanghera I

Northwick Park Hospital, the North West London Hospitals NHS Trust (NWLH), London

Understanding the causes of medication errors and how they can be avoided has been at the forefront of National Health Service (NHS) policy in recent years. In January 2004, the Department of Health published the report “Building a safer NHS for patients: improving medication safety”, which explored the causes and frequency of medication errors occurring within the NHS. It emphasised the critical role pharmacists have to play in the structured process of medicines management through pharmaceutical interventions, involving the review of patients’ medication throughout their stay as well as on admission to, and on discharge from hospital.

A pharmaceutical intervention in this context is any action by a pharmacist that directly results in a change in patient management or therapy. Examples of an intervention include reconciling a patient’s medication on admission, reviewing medication in view of the presenting complaint or co-morbidities and overcoming supply issues. The aim of this audit was to document the number and classification of all pharmaceutical interventions occurring on the wards at NWLH Trust. They have been classified as minor, moderate or major using the definitions adopted by the following study, “Assessing pharmacy Interventions at Salisbury Health Care NHS Trust (SHC)”.

OBJECTIVES

A one-day audit:

- To quantify the number and classification of pharmaceutical interventions on wards receiving a ward pharmacy service
- To determine the significance of these pharmaceutical interventions as either minor, moderate or major
- To determine the baseline intervention rate per patient
- To determine the percentage of interventions requiring the prescriber to be contacted

STANDARD

100% of inpatient drug charts seen on the ward should require no interventions by a pharmacist.

METHOD

The audit was conducted on Wednesday 17 November 2010 on all wards excluding mental health and maternity wards, at the three sites comprising the NWLH trust. All ward pharmacists received guidance on data collection in the form of emails and a compulsory short briefing session prior to this date. A data collection form which had been piloted and approved was used to document each pharmaceutical intervention. The completed data collection forms were then reviewed by a panel of three senior clinical pharmacists to verify the clinical significance.

RESULTS

A total of 440 patients were seen by pharmacists on the day of the audit, resulting in the recording of 132 pharmaceutical interventions. Figure 1 indicates that the most frequent interventions conducted involved drug history (53 interventions, 40%), followed by reviewing the dose, frequency and strength (20 interventions, 15%) and reviewing the need for drug therapy (15 interventions, 11%). With regards to classification of significance, 57 interventions (43%) were regarded as minor; 67 (51%) as moderate and eight
An audit of prescribing standards

Wong K, Sanghera I, McGrath D
Department of Pharmacy, North West London Hospitals NHS Trust

With an estimated half a million prescriptions written in NHS hospitals every day, it is widely acknowledged that patients are at high risk of adverse drug effects due to prescribing, supplying and administration errors. It is well-established that prescribing errors are the most significant medication errors. Common causes of prescribing errors identified by the Department of Health (DoH) include confusion in drug names, use of abbreviations, illegibility of prescriptions and poor history taking. These errors may subsequently result in major health consequences on the patients and substantial financial loss for the hospitals. Hence, it is crucial to audit the prescribing standards regularly to ensure errors are not repeated. For the first time, a wide range of prescriptions was audited to monitor the prescribing in the trust annually.

OBJECTIVES
● To audit the prescribing standards of a sample of 50 prescriptions over two days.
● To determine the common inadequacies in trust prescribing.
● To make recommendations to improve prescribing compliance.

STANDARDS
● 100% of trust prescribing should comply with the medicines policy prescribing standards.

METHOD
Fifty prescriptions were sampled across the two hospitals of the trust as part of the annual audit for prescribing according to the medicines policy. Before the audit was conducted, 39 different prescribing standards were derived from the medicines policy and a data collection form was designed. A pilot was conducted and feedback was obtained from the ward pharmacists. Improvements were subsequently made on the data collection form. Seven TTA’s (to-take-away), seven inpatient drug charts, seven outpatient prescriptions and four theatre notes were randomly assessed against the prescribing standards in each site of the trust and the data were collected by a pharmacist and a pre-registration pharmacy trainee on two separate days on each site. Results were then collated into separate spreadsheets for the individual standards.

RESULTS
Overall, an average of 45% of the prescriptions met the prescribing standards. Therefore the standard of this audit was not met. The main findings of this audit are highlighted in Table 1. On a positive note, all the prescriptions audited were written in full. Medications that are often abbreviated, such as isosorbide mononitrate, were repeatedly seen to be written in full by doctors during the data collection. Although no more than 70% of the patients’ allergy status was stated on the prescriptions, only 46% of the nature of allergy was indicated in patients who are allergic. Unsurprisingly, additional instructions were not written appropriately. Common missing instructions were “with or after food” for aspirin and indications for antibiotics.

DISCUSSION AND CONCLUSIONS
Repeated use of the brand name Oramorph instead of morphine sulphate oral solution with the strength omitted was observed in this audit. This could result in Oramorph concentrated solution, which is 10 times stronger, being supplied to the patients causing harm. The National Patient Safety Agency issued an alert in 2008 regarding the prescribing and administration errors of strong opioids such as morphine and stressed the importance of pharmacists interventions in preventing medication errors. Figure 1 shows that the most frequent pharmaceutical intervention made on the day of the audit was in relation to drug history (40%), followed by reviewing the dose, frequency and strength (15%) and reviewing the need for drug therapy (11%). The results show a low incidence of pharmaceutical interventions relating to adverse drug reactions (1%) and drug interactions (1%). Whether this implies a low incidence of these events and thus accurate prescribing or a training need in the pharmacists to identify such events is unclear. The importance pharmacists play in preventing medication errors can be clearly demonstrated by the fact that if 6% of the total pharmaceutical interventions made are classified as major, they are making in the region of 50 major interventions a week or 2,600 a year. Despite potential limitations to this extrapolation, these findings could be potentially detrimental for patient outcome.

Underreporting of interventions conducted may have reduced the reliability of the results. This may be due to numerous factors such as staff sickness, annual leave and the length of period over which the audit was conducted. Extensive training prior to the audit and an increase in the length of period over which the audit was conducted could significantly increase the reliability of the results and reduce the speculation for bias. The use of a multidisciplinary classification of interventions system, involving senior doctors, nurses and pharmacists would also enhance the credibility of the results. At NWLH the pharmaceutical intervention reporting system could be adapted to include intensive pharmaceutical intervention recording for one week every six months. Qualitative and quantitative reports generated from this data could be presented to trust risk managers, and for analysis within the pharmacy department. These reports could also be used in the training and induction of new prescribers to the trust, highlighting the rate of prescribing errors and the types that occur. Currently at NWLH all major interventions should be recorded by pharmacists on the Datix Incident Reporting System. This could be further used in the form of intervention feedback sessions for major interventions, which could be incorporated into the monthly ward pharmacy meeting and multidisciplinary clinical governance meetings. If similar intervention reporting systems were adopted by other trusts, problem areas and resolution strategies could be shared at national level.

REFERENCES
3 Dodd C. Assessing pharmacy interventions at Salisbury Health Care NHS Trust. Hospital Pharmacist 2003; 10: 451-456

Table 1: Percentage of compliance of different prescribing standards

<table>
<thead>
<tr>
<th>Prescribing standard</th>
<th>Compliance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) All prescriptions must be written using the approved names (except for combination drugs or brand specific drugs)</td>
<td>76</td>
</tr>
<tr>
<td>(b) Allergy status and type of reaction must be stated on the prescriptions</td>
<td>70</td>
</tr>
<tr>
<td>(c) The strength or dose must be indicated and in “milligrams” if &lt;1g, in “micrograms” when &lt;1mg and in “nanograms” if &lt;1mcg</td>
<td>90</td>
</tr>
<tr>
<td>(d) The words “micrograms”, “nanograms” and “units” must be written in full</td>
<td>23</td>
</tr>
<tr>
<td>(e) The VTE risk assessment must be completed</td>
<td>50</td>
</tr>
<tr>
<td>(f) Appropriate VTE treatment must be prescribed if necessary</td>
<td>92</td>
</tr>
<tr>
<td>(g) Additional instructions must be written by the prescriber as per ward pharmacy standards</td>
<td>23</td>
</tr>
<tr>
<td>(h) The prescriptions must be written in full with NO drug abbreviation except GTN (glyceryl trinitrate)</td>
<td>100</td>
</tr>
</tbody>
</table>

An audit of prescribing standards

With an estimated half a million prescriptions written in NHS hospitals every day, it is widely acknowledged that patients are at high risk of adverse drug effects due to prescribing, supplying and administration errors. It is well-established that prescribing errors are the most significant medication errors. Common causes of prescribing errors identified by the Department of Health (DoH) include confusion in drug names, use of abbreviations, illegibility of prescriptions and poor history taking. These errors may subsequently result in major health consequences on the ward should require no interventions by a pharmacist. The results of the audit indicate that the standard set has not been met, thus emphasising the importance of pharmacists interventions in preventing medication errors.
Implementing electronic prescribing with pharmacist heavily involved
Improving the current reporting system by providing feedback of
Revising training for junior doctors who are known to be deficit in
prescribing standard of inpatient and outpatient should be assessed.

Finally, difference between the professional groups compare?

The main limitation for this audit was the low number of prescriptions sampled due to time restriction. As data was not collected on the total number of prescriptions during the audit period, the proportion of prescription this represented in the trust was not determined. Nevertheless, it was a sample size agreed at the medicines management meeting.

In conclusion, the trust prescribing did not meet the standard of this audit and the critical issues in the trust prescribing were determined. In future, a re-audit on the effectiveness of the recommendations should be done. A larger sample size should be used to provide a general idea of the prescribing standards in the trust. Finally, difference between the prescribing standard of inpatient and outpatient should be assessed.

REFERENCES

Knowledge on safe use of insulin — how do different healthcare professional groups compare?

McFarlane F
Wirral University Teaching Hospital NHS Trust, Wirral

Insulin is recognised as a high risk medicine, thus prompting the National Patient Safety Agency to issue a rapid response report on the safer administration of insulin in June 2010.1 A key recommendation was for all healthcare professionals expected to prescribe, prepare and administer insulin to complete training. Following the training healthcare professionals should prescribe insulin correctly using the proprietary name and writing “units” in full, ensure an insulin syringe or commercial pen device is used to measure insulin doses and demonstrate a clear knowledge of duration of action of the commonly used insulins. This study seeks to determine healthcare professionals’ current level of knowledge around insulin prior to undertaking training. The results will help inform the content of the trust insulin training session to be developed in response to the NPSAs’ recommendations.

OBJECTIVES
1 To assess Foundation 1 (F1) doctors’, Foundation 2 (F2) doctors’, band 6 pharmacists’ and fifth year medical students’ knowledge on some areas of insulin therapy including prescription writing, measuring insulin doses, duration of action of insulins and identification of appropriate regimes.
2 To determine if there is a difference in knowledge about insulins between different healthcare professionals.

METHOD
F1 doctors, F2 doctors, Band 6 pharmacists and fifth year medical students were asked to complete an anonymous multiple choice questionnaire about insulin under examination conditions. The medical staff were based at the trust. The pharmacists worked in the trust and other hospitals in the region. The staff selected were participating in training sessions. The participants were given no prior notice that they were going to be assessed. The response rate was 100%.

RESULTS
A total of 92 questionnaires were completed by 30 F1 doctors, 23 F2 doctors, 24 pharmacists and 15 medical students. Seventy-seven percent of all participants correctly identified how to prescribe insulin (ie, use of proprietary name and writing “units” in full), with similar scores across all groups. Twenty-one percent of participants incorrectly used the generic name to prescribe insulin (6% pharmacists, 13% F2 doctors, 20% medical students and 23% F1 doctors) and one medical student and one F1 doctor used the abbreviation “iu”.

Ninety-eight percent of participants identified that insulin should only be measured in an insulin syringe or commercial insulin pen device. One medical student and one F1 doctor answered that a 1ml intravenous syringe could be used to measure insulin.

The participants were asked to identify the duration of action of five insulins as either short or long acting. The results are summarised in Figure 1. The participants were then asked to identify whether five regimes of insulin under examination conditions. The medical staff were based at the trust. The pharmacists worked in the trust and other hospitals in the region. The staff selected were participating in training sessions. The participants were given no prior notice that they were going to be assessed. The response rate was 100%.

Figure 2 shows the percentage of healthcare professionals correctly identifying three appropriate insulin regimes.

![Figure 1: Percentage of healthcare professionals correctly identifying the duration of action of five insulin products](image1)

![Figure 2: Percentage of healthcare professionals correctly identifying three appropriate insulin regimes](image2)
DISCUSSION
The results identified that no one healthcare professional group demonstrated an overall superior knowledge in all areas and that there was no consistency in the scores between the different healthcare groups. This will partly relate to the insulin training participants have received previously and also which insulins they are more familiar with in clinical practice.

Participants demonstrated a poor knowledge of the duration of action of different insulins with only 40% correctly identifying Humalog as short acting. Interestingly, at the trust there have been clinical incidents where Humalog has been administered at the wrong time. Poor knowledge around duration of action of insulins meant that participants were then unable to correctly identify appropriate insulin regimes. Only 18% of participants identified Humalog three times a day and Levemir at night as an appropriate regime. Fifty-four per cent correctly identified Humalog Mix25 twice daily as an appropriate regime. Humalog Mix25 has been confused with Humalog at the trust due to the similar names and this study has reinforced the need to ensure training around these insulins is delivered. More participants recognised NovoRapid three times a day and Lantus at night as correct, probably because this regime is commonly prescribed in the trust.

The results have clearly highlighted that all healthcare professionals need further insulin training. Insulin training is now mandatory in the trust; staff either attend a lecture or complete the NPSA recommended e-learning programme. The lecture reflects the content of the NPSA e-learning programme, local documentation for prescribing insulin and the knowledge gaps identified in this study. Reference is made to insulin errors, particularly those that have occurred locally with Humalog and Humalog Mix25.

REFERENCES

Audit of documentation and patient knowledge of insulin doses at discharge from a teaching hospital

McFarlane F, Power B, Williams L, Tiernan N, Chanin T
Wirral University Teaching Hospital NHS Foundation Trust, Wirral

Insulin is cited by the National Patient Safety Agency as one of the top five high alert medications. Errors in insulin administration can potentially have severe outcomes and on rare occasions lead to death. In June 2010 the NPSA issued a rapid response report “Safer administration of insulin”. This is the first alert addressing how to minimise risks with insulin.

All patients should have clear written instructions on how to take their medicines at discharge. Most medicines are labelled with dosage directions but for medicines with variable dosing such as insulin it is not appropriate to put dosage directions on the label. For insulin, the accepted practice in the trust is to document the dose at discharge in the patient’s blood glucose monitoring diary. However there are a wide range of diaries in use and patients do not always bring their diary with them when admitted into hospital. It is also unclear if all members of the healthcare team are familiar with this system and actually follow it.

At the trust a recent clinical incident highlighted the need to review the current system for documentation of insulin doses at discharge. The incident raised concern that some patients may be discharged without receiving clear written documentation of their insulin doses.

OBJECTIVES
1 To determine whether the patient knows the dose of insulin to administer after discharge.

2 To identify the method by which the insulin dosing schedule is communicated to the patient at discharge.

METHOD
Over a two-month period all adult patients admitted to the trust on insulin were identified using the trust’s electronic prescribing system. Patients were consented into the study during their admission, the trust research committee did not require full ethics approval. After discharge each patient was followed up within three days with a telephone interview to determine what information they received on discharge about insulin dosing and how this was documented.

RESULTS
A total of 91 patients admitted to the trust during a two-month period were identified as being on insulin. Consent for participation in the audit was obtained from 40 of these patients. Data collection forms were completed for 34 patients during their admission, of which 20 were successfully contacted post discharge and completed the telephone interview.

Figure 1 illustrates whether patients stated that they were advised of an insulin dose at discharge and by whom. Fourteen (70%) patients stated that they were advised to take a specific dose of insulin at discharge by either the diabetes specialist nurse or ward staff nurse. Figure 2 shows the method of communication used by the nurses to convey the insulin dose schedule to the patient. Six patients received written information. For one patient it was recorded in their blood glucose diary and for three it was handwritten on a blank sheet of paper or discharge letter. The remaining two patients were having their insulin administered by a community nurse. The community nurses were contacted and in both cases they received a trust administration chart documenting the insulin dose to be administered post discharge.

Six patients said they were given no advice regarding their insulin dose on discharge. These patients continued to administer the doses of insulin they were on prior to admission, adjusting doses themselves according to blood glucose readings.

DISCUSSION
The results of the study indicate that documentation of insulin doses at discharge is very poor. Six patients stated that they were provided with written documentation, but in three of these cases the documentation consisted of writing on ad hoc pieces of paper. Only one patient out of 20 stated that they had their dose of insulin documented in their blood glucose diary, the accepted standard in the trust. Unfortunately the study did not investigate how many of the patients admitted on insulin actually brought their blood glucose monitoring diary into hospital. From daily clinical practice it is well recognised that patients on insulin do not always take their blood glucose diary into hospital when admitted. There is no one standardised diary for use so nursing staff do not readily ask about or recognise a patient’s blood glucose monitoring diary.

The six patients who were given no information on their insulin dose at discharge were fortunately able to self manage their diabetes. These
patients reverted back to the dosing schedule they were administering prior to admission. None of the patients reported any problems with poor glycaemic control following discharge.

The NPSA is expected to release a further alert later this year recommending the use of a patient-held insulin passport system to ensure adequate recording and documentation of insulin doses. It is hoped that the success of the yellow anticoagulant patient-held information can be replicated with the insulin passport system. This trust would welcome the introduction of a nationally recognised patient-held insulin passport. Medical and nursing staff could be educated to ensure doses of insulin were documented at discharge in the insulin passport (as per current practice with anticoagulant therapy). Pharmacists could then check that this has been completed before the patient’s discharge prescription was processed.

This study only used one data source—a question asking patients to report the information given. Although future studies could use other data sources, patient perception and understanding are the most important for the self-management of chronic diseases such as diabetes. The results highlighted that only a few patients received clear written information of insulin doses at discharge. Inadequate documentation of insulin doses could potentially result in harm to the patient and possible re-admission into hospital.

REFERENCES

Figure 2: Method of communication of insulin doses (n=14)

<table>
<thead>
<tr>
<th>Insulin Diary</th>
<th>Community Nurse Chart</th>
<th>Paper record</th>
<th>Verbal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

An audit of prescribing practice of oxycodone in patients receiving palliative care at Wirral University Teaching Hospital NHS Foundation Trust against current international and local guidance

Cooke J, Tyrrell J, Currie C
Wirral University Teaching Hospital NHS Foundation Trust

Oxycodone is a semi-synthetic strong opioid licensed for the treatment of moderate to severe pain in patients with cancer. It exhibits similar analgesic effects as morphine at equivalent doses. A meta-analysis of randomised controlled trials concluded that there was no difference between the mean pain score of patients treated with oxycodone compared to those treated with morphine, similar discontinuation rates were seen in both groups due to adverse events. Using morphine as the first-line agent for moderate to severe cancer related pain is supported by the WHO analgesic ladder step 3 and the European Association for Palliative Care. The Merseyside and Cheshire Palliative Care Network Audit Group (MCPCNAG) advise morphine as the strong opioid of choice in patients requiring pain relief in palliative care and that any change is documented in the patient’s case notes.

The preferential use of oxycodone in renal impairment is controversial: there are minimal data demonstrating that oxycodone metabolites are less problematic than other opioid metabolites in renal impairment. Therefore, the MCPCNAG recommend that morphine remains the first choice opioid when a patient’s creatinine clearance rate is greater than 30mls/min. Prescribers sometimes opt to convert patients from morphine to oxycodone if neuropathic pain is also present. This is contrary to local guidance; adjuvant analgesics such as amitriptyline, gabapentin and clonazepam are suggested as first-line options. Since oxycodone is four to five times more expensive than the equivalent dose of morphine, the inappropriate use of oxycodone exerts a financial pressure upon NHS trusts. During the financial year 2009–10, Wirral University Teaching Hospital (WUTH) spent over £138,000 on oxycodone preparations.

At WUTH, palliative care specialist nurses see patients on a referral basis and make recommendations about treatment with the support of the palliative care consultant. Patients are reviewed at weekly multidisciplinary team meetings and where necessary are followed up on the palliative care ward round.

OBJECTIVES
1. Determine the number of patients that have been prescribed oxycodone first line and determine if its use was in line with current local guidelines.
2. Determine reasons why oxycodone was used in preference to morphine.
3. Establish who was advising changes to opiate prescribing.
4. Quantify the cost associated with inappropriate oxycodone prescribing.

METHOD
Data was collected over a 14-day period with patients identified via the trust’s electronic prescribing system. Patients’ case notes were reviewed to determine: oxycodone preparation, previous morphine use, reason for initiation/conversion to oxycodone and the healthcare professional advising the opioid initiation/conversion. This information was compared with local and international standards to establish the appropriateness of oxycodone prescribing. Patients were excluded from the audit if they were not using oxycodone in palliative treatment (eg, post-operative patients). Paediatric patients were also excluded.

RESULTS
Thirty-six patients were prescribed oxycodone; 23 were receiving palliative care (the remainder were excluded from the audit). Oxycodone was newly initiated in 18 patients; however, only 10 had previously been prescribed morphine during the inpatient stay. For those patients already established on oxycodone on admission, four had previously been prescribed morphine in the community. The majority of recommendations for the use of oxycodone were made by either the community or hospital palliative care specialist nurses.

Table 1 summarises reasons why oxycodone was prescribed or recommended. Only one in five prescriptions for oxycodone was considered...
appropriate and in line with current guidance; the remaining 80% of oxycodeone prescribing was considered inappropriate. Reasons for inappropriate prescribing included: treatment of neuropathic pain, conversion/initiation due to mild renal impairment (ie, creatinine clearance rate greater than 30ml/min), patients not previously treated with morphine and in several cases there was no documented reason. Only 10 of the 25 patients (40%) reviewed had appropriate documentation in the case notes.

**DISCUSSION**

There is minimal evidence to support the use of oxycodeone for neuropathic pain or in renal impairment.2,3 We identified several occasions where prescribers used serum creatinine result to assess renal function without calculating creatinine clearance (CrCl) rates. Four patients had minimally raised creatinine but their CrCl was calculated at >30ml/min.

This audit has highlighted poor documentation by health professionals when recommending oxycodeone. Prescribing guidance within the trust states that any change to a patient's therapy must be documented in their medical notes. As the palliative care specialist nurses are only offering a recommendation to prescribe oxycodeone, we suggest junior doctors and pharmacists insist that reasons for the decision need to be documented. The doctor can then make an informed clinical assessment and challenge inappropriate recommendations.

Education and feedback of results from this audit to the palliative care team and future re-audit will ascertain if this has altered prescribing practices. Another recommendation is to provide pharmacist support to the palliative care MDT and ward rounds in order to reliably calculate eCrCl and challenge decisions where necessary.

Based on the results of this audit, it is estimated that potential annual savings of £20,000 for the trust and £100,000 for the PCT could be realised if oxycodone is prescribed appropriately. The results of this audit are limited by the short snapshot period that may not be indicative of practice across the organisation and the relatively small number of patients.

**REFERENCES**


---

**Clostridium difficile: an orthopaedic problem?**

**Houston R, Oates K**

Countess of Chester NHS Foundation Trust, Chester

*Clostridium difficile* infection (CDI) incidence has increased in the UK since the 1990s.1 There are many risk factors for developing CDI, including use of antibiotics.1 Although all antibiotics can disrupt the colonic microflora, potentially causing *Clostridium difficile* to proliferate and cause disease,2 broad spectrum antibiotics, particularly cefalosporins are a particular risk for development of CDI.3

An outbreak of *Clostridium difficile* was declared at the Countess of Chester NHS Foundation Trust, a district general hospital, in March 2008. This led to a review of antibiotic policies, including the policy for prophylactic antibiotics used in orthopaedic surgery. The existing orthopaedic policy was to use intravenous (IV) cefuroxime 1.5g at induction, followed by up to two post-operative doses. We adapted our protocol in line with the Department of Health document “*Clostridium difficile* infection: how to deal with the problem” with a view to minimising the use of broad spectrum agents such as cefalosporins, especially in elderly patients, and limiting surgical prophylaxis to a single dose near to the operation.1 Patients undergoing emergency trauma surgery were given single doses of IV teicoplanin (400mg) plus IV gentamicin (dose dependent on patient weight) on induction and we subsequently re-audited to assess the impact on CDI incidence.

**OBJECTIVE**

To assess if the change in policy for prophylactic antibiotics used in orthopaedic surgery had reduced rates of *Clostridium difficile* infection (CDI) in the orthopaedic trauma patient group at the Countess of Chester NHS Foundation Trust.

**METHOD**

Data held by the infection control team regarding the number of cases of CDI was reviewed from April 2008 to September 2010. Statistics for number of cases were taken from the microbiology laboratory figures and are part of the mandatory reporting to the Health Protection Agency. The number of cases reported on the orthopaedic trauma ward in the 12 months before and after the change in antibiotic policy was compared.

**RESULTS**

The table shows the number of cases of CDI on the orthopaedic trauma ward in the 12 months before and after the policy change. In the 12 months prior to the change in antibiotic policy (May 2008 to April 2009), 22 cases of CDI were reported in patients on the orthopaedic trauma ward. In the 12 months following the change in antibiotic policy there were no cases of CDI reported on the orthopaedic trauma ward. There were no cases of CDI infection reported for patients on the elective orthopaedic ward in the data reviewed (April 2008 to September 2010). In 16 months since the change in policy there have been a total of four cases of CDI reported on the orthopaedic trauma ward.

**DISCUSSION**

Our results are consistent with other work demonstrating that switching away from cefuroxime use in orthopaedic prophylaxis can reduce CDI rates.4 Teicoplanin and gentamicin have both been shown to be acceptable antibiotics for orthopaedic prophylaxis in previous studies.5 There has been a dramatic reduction in the rate of CDI at the Countess of Chester in the elderly orthopaedic trauma patient group since the switch in prophylaxis. This is likely to be attributable to a combination of improved hand hygiene, increased staff awareness of issues around CDI and regular audit of cleaning standards on wards, but improved antibiotic prescribing is key. The policy in elective orthopaedic patients was left unchanged and IV cefuroxime (up to three doses of 1.5g) continues to be used for prophylaxis in these patients. As this group of patients is younger than the trauma group, and there were no cases of CDI reported in this group from April 2008 to date it is felt that a change in antibiotic policy is not necessary in this patient group at this time.

Although individual drug charts were not analysed in this audit, the prescribing in this clinical area is analysed on a rolling programme for the Advancing Quality data. This provides regular feedback to clinical teams on compliance with policies, including adherence to prescribing policies to constantly drive improvements in care.
Our data correlates with other published data demonstrating that CDI rates are higher within orthopaedic trauma patients than orthopaedic elective patients. The policy for orthopaedic elective patients would need to be reviewed if an increase in CDI was observed in this patient group. Communication with the infection control team at the trust had confirmed that incidence of surgical site infection (SSI) is extremely low in the patient group audited. A full review of the SSI data will form a further audit at the trust to follow up this issue.

CONCLUSION

The change in orthopaedic prophylaxis away from cefalosporin use gave a dramatic reduction in rates of CDI within the patient group studied. Although it is accepted that to achieve and sustain reduced CDI rates, a multifactorial approach is required, antibiotic stewardship is essential and this audit demonstrates how a switch in antibiotic policy may help to reduce rates.

REFERENCES

Can a pharmacist improve adherence to current guidelines for pharmacological management of patients following acute ischaemic stroke?

Bethune KM
University Hospital of Wales, Cardiff and Vale University Health Board, Cardiff

Recent guidelines recommend that all patients who have suffered an acute ischemic stroke should receive the following treatment:

- Aspirin 300mg orally or rectally starting within 24 hrs of stroke
- Venous thromboembolism (VTE) prophylaxis with low molecular weight heparin (LMWH)
- Lipid lowering therapy with a statin
- Medicines reconciliation, performed by a pharmacist within 24 hours of admission, to hospital to ensure that pre-existing medication is prescribed following admission and all medication is prescribed in an appropriate formulation

Patients admitted to this large teaching hospital following an acute ischaemic stroke are only admitted directly to the stroke ward if they receive thrombolysis. Patients who do not receive thrombolysis may be admitted to any ward in the hospital and only transferred to the stroke ward when a bed becomes available. The stroke pharmacist observed during 2010 that patients transferred to the stroke ward from within the hospital were not always receiving the recommended treatment for acute ischaemic stroke and full medicines reconciliation was not always completed before transfer.

OBJECTIVES

The main objective of this audit was to establish whether patients were receiving the recommended treatment for acute ischaemic stroke and whether full medicines reconciliation was performed within 24 hours of admission.

The following audit standards were set:

- >95% patients admitted following an acute ischaemic stroke should receive the recommended treatment for acute ischaemic stroke within 24 hours of admission to hospital
- >95% patients admitted following a stroke (haemorrhagic and ischaemic) should have a full medicines reconciliation performed within 24 hours of admission to hospital

The secondary objective was to investigate whether intervention by the stroke pharmacist could increase compliance with the guidelines after patients have been admitted to the stroke ward.

METHOD

A data collection tool was developed and piloted by the stroke pharmacist. During January and February 2011 data was collected on all stroke patients admitted directly to the stroke ward or transferred from other wards in the hospital. Data collected included:

- Date of stroke, type of stroke and date reviewed by stroke pharmacist
- Treatment prescribed following acute ischaemic stroke prior to review by stroke pharmacist
- Treatment for acute ischaemic stroke started following review by stroke pharmacist
- Whether full medication reconciliation was performed prior to transfer to stroke ward
- Changes to prescribed medication following review by stroke pharmacist (e.g. omitted or incorrectly prescribed medication and formulation changes for swallowing difficulties) in patients transferred from within hospital.

Data was analysed by the stroke pharmacist using Microsoft Office Excel 2003.

RESULTS

During January and February 2011 67 patients were admitted to the stroke ward following a stroke (five haemorrhagic and 62 ischaemic). A summary of the number of patients receiving recommended treatment following an acute ischaemic stroke within 24 hours of admission to any ward in the hospital and after review by the stroke pharmacist following transfer to the stroke ward is shown in Table 1. The most commonly omitted treatment was VTE prophylaxis, with 27 (44%) of patients not having LMWH prescribed before review by the stroke pharmacist.

Twenty patients were admitted directly to the stroke ward following a stroke (ischaemic or haemorrhagic) and seen by the stroke pharmacist within 24 hours of admission, with 19 (95%) of these had full medicines reconciliation performed within 24 hours admission. Forty-seven patients were transferred to the stroke ward from within the hospital an average of three days after admission (range two to nine days). Although these patients were seen by a pharmacist within 24 hours of admission to this hospital medicines reconciliation was not always complete (see Table
Audit of the adherence to Wirral University Teaching Hospital’s alcohol integrated care pathway

Watts DR†, Bevan P†, Elliott P†

†School of Pharmacy and Chemistry, Liverpool John Moores University; *Pharmacy Department, Wirral University Teaching Hospital NHS Foundation Trust (WUTH)

Alcohol-related hospital admissions are common in the North West of England and between 2004 and 2007 the number of patients in the Wirral area accessing specialist alcohol services increased by 54%. Once an alcohol-dependent person has ceased drinking, management of potential withdrawal with chlordiazepoxide, prevention of Wernicke’s encephalopathy (WE) with thiamine supplementation and treatment to prevent relapse are needed to reduce alcohol-related morbidity.

WUTH has developed a paper-based Alcohol Integrated Care Pathway (AICP), detailing methods of symptom assessment and dosing of medications to manage withdrawal symptoms and vitamin deficiencies. It includes a prescription protocol for the prescriber to sign which details the required frequency of symptom scoring and chlordiazepoxide regime — an initial 48-hour loading dose (20mg every six hours), followed by either a three- or seven-day reducing regime selected by the prescriber based on the patient’s symptom score post-loading dose. The prescription protocol also allows nursing staff to administer “as required” chlordiazepoxide according to symptoms. Doses are adjusted for elderly/frail patients. This symptom-triggered approach is recommended by NICE. The pathway also provides guidance on how to prescribe IV Pabrinex and oral multivitamins/thiamine supplementation according to risk of WE. Poor adherence to the pathway is likely to result in inadequate symptom control, which could ultimately lead to behavioural disturbances and delayed discharge.

DISCUSSION

Neither audit standard was met, with only 26% of patients on the recommended treatment following an acute ischaemic stroke and 64% of patients having a medicines reconciliation completed within 24 hours of admission to hospital.

However, following review by the stroke pharmacist 94% of patients admitted to the stroke ward after an ischaemic stroke were on the recommended treatments. In addition 97% of patients transferred to the stroke ward had medicines reconciliation completed following review by the stroke pharmacist. This clearly demonstrates that a pharmacist can improve adherence to guidelines.

There is a possibility of bias being introduced into the results as the stroke pharmacist was collecting data on their own work.

This audit highlights the need for education of doctors and pharmacists in the recommended treatment following an ischaemic stroke and ensuring that an appropriate formulation is prescribed.

REFERENCES

objectives:

- Blood glucose control
- The use of intravenous fluids containing glucose whilst on sliding scale insulin
- The use of intravenous fluids containing potassium
- Effect on serum electrolyte levels

results:

A total of 24 data sets were eligible for analysis: 12 pre-implementation and 12 post-implementation. Mean blood sugar levels were higher (t test p=0.0024) following implementation of the new guideline. Table 1 summarises the blood glucose information.

Analysis by Chi-squared test (pre- or post-implementation/within or outside range) showed that the number of blood glucose measurements within the desired range was comparable for both patient groups (p=0.92), and there was no significant difference in the number of clinically relevant hypoglycaemic measurements (p=0.16) or proportion of patients who experienced hypoglycaemia (six pre-, seven post- [p=1.0]). Time to normoglycaemia, and time to restore normoglycaemia were similar in both cohorts.

Post-implementation there was a significant increase in the use of glucose-containing fluids and a significant increase in glucose with potassium (both p<0.001). See Table 2. The guideline advocated an infusion rate of 4–5g of glucose/hour, however very few prescriptions met this requirement for the duration of sliding-scale insulin administration. Pre-implementation, mean (and range) infusion of glucose was 1.8g/hour (0–3.5) compared to a post-implementation mean of 2.6g/hour (1.8–4); this difference was not statistically significant (t-test, P=0.057).

Sodium levels in post-implementation patients were more adversely affected than pre-implementation with most patients experiencing a reduction in serum levels. Significantly more patients post-guideline had hyponatraemia (<135mmol/L; two pre-guideline and eight patients post-guideline (Fischers exact test P<0.05 [0.036])). Sodium levels remained unaffected in both cohorts.

discussion:

This audit has determined that the updated chart is at least as safe and effective as its predecessor, with no significant changes in blood glucose control. Further work is being done to reduce the instances of hypoglycaemia. The guideline is being revised and further education of medical staff.

With regards to fluid prescribing, the updated chart appears to have improved guideline adherence, with greater use of fluids containing glucose but may have resulted in unwanted changes to serum sodium levels. It was apparent the junior doctors were prescribing "dex/saline" without specifying the strengths of the components. Nurses were administering glucose 4% and sodium chloride 0.18% rather than glucose 5% sodium chloride 0.45% and potassium 20mmol advocated on the guideline. It has been shown previously that junior doctor knowledge of fluids is poor, with less than 50% of junior doctors knowing the sodium content of sodium chloride 0.9% or daily sodium requirements; this audit supports these results. The guideline and chart are being revised. Pharmacists now give a session on fluid balance to fifth-year medical students. Consultation is under way and it is expected to see a greater emphasis on the use of intravenous fluids containing glucose 5%, sodium chloride 0.45% and potassium 20mmol.

references:

The impact of multidisciplinary education on gentamicin prescribing, administration and monitoring.

McManus S*, Wood S*, McCormick S*, Collier P†
†Department of Pharmacy, Monklands Hospital, NHS Lanarkshire, Airdrie; †Queen’s University, Belfast

NHS Lanarkshire adopted a new first-line empirical antibiotic policy in August 2008. In an attempt to reduce the incidence of *Clostridium difficile*, broad spectrum antibiotics such as the cephalosporins, quinolones and clindamycin were removed from first-line use. In their place the use of vancomycin and gentamicin was suggested for wider indications including severe sepsis. Increasing use of gentamicin led to a rise in the number of incorrect prescribing, administration and monitoring incidents being reported via the online error reporting system, Datix, and also anecdotally via clinical pharmacists. A decision was made by Lanarkshire Antimicrobial Infection Group (LAIG) to improve the gentamicin administration record in order to make it a prescription chart. The roll-out of the new gentamicin prescription chart took place in October 2009.

**OBJECTIVE**

Establish the impact of multidisciplinary education on gentamicin delivery, ie, is the prescribing, administration and monitoring of gentamicin.

- **Standard 1:** 100% of patients’ creatinine clearance should be calculated correctly.
- **Standard 2:** 100% of patients should be prescribed the correct initial dose of gentamicin.
- **Standard 3:** 100% of patients should have their first level taken within the correct time frame.
- **Standard 4:** 100% of patients should have their Urea and Electrolytes (U&E) checked daily.
- **Standard 5:** 100% of gentamicin doses administered should be signed for on the prescription chart and Cardex.

**METHODS**

Following favourable ethical opinion and research and development management approval an audit was undertaken in three medical wards, Speciality Care of the Elderly. Each ward was visited daily by the principal investigator and patients’ notes and Cardexes were checked to identify whether gentamicin was prescribed. The audit tool was then commenced and continued until the course was completed. In the time allocated to data collection, 12 weeks, a total of 30 patients were audited.

A focus group undertook a failure mode effects analysis (FMEA) of the process of gentamicin delivery. FMEA is a recognised prospective risk analysis tool. For a given definition of failure, FMEA identifies the points in a process which are likely to fail, determines how potential changes might affect safety and allows the impact of these changes to be monitored over time.¹ Output from the FMEA helped tailor training on gentamicin delivery for medical and nursing staff. The training included a PowerPoint presentation tailored to the needs of medical or nursing staff and a group discussion on the problems of gentamicin delivery and possible solutions.

The three wards were re-audited following the education sessions as per the baseline audit. In the 10 weeks available for data collection following the education sessions 20 patients who fulfilled the inclusion criteria were audited.

Quantitative data were analysed using an Excel database held securely in the pharmacy department. The mean age and duration of therapy in the two cohorts were compared using an unpaired two sample t test to confirm similarity. In order to compare pre- and post-educational intervention, data were compared using a chi-squared test at 95% confidence level (80% power). If expected cell frequencies were less than 5 then this renders chi-square analysis invalid and instead Fisher Exact Probability Test was used.

**RESULTS**

Fifty patients were audited: 30 pre- and 20 post-intervention. Gentamicin delivery — ie, the prescribing, administration and monitoring of gentamicin — improved from 13% pre-intervention to 35% post-intervention (P=0.09, two tailed Fisher’s exact test). There was a significant improvement in correct gentamicin prescribing from pre-intervention (11%) to post-intervention (95%) (P=0.037, two tailed Fisher’s exact test). Further improvements were made in all the secondary outcomes although they did not reach statistical significance. Accuracy of patients’ creatinine clearances improved from 83% pre- to 94% of patients post-educational intervention. There was an improvement in correct timing of initial serum gentamicin level from pre-intervention (60%) to post-intervention (80%). There was an improvement in percentage of patients receiving daily U&E checks from pre-intervention (47%) to post-intervention (65%). The prescription chart and Cardex were signed in 83% of patients pre-intervention and improved to 95% of patients post-educational intervention.

**DISCUSSION**

These results show multidisciplinary educational interventions improve gentamicin delivery. These tailored interventions produce a statistically significant improvement when considering gentamicin prescribing, and lead to an improvement in all standards set prior to the commencement of the study. A recent Cochrane review² investigated tailored interventions effects on professional practice and health care outcomes and suggested a significant improvement in measured outcomes when using tailored interventions. In considering the process as a whole the likely barriers to effective gentamicin delivery are lack of confidence in the use of gentamicin by medical and nursing staff, lack of familiarity with the monitoring requirements and external barriers such as staffing levels and out-of-hours cover. The educational intervention developed can improve self-belief and lack of familiarity. It cannot, however, effect change to the external barriers and these areas will require further work.

**REFERENCES**


---

**South Wales/Welsh School of Pharmacy Diploma Poster Winner**

**The level of compliance of medicines reconciliation by doctors on admission to The Royal Gwent Hospital**

Moss M, Pugh M
The Royal Gwent Hospital (RGH), Aneurin Bevan Health Board (ABHB)

The National Institute for Health and Clinical Excellence (NICE) and the National Patient Safety Agency (NPSA) have issued guidance on the importance of medicines reconciliation and highlighted the need for departmental policies to ensure medicines are reconciled on admission appropriately.¹ The World Health Organization (WHO) and NICE state that medicines reconciliation should occur within 24 hours of admission.² According to ABHB medicines management policy,¹ a full drug and allergy history should be undertaken by the admitting doctor reconciling any
changes to the medication taken prior to admission, this should be documented on the medicines reconciliation form.

**OBJECTIVE**
The purpose of the audit was to identify whether medicines reconciliation within RGH is being performed within 24 hours of admission by doctors in adherence with local and national guidelines.

**METHOD**
The investigator collected data retrospectively over a nine-week period by visiting the medical admissions unit (MAU) and the surgical admission unit (SAU) to identify patients admitted to RGH within the previous 24–48 hours using the ward transfer list. Exclusion criteria included any patient admitted to MAU/SAU who was not admitted to a ward and was discharged within 24 hours of admission. For each patient, the ward to which they had been transferred was visited. The drug chart, medical notes and medicines reconciliation form were used to complete the data collection form. A pilot study had been carried out previously: Data analysis was performed via hand, followed by entry into Microsoft Excel spreadsheet database to display the results and statistical analysis.

**RESULTS**
Eighty-four percent (42/50) of patient’s notes had a medicines reconciliation sheet within them on admission. Of the 42 sheets in the notes, a total of 38 (90%) had an accurate drug history (DH) documented on them at the time of data collection, 32 (76%) of these had them done within 24 hours of admission. Thirty-six per cent (15/42) had a drug chart written that reflected the information on the medicines reconciliation sheet. Of these, 10/27 were reconciled but changes to the medications on admission were not documented on the sheet, while 17/27 were not reconciled, for multiple reasons.

**CONCLUSIONS**
None of the four standards was met. Only one patient had their medication fully reconciled by a doctor within 24 hours of admission. Another 14 had been reconciled but with the intervention of a pharmacist. There is a need to ensure they understand the process of medicines reconciliation and what they should be doing to comply with national and local guidelines.

**REFERENCES**
3. Aneurin Bevan Health Board. Medicines Management Policy. Code of Practice. Issue 1; issue date 13/05/09; review date 13/05/2011; expiry date 13/05/2012. Policy Number: ABHB/Clinical/0010.

**INNOVATION & PRACTICE DEVELOPMENT**

Reducing medicines waste in emergency medicine

Inston K
Department of Pharmacy, Salford Royal NHS Foundation Trust, Greater Manchester

The NHS is currently facing unprecedented financial pressure, and pharmacists are ideally placed to improve medicines management within NHS trusts. Traditional methods of medicine supply are being challenged, and new ways to safely reduce costs identified. At our trust, emergency medicine has been identified as an area of high medicine wastage. The Emergency Assessment Unit (EAU) has high turnover of patients, with a high proportion discharged directly from the unit. Most of these patients do not require a full supply of their regular medicines on discharge, simply the addition of one or two newly prescribed items. Original pack, “one-stop dispensing”\(^1\), is standard practice throughout the trust. However, in the emergency ward setting this can result in increased pharmacy workload, both from unnecessary dispensing and processing large quantities of unneeded, returned medicines (of which a significant proportion are discarded). Switching to a stock-based ward (and only supplying medicines to patients that are not stock) may be an effective way to reduce wasted resources and cost without compromising efficiency or service.

**OBJECTIVE**
This project was undertaken to assess the impact of implementing a stock-based system on EAU in terms of pharmacy workload and cost of returned medicines.

**METHODS**
Baseline data were collected on the total number of stock and non-stock medicines prescribed and supplied to EAU using the “one-stop dispensing” system during one week in July 2010. Injections were excluded, as they were usually stock items and not ordered from pharmacy. All medicines returned to pharmacy were noted and the costs calculated using current contract prices. EAU was switched to a stock-based ward in September 2010. The system was monitored, and based on preliminary feedback some changes were implemented: the ward stock list was reviewed and extended to accommodate the most common medicines used and patients who had already been allocated a ward for transfer were supplied all necessary medication directly to that ward. By February 2011, the system was fully implemented. Data on medicines prescribed and returned, as described above, were then collected for one week in February 2011. Medicines not transferred with patients to other wards were also included. Additional data on missed doses due to “drug not available” were collected, to assess the wider impact of the change on other wards in the trust. These were collected from data available on the electronic drug chart in the 24 hours following the initial pharmacy medication review.

**RESULTS**
Baseline data collected in July 2010 showed that, of 263 medicines prescribed and dispensed by pharmacy, 66 (25%) were returned. Post-change data collected in February 2011 showed that, of 408 medicines

<table>
<thead>
<tr>
<th>Measure</th>
<th>Baseline (July 2010)</th>
<th>Post-change (February 2011)</th>
<th>Difference (% reduction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items dispensed per day (average)</td>
<td>38.0</td>
<td>20.6</td>
<td>17.40 (46%)</td>
</tr>
<tr>
<td>Number of returns per day (average)</td>
<td>9.4</td>
<td>0.8</td>
<td>8.6 (91%)</td>
</tr>
<tr>
<td>Returns cost per day (average)</td>
<td>£35.30</td>
<td>£17.40</td>
<td>£17.90 (51%)</td>
</tr>
<tr>
<td>Projected return cost per year</td>
<td>£12,985</td>
<td>£6,351</td>
<td>£6,634 (51%)</td>
</tr>
</tbody>
</table>
prescribed, 305 (75%) items were stock and only 103 (25%) were dispensed. The average number of medicines dispensed in pharmacy per day was reduced from 38 to 20.6 (equivalent to a 46% reduction in dispensing workload). Data collected on returns showed that the average number of medicines returned to pharmacy per day reduced from 9.4 to 0.8 under the new system, equivalent to a 91% reduction in returned medicines. The associated average cost reduction calculated was £17.90 per day, equivalent to a 51% reduction in cost. Based on the data collected, the projected annual cost reduction would be £6,534. Table 1 summarises the data collected at baseline and post-change. There were 15 missed doses identified post-change; 12 (80%) due to medication not being stock on the ward patients were transferred to, two (13.3%) due to medication not being transferred with patients and one (6.6%) due to a stock item not being available on EAU itself. Medicines not transferred with patients to other wards accounted for 7.8% of total items dispensed.

**DISCUSSION**

The baseline data demonstrated that returned medicines were a significant issue, with 25% of medicines dispensed later returned to pharmacy. Implementing a stock-based ward system produced a clear reduction in pharmacy workload, with a 46% reduction in dispensing, 91% fewer medicines returned and costs reduced by half. It was acknowledged that increased stock expenditure would impact on this saving, although this was not measured. It was also noted that the number of medicines prescribed in February was 35% higher than July; this suggests that cost savings may be higher than captured. The wider impact on the trust was considered. Although a low rate of missed doses was observed, it was felt that this could be improved, and work is underway to highlight the issue of missed doses and the importance of medication transfer.

This study has highlighted the potential cost savings that can be achieved in emergency medicine and challenges traditional methods of medicines supply using the “one-stop dispensing” system to high turnover wards.

**REFERENCES**


---

**Clinical pharmacy service redesign — first steps**

**Wright J**

East & South East England Specialist Pharmacy Services, London

The NHS White Paper “Equity and excellence: liberating the NHS” recognises the increasingly important role played by pharmacists in optimising patients’ medicines. However, clinical pharmacy practice has developed opportunistically without support from a clear published evidence base, resulting in a wide diversity of services across Britain. The current pace of change requires teams to take a hard look at what their service has become and consider whether it meets the current needs of the organisation and its patients, or will fit with organisational priorities for the future.

**OBJECTIVE**

The objective of the project was to determine whether using a specifically designed toolkit supported by a series of learning sets over a fixed time period was of value in facilitating the redesign of clinical pharmacy services to meet future priorities.

**METHOD**

In 2008 the clinical pharmacy directorate of the East & South East England Specialist Pharmacy Services launched a toolkit entitled “Clinical Pharmacy: Delivering a 21st Century Service” to help clinical pharmacy leaders critically review the services they offered and manage resulting changes. The toolkit contained activities that were supported by tools for service evaluation. Best practice tips and signposting to resources were also included. To assist them with its use, practitioners across the geography were invited to participate in a series of facilitated learning sets over 18 months, at the end of which facilitators (n=4) and practitioners (n=35) were asked to provide reflective feedback on the process, outcomes and overall usefulness of the experience. Questionnaires were sent to each participant inviting reflective feedback and were followed up with a reminder.

**RESULTS**

Eleven learning set groups were formed across four localities assisted by five facilitators (Table 1). A flexible approach to learning set design was taken to allow facilitators the scope to judge how to best meet the needs of the practitioners in the groups. Reflective feedback was provided by four facilitators and only nine participants (Table 2). Forty-three trusts were involved at the start of the process, but this had reduced to 35 by the end of the project. Reasons for dropout included staff moving jobs and trust restructuring. At the end of the project some participants had worked their way through the toolkit and completed a change. Most had worked at least partially through the toolkit. All participant respondents felt attending the learning sets had helped them identify what change was needed and six said it helped identify how to make a change. In the East of England, trusts agreed to collaborate on an activity/skill mix survey using an adaptation of a tool in the toolkit to help participants benchmark their service against others. The participants derived the most value from activities and tools that helped them understand the strategic and organisational environment,
how their service was perceived and the activities that were being undertaken by their staff. The facilitators also valued bespoke tools and found the toolkit a useful framework for supporting the direction of the learning sets. Participants also valued the opportunity to share experiences with peers and support and guidance from facilitators.

**DISCUSSION**

Although the number of responses to participant questionnaires was low and possibly biased to those who valued the experience more highly, all felt that the process of using the toolkit combined with learning sets helped them highlight areas of practice for development and identify changes in practice needed. However, only five out of nine respondents said they had implemented a change. It is not known whether these changes have resulted in any measurable improvements because measurable or quantifiable outcome data was not collected. Facilitators felt if more time had been devoted to planning and implementing changes participants would have been encouraged to work more quickly through the redesign process. The toolkit has subsequently been revised to take account of recent changes in healthcare policy and the feedback from this project. A series of three learning sets have been delivered over a six-month period (September 2010 to February 2011) using a revised format with a greater focus on the change process was safe.

The study showed that a technician referral system slightly reduced the average time taken per day by the pharmacist on each of the wards, and that the process of using the toolkit combined with learning sets helped them highlight areas of practice for development and identify changes in practice needed. However, only five out of nine respondents said they had implemented a change. It is not known whether these changes have resulted in any measurable improvements because measurable or quantifiable outcome data was not collected. Facilitators felt if more time had been devoted to planning and implementing changes participants would have been encouraged to work more quickly through the redesign process. The toolkit has subsequently been revised to take account of recent changes in healthcare policy and the feedback from this project. A series of three learning sets have been delivered over a six-month period (September 2010 to February 2011) using a revised format with a greater focus on the change process was safe.

**REFERENCES**

1. Department of Health. Equity and Excellence: Liberating the NHS. July 2010

### Introducing prescribing standards to improve medicines safety to a hospital in rural Uganda

Oates K, Toop H, Crawley JE
Department of Pharmacy, Countess of Chester Hospital NHS Foundation Trust

**Winner of poster award (see pS2)**

### A project to determine if a new way of delivering clinical pharmacy services can save pharmacist time on the ward

Cerrato M, Pepperrell M, Steel L, Casey S, Howarth N
Pharmacy Department, Southampton University Hospitals NHS Trust (SUHT), Southampton

The NHS is under pressure to deliver £20bn of efficiency savings. Clinical pharmacy is required to contribute to this target and skill mix is being scrutinised as a potential method of reducing staff expenditure while maintaining current standards of pharmaceutical care. Within SUHT, a pharmacist visits every ward daily (Monday to Friday) to review drug charts. Increasing numbers of pharmacist vacancies occasionally means some wards must be allocated to a prioritised service in the following order: new admissions, unstable patients, new items prescribed and discharges. Work by Kings College Hospital demonstrated that a technician referral process was safe.1 A project was therefore developed to test a method of referral from a medicines management technician to a pharmacist to ascertain if this could save pharmacists’ time, on a variety of wards at SUHT.

### Table 1: Average time taken (in minutes) on each ward per day at baseline and during the study by pharmacists (P) and technicians (T)

<table>
<thead>
<tr>
<th>Ward</th>
<th>E3</th>
<th>F2</th>
<th>G6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline Study</td>
<td>172</td>
<td>168</td>
<td>168</td>
</tr>
<tr>
<td>Study</td>
<td>147</td>
<td>176</td>
<td>176</td>
</tr>
<tr>
<td>Pharmacist (P)</td>
<td>96</td>
<td>76</td>
<td>119</td>
</tr>
<tr>
<td>Technician (T)</td>
<td>84</td>
<td>119</td>
<td>119</td>
</tr>
<tr>
<td>Annual cost/saving (£) to the trust to provide the service studied</td>
<td>P. £2,221 saving</td>
<td>P. £1,066 saving</td>
<td>P. £1,333 saving</td>
</tr>
<tr>
<td>Net. £1,888 saving</td>
<td>T. £5,533 cost</td>
<td>T. £2,866 cost</td>
<td>T. £5,798 cost</td>
</tr>
<tr>
<td>Increased cost</td>
<td>Net. £1,180</td>
<td>Net. £4,645</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Average number of patients seen on the ward by pharmacists (P) and technicians (T) at baseline and during the study – overall bed numbers remained constant

<table>
<thead>
<tr>
<th>Ward</th>
<th>E3</th>
<th>F2</th>
<th>G6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline Study</td>
<td>24</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Study</td>
<td>23</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Pharmacist (P)</td>
<td>21</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Technician (T)</td>
<td>19</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>Difference in number of patients seen per day</td>
<td>P. 1 patient less</td>
<td>P. 2 patients less</td>
<td>P. 9 patients less</td>
</tr>
<tr>
<td>T. 2 patients more</td>
<td>T. 16 patients more</td>
<td>T. 14 patients more</td>
<td></td>
</tr>
</tbody>
</table>

### OBJECTIVES

- To assess whether a technician referral system can reduce the amount of time spent on the ward by a pharmacist.
- To assess whether a technician referral system can reduce the number of patients a pharmacist reviews daily.
- To determine which type of ward is best suited to this new way of working.

### METHOD

The data collection took place on specified weekdays between July 2010 and February 2011. Baseline data was collected by Band 5 technicians and Band 7 pharmacists for two weeks on three separate wards. This included the number of patients seen per day on each ward, and the time taken to provide a standard ward service. The three wards included in the study were E3 (an acute cardiothoracic ward, 24 beds), F2 (an emergency orthopaedic ward, 24 beds) and G6 (an acute elderly care ward, 26 beds) at SUHT.

During the study period (four weeks for F2 and G6, 10 weeks for E3), the technician visited every patient on the ward and referred patients to the pharmacist according to specific referral criteria. If the patient was referred to the pharmacist then the technician did not review the patient again until the pharmacist referred them back. This was done by hand using a printed ward handover sheet available on each ward. The pharmacist then visited the ward after the technician, and only reviewed patients who had been referred. Using the same handover sheet, the pharmacist then referred any stable patients back to the technician, for the following day. Data was recorded by hand regarding the time taken on the ward and the number of patients seen each day, by the pharmacist and the technician.

An earlier pilot study on a colorectal surgical ward had tested the use of an electronic handover between pharmacist and technician, but this was deemed to be too time consuming. It was also decided that the referral criteria used in this pilot needed to be made more specific.

### RESULTS

Table 1 shows the time taken by the pharmacists and technicians at baseline and during the study, and the cost or saving associated with providing the service studied. This is based on a 7.5 hour working day, midpoint Band 5 (£30,000) and midpoint Band 7 (£40,000), and includes a 25% on-cost. Table 2 shows the number of patients seen by both staff groups at baseline and during the study.

### DISCUSSION

The study showed that a technician referral system slightly reduced the average time taken per day by the pharmacist on each of the wards, and
Achieving awareness of antibiotic stewardship through trust-wide antibiotic awareness days

Okoli, A*; Chadwick P†; Subudhi C*; Khan C*; Elrouby S*; Scanlan J†

1Department of Pharmacy, 1Department of Microbiology, Salford Royal NHS Foundation Trust (SRFT), Salford, Manchester

This abstract outlines the approach taken by SRFT to promote antibiotic stewardship. Antimicrobial stewardship programmes need to advocate a multidisciplinary culture of shared knowledge in which all healthcare workers involved in antibiotic management understand and support the principles of prudent antibiotic prescribing.1 Successful antimicrobial stewardship programmes rely on co-ordination and collaboration between healthcare professionals to ensure consistency in approach, shared knowledge and widespread dissemination of practice.1 In November 2010 the European Centre for Disease Prevention and Control (ECDC) designated a European Antibiotic Awareness day.2 The focus of the day was antibiotic use in hospitals.

OBJECTIVE

To carry out a range of trust-wide initiatives to highlight the principles of good antibiotic stewardship via a multidisciplinary approach and to assess the preliminary impact on ward round interventions.

METHOD

Two antibiotic awareness days were held, one in November 2010, which coincided with the launch by the ECDC, and another in February 2011. Both days were publicised by letters sent to clinical and nursing leads. The activities carried out on these days are highlighted in Table 1. During the ward rounds pharmacists completed a data collection form to record the number of patients on antibiotics and the number and type of interventions made. The impact on ward round interventions was assessed by examining the number and type of interventions. After the first awareness day, the microbiology, pharmacy and IT departments worked together to make the entry of an “indications” and “stop/review date” mandatory on the trust’s electronic prescribing record (EPR). Work from the first day prompted the writing of “care standards” for both nursing and pharmacy staff which were launched during the second awareness day.

RESULTS

On Day 1, 29 ward rounds were completed by a doctor and pharmacist and on 11 of these rounds a nurse was also present. Of the patients on these wards, 157 were on one or more antibiotics and 153 interventions were made. On Day 2, 28 ward rounds were completed, 19 with a pharmacist and doctor and four were attended by a nurse as well. Of the patients on these wards, 127 were on antibiotics and 38 interventions were made. On Day 1 the most frequent intervention made was to add an indication to the prescription and on Day 2 it was to stop an antibiotic. Figure 1 illustrates, in more detail, the number and types of interventions made during the ward rounds on the antibiotic awareness days.

Table 1 – Initiatives carried out on antibiotic awareness days

<table>
<thead>
<tr>
<th>Interventions and activities</th>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff wore T-shirts promoting Antibiotic Awareness Day</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Screensavers were used on networked computers throughout the trust to highlight the awareness day</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Teams, each consisting of two microbiologists, non-executive directors and a pharmacist, visited all wards to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔ Highlight the day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔ Talk to medical &amp; nursing staff and discuss prescribing issues, where to find antibiotic guidelines and how to use the trust EPR system to order levels etc. for antibiotics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔ Highlight the antibiotic referral process via the trust intranet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔ Provide ECDC handouts on resistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All pharmacists held an antibiotic ward round and met with their ward doctors and nurses to review these patients on antibiotics. Interventions made were recorded, analysed and trends noted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small credit card sized checklists were distributed to clinical staff. These cards included:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔ A prescribing checklist to be used on initiation of antibiotics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✔ An antibiotic review checklist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posters summarising the Trust antibiotic guidelines were distributed around the trust by pharmacists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care standards for pharmacists and nurses were launched and distributed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An allergy poster was launched highlighting which antibiotics should be avoided, which to use with caution and which could be used safely in patients with a penicillin allergy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Types of intervention made during the antibiotic awareness days

REFERENCES

1 Onatade, R., Jagia, S., Chaudhary, I. A study to assess the safety and time-effectiveness of pharmacy technician triage on a gynaecology/surgical ward, Kings College Hospital NHS Foundation Trust Nov 2009, UKCPA Progress in Practice Symposium;18:36

2 The focus of the day was antibiotic use in hospitals.
DISCUSSION
The results of the second day demonstrate that fewer interventions had to be made, possibly due to the impact of the first awareness day. When interventions were made, there were fewer issues around stop/review dates and adding indications. There were also considerably fewer interventions needed to change antibiotics, although the second day highlighted there is still opportunity to work on encouraging IV to oral switches and updating patients’ allergy status.

CONCLUSION
This abstract has highlighted that, in light of the current financial pressures that trusts are experiencing, relatively small measures in promoting antibiotic stewardship can have a large impact on encouraging rational antibiotic use in a relatively short period of time. The success of these awareness days was helped by the support from non-executive directors, senior microbiologists and senior pharmacists. The work from the awareness days will lead into the development of electronic dashboards available on wards so staff can identify how well they are complying with the antibiotic care bundles. Care bundles will include a checklist staff should adhere to when initiating antibiotics and when reviewing therapy during an antibiotic course.

REFERENCES

The pharmacist, the patient and the pre-operative assessment team: working together to improve patient safety

Liggett A, Crawford P
Pharmacy Department, Musgrave Park Hospital, Belfast Health and Social Care Trust, Belfast

Patients from across Northern Ireland undergoing elective surgery at the regional orthopaedic centre, Musgrave Park Hospital (MPH), have their medication histories taken by the anaesthetist/nurse at the pre-operative assessment clinic (POAC). Time constraints at the clinic can make it difficult to take an accurate medication history. The National Patient Safety Agency (NPSA) states that medication errors occur more commonly at time of patient admission to hospital and there are unintentional variances of 30–70% between the medications patients were taking before admission and their prescriptions on admission.1 Early assessment of each patient by a pharmacist ensures the taking of an accurate medicines history, which has been shown to reduce risk.2 The National Confidential Enquiry into Peri-operative Deaths 20022 highlighted that essential regular medicines are not being given to a large number of patients before their operations. An inaccurate medication history at the pre-operative assessment stage can lead to medication incidents when patients are admitted for surgery due to regular medicines accidentally omitted from the medicine Kardex. Pharmacist input would help reduce medication errors on patient admission to hospital and move towards the introduction of robust pre-operative assessment as outlined in “Priorities for action 2008/09.”3 A previous audit on medication incidents at ward level on this site in 2006 identified inaccurate medication histories as a source of medication errors when patients are admitted to hospital.1

OBJECTIVES
Existing orthopaedic clinical pharmacy services at MPH were evaluated in April 2009 by the clinical pharmacy team after liaising with POAC. The aims of introducing a clinical pharmacist service to the pre-op assessment unit were to:

- Assess the accuracy of the POAC medication history
- Reduce medication incidents on patient admission to hospital due to inaccurate medication histories.
- Reduce workload of pharmacists, nurses and anaesthetists at ward level.

METHOD
Medication histories were taken on the orthopaedic surgical wards by clinical pharmacists on 158 patients before and after the introduction of a pharmacist at POAC. To remove bias medication histories taken before were taken by the proposed POAC clinic and those after were taken by the regular ward pharmacist. A staff survey was conducted to assess opinions of the new service. POAC nursing staff, anaesthetists, ward based physicians and clinical pharmacists were surveyed.

RESULTS
POAC medication histories were found to be inaccurate in 96 cases over a two-month period without pharmacy input compared to eight with pharmacy input, a 92% reduction (Table 1). A total of 302 inaccuracies were recorded before the introduction of a pharmacist. The top two reasons for an inaccurate POAC medication history were incorrect or omitted frequency of administration (n = 91) and medicine omitted from medication history (n = 84). A total of 142 medicines incidents were recorded on admission without pharmacy input compared to 43 with pharmacy input. There was a 100% reduction in the number of medicines incidents occurring due to an inaccurate POAC medication history (Table 2).

Asked if the introduction of a pharmacist had reduced their workload, 13/16 (81%) of survey respondents answered positively. For the first two months of the financial year 2008/09, one surgical procedure was cancelled due to inappropriate medication use; this compared to five procedures over the same period the previous year, i.e., a reduction of 80% after the introduction of POAC pharmacist.

DISCUSSION
The introduction of a pharmacist to the POAC has shown a benefit to patient safety and helped to reduce the workload of both POAC and ward based staff. The project won first prize as a patient safety initiative in the Belfast Trust Chairman’s awards 2009. The use of a dedicated POAC medication history form has also helped to lay the groundwork for the introduction of medicines reconciliation. The decrease in pharmacist workload at ward level has allowed them to focus on inpatient medication review and discharge prescription planning. POAC staff and ward based physicians felt the introduction of a pharmacist allowed them to focus on patient care. The impact on medicine incidents noted during the audit will continue to be monitored through the existing clinical pharmacy framework and it is hoped that the pre-operative role will form part of the clinical rotation or all team members. In future it is hoped to develop an interface with the current electronic discharge prescription system in operation in MPH to allow a medication history to be entered electronically at the POAC and retrieved on admission.

<table>
<thead>
<tr>
<th>Table 1: Inaccurate POAC medication histories before and after the introduction of a pharmacist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inaccurate POAC medication history</td>
</tr>
<tr>
<td>Number before</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Reasons for medicines incidents occurring on admission before and after introduction of a clinical pharmacist to POAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason</td>
</tr>
<tr>
<td>Number before</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>Inaccurate POAC medication history</td>
</tr>
<tr>
<td>Inaccurate transcribing of POAC medication history at ward level</td>
</tr>
<tr>
<td>Changes to patient’s medicines after attending POAC</td>
</tr>
<tr>
<td>Total medicines incidents on admission</td>
</tr>
</tbody>
</table>

Table 1: Inaccurate POAC medication histories before and after the introduction of a pharmacist

Table 2: Reasons for medicines incidents occurring on admission before and after introduction of a clinical pharmacist to POAC
Improving inpatient access to appropriate, safe and timely medication: Development of a scope of practice for pharmacist independent prescribers

St Clair Jones A, Warren A, Pettit M, Harchowal J
Brighton and Sussex University Hospitals (BSUH) NHS Trust

Traditionally pharmacist independent prescribers (IPs) work in specialist clinics, such as oncology, renal and cardiology, or prescribe for a defined inpatient cohort. The BSUH protocol for non-medical prescribers1 states clearly that the independent and supplementary prescriber must have the agreement from the medical consultant in charge of the case to prescribe for his/her patients. This requirement prevented the IPs in areas with multiple specialties and high number of consultants such as the division of surgery to effectively use their skills. In addition the need to deploy staff to cover vacancies and leave requires pharmacists to cover wards outside their scope of practice for pharmacist IPs would be able to practise in our trust, labelled general level and specialist level:

OBJECTIVE
To develop and evaluate an IP Scope of Practice for BSUH reflecting the different areas of Pharmacist IP prescribing identified.

METHOD
After an extensive literature review and consultation with outside IP networks (RPharms, UKCPA), current BSUH non-medical prescribers (including pharmacist IP prescribing for inpatients) and consultants our Scope of Practice for Pharmacist Independent Prescribers was developed. A two-level approach was identified reflecting the two distinct settings where pharmacist IPs would be able to practise in our trust, labelled general level and specialist level:

- The general level incorporates predictable minor and self-limiting conditions associated with acute hospital inpatient care and medicines reconciliation. It is used for patients under any consultant’s care trust-wide.
- The specialist level reflects the specific areas a specialist IP is able to prescribe for a selected patient cohort with the agreement of the consultant in charge of the case.

This scope of practice was considered a significant change of practice that required approval and sanctioning by the trust. An evaluation of the scope reflecting prescribing areas identified was undertaken by analysing the first 50 prescriptions according to the conditions prescribed for.

RESULTS
The general level scope of practice enables each IP to prescribe according to their professional judgment of the patient’s clinical needs and shows only examples of prescribing areas, whereas the specialist level scope of practice is very specific in stating therapeutic conditions and medications prescribed (see Table 1).

Despite intensive discussions the trust’s non-medical prescriber committee felt the scope was beyond its remit to sanction. The medicines management committee was unable to come to an agreement to approve the scope of practice on behalf of the trust. The proposed scope was then presented by the chief pharmacist to the trust board achieving unanimous approval which allowed implementation of general level pharmacist independent prescribing for all BSUH inpatients without the explicit approval of each consultant.

The scope of practice was piloted on surgical wards including a digestive diseases ward by one IP. Initial results of the first 50 prescriptions are shown in Table 2. 92% of prescribed items were covered by the general level of the scope including 50% of medicines reconciliation activity. The findings are supported by a reanalysis of a previous inpatient prescribing audit by the cardiac pharmacist showing 80% of prescriptions falling into the general level. The IP specialist area is gastroenterology which accounts for the 8% of specialist prescribing such as continuation of viral hepatitis prescriptions. The three prescriptions under “other” were indications at general level but not specifically listed in the general level scope of practice such as moisturisers in psoriasis and vaccinations after splenectomy.

DISCUSSION AND RECOMMENDATIONS
The two-level approach to the scope of practice for pharmacist IP prescribers proved to be a practical and comprehensive solution to independent prescribing which benefits all patients and enhances the IP role in the MDT. IP prescribing improves patient access to medicines and the preliminary work indicates the valuable contribution of the general level scope of practice as it enables timely, safe prescriptions (and supply) without direct reference to medical teams each time. It allows the trust to comply with NICE and NPSA guidance2 in a timely fashion and supports the case for increased numbers of pharmacist IPs at general level with or without specialist remit. The low proportion of specialist prescribing reflects the nature of the pilot site and would be expected to vary from one speciality to another.

The pharmacy department needs to further investigate the qualitative and quantitative contributions and outcomes and explore the consultants’ satisfaction level with pharmacist IP prescribers. The general level is an extension of the role for IPs and considerations need to be given to

### Table 1: Examples of areas of prescribing

<table>
<thead>
<tr>
<th>Condition/area of prescribing</th>
<th>Number of prescriptions</th>
<th>Percentage of prescriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist prescribing</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>TOM</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td>Medicine reconciliation</td>
<td>25</td>
<td>50%</td>
</tr>
<tr>
<td>Prescription reviews</td>
<td>11</td>
<td>22%</td>
</tr>
<tr>
<td>Clostridium Difficile</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Table 2: Evaluation of first 50 prescriptions

<table>
<thead>
<tr>
<th>Condition/area of prescribing</th>
<th>Number of prescriptions</th>
<th>Percentage of prescriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>General level scope of practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist level scope of practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIV, PONV, CINV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VTE prophylaxis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose adjustment in renal and hepatic impairment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple analgesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncomplicated UTI in women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constipation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xerophthalmia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple bacterial or allergic conjunctivitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-infective diarrhoea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicines reconciliation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clostridium difficile</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### REFERENCES
Portfolios review and standardisation for preregistration pharmacist trainees

Hollister A, McDonald J
Oxford Radcliffe Hospitals NHS Trust

Preregistration training is the term used to describe the work-based experience that graduates holding a master of pharmacy degree (MPharm) must complete prior to registration with the General Pharmaceutical Council (GPhC) as a pharmacist. During this work-based experience, a preregistration trainee must build a portfolio of evidence over a period of 12 months to demonstrate proficiency against a series of performance standards (PS) as defined by the GPhC. This portfolio is assessed by a preregistration tutor (PRT) at 13-week intervals to assess progress. At a time when both quality and value for money must be demonstrated, a need to quantify the expectations of individual tutors when reviewing portfolios was identified.

OBJECTIVES

- To determine whether the quantity and type of evidence provided by trainees across different trusts is broadly similar at progress reviews 2 and 3.
- To calculate how often, on average, a trainee needs to claim a PS before being deemed competent.
- To identify whether the regional tutor guidance for signing off evidence is being followed.
- To analyse five random pieces of evidence at two data collection points for each trainee to ascertain whether the investigators concur with the PS agreed by the tutor.

METHODS

Data was collected, across five acute trusts, in two phases: portfolio review and standardisation of evidence. Data collection occurred at two points during the preregistration year: at 26 weeks (PR 2) and at 39 weeks (PR 3). During portfolio review, a standardised data collection form was used to collect demographic data including: (i) the number of evidences submitted by a trainee at PR2 & PR3; (ii) the number of each type of evidence submitted; (iii) the number of times a trainee claimed any PS; (iv) how many PS claimed by the trainee were agreed by the tutor; (v) how many of the PS claimed by the trainee were accepted by the PRT; and (vi) how many PS claimed by the trainee were considered to have been adequately demonstrated by the PRT.

RESULTS

Twenty-two trainees based in five NHS hospitals participated in the study. They submitted an average of 40 pieces of evidence prior to PR2 and 37 pieces of evidence prior to PR 3. The average and range of pieces of evidence submitted at each hospital is shown in Table 1.

<table>
<thead>
<tr>
<th>Trust</th>
<th>Number of PS claimed</th>
<th>Number of PS agreed by tutor</th>
<th>Number of PS agreed by investigator</th>
<th>Number of PS claimed</th>
<th>Number of PS agreed by tutor</th>
<th>Number of PS agreed by investigator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>217</td>
<td>79</td>
<td>161</td>
<td>225</td>
<td>118</td>
<td>204</td>
</tr>
<tr>
<td>2</td>
<td>150</td>
<td>142</td>
<td>136</td>
<td>214</td>
<td>206</td>
<td>201</td>
</tr>
<tr>
<td>3</td>
<td>334</td>
<td>300</td>
<td>299</td>
<td>433</td>
<td>185</td>
<td>347</td>
</tr>
<tr>
<td>4</td>
<td>208</td>
<td>82</td>
<td>178</td>
<td>182</td>
<td>135</td>
<td>152</td>
</tr>
<tr>
<td>5</td>
<td>133</td>
<td>0</td>
<td>91</td>
<td>124</td>
<td>92</td>
<td>105</td>
</tr>
</tbody>
</table>

DISCUSSION

This study demonstrated some variation in the quantity of evidence written by trainees, the type of evidence submitted and the number of times a PS was demonstrated before being signed off by a tutor. This questions whether the guidance for tutors is adequate to ensure sufficient evidence is provided without too much leading to wheelbarrow syndrome.\(^1\)

The study also showed that compliance with regional standards for assessing evidence was low and variations existed in PS claimed by the trainee that were considered to have been adequately demonstrated by the tutor and the investigators. One explanation may have been assumptions which had to be made due to poor compliance with the assessment standards. One limitation that was recognised was that tutors assessing evidence have the option of discussion with the trainee which was not available to the investigator.

Further work is needed to establish how the variations observed impact on the final outcome, ie, registration as a pharmacist and to identify what additional support needs of tutors.

REFERENCES

Reducing the risk of delayed or omitted medicines

Ade-Ojo B, McDonald J, Omon-Anolu O
Pharmacy Department, Milton Keynes Hospital NHS Foundation Trust

Medication errors are any incident where there has been an error in the process of prescribing, dispensing, preparing, administering, monitoring or providing medicines advice, regardless of whether any harm occurred or was possible.1 When medication doses are omitted or delayed in hospital this may or may not be considered to be an error. While many instances may not seem serious, for some critical medicines or conditions, delays or omissions can cause serious harm or death. Between September 2006 and June 2009, the National Patient Safety Agency (NPSA) received reports of 27 deaths, 68 severe harms and 21,383 other patient safety incidents relating to omitted or delayed medicines.2 These figures demonstrate the need for omitted or delayed doses to be taken seriously.

OBJECTIVES

- To document the rate (%) of dose omission as a proportion of total prescribed doses
- To compare the rate (%) of dose omission with previous studies
- To make interventions aimed at reducing the proportion of omitted doses
- To measure the impact of interventions on the rate (%) of dose omission
- To review in detail the omission rate (%) for ‘critical’ medicines

METHODS

Preliminary data were collected across nine medical wards and five surgical wards for a period of four weeks using a predesigned and piloted data collection tool. Prescription charts were selected based on their availability on the ward on the day the data collection was carried out. For each drug chart, all drugs prescribed under “regular medication”, all omitted doses, and their reasons (if documented) were recorded. The findings were presented at a trust wide audit meeting.

Follow-up data was collected across eight medical wards and five surgical wards for a period of two weeks following the interventions being introduced. Five prescription charts were randomly selected on each ward. For each drug chart the total number of regular doses prescribed and the total number of doses omitted were recorded. The critical medicines omitted and the reasons for those omissions were also documented.

RESULTS

During the second collection period when critical medicines were reviewed in more detail, 193 / 943 (17%) doses of critical medicines were missed. Of the critical medicines omitted 31.6% were cardiovascular medicines, 21.8% were anti-infective agents, 12.9% were bronchodilators, 10.4% were anticoagulants and 9.3% were anticonvulsants.

DISCUSSION

The preliminary data collection in 2007 and 2009, shown in Table 1, demonstrated cause for concern with omission rates of 14% and 11%, respectively. The higher omission rate on surgical wards may have been due to patient refusal when offered analgesics or laxatives that were no longer needed.

Following the release of the NPSA alert,2 a list of critical medicines, shown in Table 2, was established. This supported a number of interventions designed to raise the profile of omitted doses and highlight at the point of administration medicines which must not be delayed.

The data collected in this study, also shown in Table 1, illustrated a general improvement in the rate of omitted or delayed doses at 8.7%.

Table 1: Omission rates (%) for both data collection periods

<table>
<thead>
<tr>
<th>Year</th>
<th>Sample size</th>
<th>Number of doses prescribed</th>
<th>Number of doses omitted</th>
<th>Omission rate (%)</th>
<th>Percentage of omissions not documented</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>138</td>
<td>5,980</td>
<td>841</td>
<td>14%</td>
<td>44%</td>
</tr>
<tr>
<td>2009</td>
<td>196</td>
<td>9,406</td>
<td>1,041</td>
<td>11%</td>
<td>29%</td>
</tr>
<tr>
<td>This study</td>
<td>70</td>
<td>3,885</td>
<td>369</td>
<td>9%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Although this study had a smaller sample size, it would seem to suggest a trend in the right direction and a favourable result compared to other similar data where omission rates of 10%5 and 19.6%6 have been reported.

Of most concern is the apparently increased level of dose omission among critical medicines seen in the follow-up data collection period. Both the level and nature of the omitted doses suggest the need for further work to improve this situation.

Acknowledgements: The authors would like to acknowledge the contributions of Vicky Ho and Ravi Patel, the undergraduate students whose data collection formed the initial part of this work.

REFERENCES

4 McDonald J, Ho V, Patel R. Audit of Missed Doses within the Medical & Surgical Directories at Milton Keynes Hospital NHS Foundation Trust. July 2009.
5 Dobranski S. Omitted Doses at Bradford Teaching Hospitals. (accessed 28 February 2011)

Applying systems mapping to clinical pharmacy to identify service improvement opportunities

Wilkes G
Nottingham University Hospitals NHS Trust, Nottingham

The pharmacy department at this large university teaching hospital has set itself a target to be among the leading clinical pharmacy service providers in Britain within five years. To realise this aspiration, rapid and substantial improvement is required within the ward-based element of the clinical service. Systems mapping is used alongside lean manufacturing concepts to study and analyse processes. Such techniques have been used within manufacturing, and an increasing range of other industries, to enable service improvement with great success.

OBJECTIVE

This study was established to determine whether the use of system mapping can be applied to ward-based clinical pharmacy services to support a service improvement programme through the identification of opportunities and the development of improvement solutions.

METHOD

During December 2010, four workshops were convened to prepare a current state value stream map of ward-based clinical pharmacy services.
Workshop participants represented the full range of pharmacy staff groups from a variety of practice environments. Mapping began by identifying the process flow associated with each patient episode. The interactions between pharmacy services and the process flow were identified. The procedural time assigned to specific tasks was added to the map to understand how the daily workload was planned.

Direct observation was used to gather data about current practice, including cycle times, staff allocation and equipment. To offset observational bias, data was cross-checked with other sources, studies and external comparisons. Findings were confirmed by workshop participants. Direct questioning and conversation was used to elicit the views of staff involved in each element of the process. The attitudes of a selection of doctors, nurses and patients to the pharmacy service were surveyed using relevant tools.

Workshop participants analysed the value stream map. They identified elements of work that added value and elements that did not add value to the process flow. Opportunities for improvement began to emerge. These were grouped into themes and prioritised according to the likely impact changes could have on achieving our departmental aspirations. Four further workshops were convened to address these themes in a future state map. The future state map showed new ways of working, minimising non-value added work and reducing waste. Once designed, the future state map was refined by an expert working party, formed from within the larger DEPS group used all the available frameworks and resources on the process, it became clear that terminology used for pharmacy tutors needed to be clarified. The “Time for training” report reviewed the impact of the European Working Time Directive on the training of doctors, dentists and pharmacists. Although the findings were most relevant to medicine, the principles can equally be applied to pharmacy and dentistry. The report specifically emphasises the need for all trainers to be trained, accredited and supported as well as having their roles recognised and rewarded.

The governance of education and training standards in the pharmacy profession is becoming more robust. The “Time for training” report reviewed the impact of the European Working Time Directive on the training of doctors, dentists and pharmacists. Although the findings were most relevant to medicine, the principles can equally be applied to pharmacy and dentistry. The report specifically emphasises the need for all trainers to be trained, accredited and supported as well as having their roles recognised and rewarded.

Autumn 2009 saw the formation of a local working group, DEPS (Developing Educational and Practice Supervisors in pharmacy), in south-east UK to create an accreditation and QA framework for all pharmacy practitioners involved in facilitating and supervising learning in the workplace. This group included service managers, pharmacy tutors, academics and trainees as well as representing both hospital and community pharmacy.

The Advanced to Consultant Level Framework (ACLF) embraced by the pharmacy profession has one section dedicated to “Education, training & development”, which broadly addresses education within pharmacy. This is suitable as an overarching education framework, but does not focus on the specific roles of tutors in the pharmacy profession. The DEPS framework has been specifically created for the role of tutors in our workplace based profession. The DEPS framework is a tool to help a tutor become an advanced level practitioner, with extensive mapping to the ACLF. Strong links between the frameworks are supported by their similarity in structure (1 (Foundation), 2 (Advanced) and 3 (Mastery)).

The DEPS group used all the available frameworks and resources on tutoring in pharmacy and related professions to explore the qualities and characteristics of tutors within pharmacy. Through this collaborative process, it became clear that terminology used for pharmacy tutors needed to be clarified. Three “tiers” of pharmacy tutors were identified, with carefully selected terms that would be familiar to the medical and other health professions. Using common terminology will help pharmacy “strategically align” with other health professions.

Due to the sheer volume of information produced by this undertaking, an external concept mapping exercise was commissioned to theme the results and create an initial framework. The framework was then reviewed and refined by an expert working party, formed from within the larger DEPS group before being reviewed by all members.

To ensure that the framework was broadly in line with perceptions of the wider pharmacy community of pharmacy tutoring roles, conversations were held throughout the process with the Royal Pharmaceutical Society and pharmacy peers in Wales.

Three tiers of pharmacy tutor were identified: the practice supervisor (PS), the educational supervisor (ES) and the educational programme director.

### Table 1: Value associated with current clinical pharmacy practice

<table>
<thead>
<tr>
<th>Pharmacy interaction with process flow</th>
<th>Pharmacy contributions to care</th>
<th>Alignment with expectations of service user (doctor, nurse or patient opinion)</th>
<th>Clinical pharmacists’ views on performing activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicines reconciliation</td>
<td>24%</td>
<td>Net expectation</td>
<td>Tedious, poor use of my time</td>
</tr>
<tr>
<td>Review of inpatient prescribing</td>
<td>40%</td>
<td>Exceeded expectation</td>
<td>Feel valued as part of clinical team</td>
</tr>
<tr>
<td>Advise on administration and monitoring</td>
<td>14%</td>
<td>Net expectation</td>
<td>Good use of time</td>
</tr>
<tr>
<td>TTO processing</td>
<td>9%</td>
<td>Below expectation</td>
<td>Time consuming and frustrating</td>
</tr>
<tr>
<td>Patient counselling</td>
<td>3%</td>
<td>Below expectation</td>
<td>Nice to do, if time allows</td>
</tr>
</tbody>
</table>

### RESULTS

The value stream map was a powerful tool for building consensus on the changes that should be made, and challenge historical and hierarchical views. It brought together qualitative and quantitative data about current practice, some of which is shown in Table 1.

Several opportunities for improvement were identified. The key themes were the use of skill mix, simplification of pharmacy processes, level of service provision, configuration of pharmacy teams, devolution of responsibility and staff allocation.

### DISCUSSION

The visual collation of data from direct observation and other sources alongside the process flow enabled a comprehensive review of ward-based activities and facilitated the identification of sources of waste. The method was distinctly different from traditional problem solving methods used within the department, which tended to rely on descriptions of practice from managers. It enabled a clear consensus to be reached on the improvement opportunities. These could be easily explained to managers, and the evidence that had lead to the conclusions was difficult to contradict.

The process effectively engaged a wide range of pharmacy staff and facilitated the initiation of several projects. The outcomes that are anticipated from these projects include an improvement in clinical outcomes through an increase in pharmacy contributions to care, an improvement in staff satisfaction, reduction in waiting times, improved staff satisfaction and the freeing up of senior pharmacists for redeployment.

### REFERENCES


### Developing educational and practice supervisors in pharmacy

Wright E, Fleming G
South East Medicines Management Education and Development (SEMMEd), Horley

The objective of the DEPS group was to produce a framework that could be used to accredit and quality assure any pharmacy practitioner involved in facilitating or supervising learning the workplace.

### OBJECTIVE

The DEPS group used all the available frameworks and resources on tutoring in pharmacy and related professions to explore the qualities and characteristics of tutors within pharmacy. Through this collaborative process, it became clear that terminology used for pharmacy tutors needed to be clarified. Three “tiers” of pharmacy tutors were identified, with carefully selected terms that would be familiar to the medical and other health professions. Using common terminology will help pharmacy “strategically align” with other health professions.

Due to the sheer volume of information produced by this undertaking, an external concept mapping exercise was commissioned to theme the results and create an initial framework. The framework was then reviewed and refined by an expert working party, formed from within the larger DEPS group before being reviewed by all members.

To ensure that the framework was broadly in line with perceptions of the wider pharmacy community of pharmacy tutoring roles, conversations were held throughout the process with the Royal Pharmaceutical Society and pharmacy peers in Wales.

### RESULTS

Three tiers of pharmacy tutor were identified: the practice supervisor (PS), the educational supervisor (ES) and the educational programme director.
Pharmacy “huddles” — a service evaluation

Rochester S, Harper L, Burgin A, Silverthorne J
Salford Royal NHS Foundation Trust, Salford

Healthcare research has shown that teamwork and good communication between professionals can improve the quality of patient care and patient safety and reduce medical errors. Moreover, people who work in a team have a higher degree of job satisfaction.

The Department of Health’s initiative, “The productive ward: releasing time to care”, aims to help wards recognise areas for improvement by giving staff the appropriate information and skills, allowing them to take responsibility for the care they provide.1 The productive ward series consists of 11 modules, one of which requires staff to introduce weekly review meetings, known as “huddles”. The huddle allows a weekly progress review and helps promote teamwork and communication. The initiative was first introduced to the trust in February 2009. The principal clinical pharmacist introduced the huddle to the pharmacy department in April 2009 after witnessing their success at ward level. The aim of the pharmacy huddle is to improve communication and teamwork between pharmacists.

OBJECTIVES

● Identify the opinions of pharmacists about information sharing pre and post huddle introduction
● Identify the perceived benefits pharmacists gain from attending the huddles
● Identify the current disadvantages of the huddles
● Highlight improvements that could be made for future huddles

METHOD

A self-completion questionnaire was used to collect pharmacists’ opinions about the pharmacy huddles. The questionnaire content was based on two interviews with senior staff members who helped implement the huddles and was amended following feedback from the project supervisor. All pharmacists were invited to take part and provided with participant information sheets and questionnaires (n=41). The latter were returned via a collection box. Analysis of the data was conducted thematically for the free text and with descriptive statistics for the quantitative data.

RESULTS

Completed questionnaires were returned by 27 (68%) pharmacists, of whom 13% (n=9/27) had joined the trust after April 2009. The perceptions of respondents regarding communication and teamwork before and after implementation of the huddles is shown in Figures 1 and 2, respectively. When asked what the most useful aspect of the huddle was, 82% (n=22/27) of pharmacists rated the communication of weekly staffing issues as most useful. It was noted that 42% (n=11/27) of participants felt that the least useful aspect of the huddles was discussing discharge prescription turnaround times. The main disadvantage of the huddles was the time they take in the morning (n=11/27, 42%), which was longer than 10 minutes.

Other comments, from 57% of pharmacists (n=15/27), were that they...
would like to include technical staff or dispensary issues, with 25% (n=7/27) commenting that other trusts’ departmental meetings included all staff. Other suggested improvements included shorter meetings (14%, n=4/27) and increased frequency (11%, n=3/27).

DISCUSSION

The results indicate that the huddles have had a statistically significant (p=0.009) effect on the communication between pharmacists, hence achieving one of their original aims. The communication of rota and staffing problems increased from fairly poor to very good, and were identified as the most useful aspect of current pharmacy huddles.

Although not statistically significant, results suggest that teamwork between pharmacists and communication within the department have improved secondarily to the pharmacy huddles. It was felt that pharmacy huddles have had limited impact on the effect of departmental teamwork.

To try to improve this, 57% (n=15/27) supported the incorporation of technicians into the huddles.

The main disadvantage of the pharmacy huddles was the time they required on Monday and Friday mornings. To try and improve this, certain agenda items have been switched to a fortnightly or monthly report.

REFERENCES


Evaluation of patient satisfaction from warfarin counselling received prior to hospital discharge

Wong M*, McCabe M1, Elliott P†

†Pharmacy Department, Wirral University Teaching Hospital, Wirral; 1School of Pharmacy and Biomedical Sciences, Liverpool John Moores University, Liverpool

The National Patient Safety Agency (NPSA) alert on “Actions that can make anticoagulant therapy safer” suggests that patients prescribed anticoagulants should receive appropriate verbal and written information at the start of therapy and upon discharge from hospital. Between 2004 and 2005, 699 patient safety incidents relating to warfarin were reported to the NPSA with omitted or wrong dose taken being the most frequently reported incident. In response to the NPSA alert, Wirral Hospital Trust produced a standard operating procedure on “Dealing with prescriptions for oral anticoagulants”, which clearly states that warfarin counselling must be provided prior to hospital discharge. Ward pharmacists usually provide interactive bedside warfarin counselling outlining information contained in the oral anticoagulant therapy (OAT) booklet. Wirral Hospital Trust has recently introduced a warfarin counselling DVD which is available on the patient’s bedside television for viewing.

OBJECTIVE

To assess patients’ satisfaction with the methods for providing information about warfarin described in the introduction.

METHOD

The trust’s electronic prescribing system was used to identify all inpatients newly started on warfarin over a five-week period. Patients were issued a questionnaire to assess their satisfaction with the warfarin counselling received, either on the wards (24 hours after initiation) or at the first anticoagulant clinic appointment which was within one week after discharge. The questionnaire asked the patients to score each method of warfarin counselling using the Likert scale (1 the least satisfied and 5 the most satisfied) and state whether they had received adequate information on each section outlined in the OAT booklet. The questionnaire was anonymous. Ethics approval was unnecessary as the audit did not affect patient care during this episode.

RESULTS

Forty questionnaires (100% response) were completed, 21 by males and 19 by females. The age range was from 23 to 86 years, with a mean age of 64 years. The proportion of patients counselled with each method and their satisfaction scores are detailed in Table 1: 72.5% (29/40) of patients received all three methods of counselling; 22.5% (9/40) of patients received bedside counselling and OAT booklet; 5% (2/40) of patients received warfarin counselling DVD and OAT booklet. Table 2 summarises the patients’ views on clarity of information provided during warfarin counselling.

DISCUSSION

All patients received both written and verbal information on warfarin treatment prior to discharge as per NPSA recommendations. The average satisfaction scores for each method were similar and indicate patient satisfaction with all three methods. Warfarin counselling DVD may be considered as a supplement to the bedside counselling. Patients can watch the warfarin counselling DVD, read the written information from OAT booklet and followed up by the pharmacist if the patient has further questions. The pharmacist can also ensure that the patients understand the information. This would reduce the time required for the counselling.

Table 1. Proportion of patients receiving each counselling method and the associated average satisfaction scores

<table>
<thead>
<tr>
<th>Methods of counselling</th>
<th>Percentage of patients</th>
<th>Average satisfaction scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedside interactive counselling</td>
<td>95% (38/40)</td>
<td>4.8</td>
</tr>
<tr>
<td>Warfarin counselling DVD</td>
<td>77.5% (31/40)</td>
<td>4.7</td>
</tr>
<tr>
<td>OAT booklet</td>
<td>100% (40/40)</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Table 2. Clarity of information provided during warfarin counselling

<table>
<thead>
<tr>
<th>Information</th>
<th>Yes and clear</th>
<th>No or not clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of treatment</td>
<td>72.5% (29/40)</td>
<td>27.5% (11/40)</td>
</tr>
<tr>
<td>Food interactions</td>
<td>82.5% (33/40)</td>
<td>17.5% (7/40)</td>
</tr>
<tr>
<td>Where to attend for international normalised ratio (INR)</td>
<td>85% (34/40)</td>
<td>15% (6/40)</td>
</tr>
<tr>
<td>Consequence of out of range INR</td>
<td>87.5% (35/40)</td>
<td>12.5% (5/40)</td>
</tr>
<tr>
<td>Target INR/administration errors/side effects/ medication interactions</td>
<td>92.5% (37/40)</td>
<td>7.5% (3/40)</td>
</tr>
<tr>
<td>Dose adjusted on INR results</td>
<td>95% (38/40)</td>
<td>5% (2/40)</td>
</tr>
<tr>
<td>INR monitoring/Action of warfarin/ excess alcohol</td>
<td>97.5% (39/40)</td>
<td>2.5% (1/40)</td>
</tr>
<tr>
<td>Time of administration/Different strengths tablets</td>
<td>100% (40/40)</td>
<td>0%</td>
</tr>
</tbody>
</table>
A survey to evaluate patient satisfaction with outpatient services at a hospital pharmacy department

Hodson KL*, Blackburn-Smith J*, Way C†, Sutton C†, Hughes E†
*Cardiff University, Cardiff; †Cardiff and Vale University Health Board

Patient satisfaction is widely used within healthcare research for the purposes of service evaluation.1 University Hospital Llandough (UHL) is one hospital within Cardiff and Vale University Health Board that is currently developing its outpatient pharmacy services using LEAN methodology linked in with patient satisfaction measures. LEAN methodology is an efficiency tool aimed at improving flow and eliminating waste and variation.2 Although other projects within the University Health Board were outlining potential areas for LEAN analysis, there was no data on what areas of the outpatient pharmacy services patients valued most and what areas caused them concern. The aim of the study was therefore to evaluate the outpatient service provided by the hospital from the patients’ perspective and to identify areas for improvement.

OBJECTIVES

- To evaluate patient satisfaction with the outpatient pharmacy service
- To identify what users of the service valued when visiting the outpatient pharmacy with a prescription
- To identify any concerns the patients had and to identify ways in which patients and/or carers believed these concerns could be addressed

METHOD

The NHS Research Ethics Committee deemed the project to be service evaluation. A cross-sectional survey was designed based on the findings from initial information gathering observations undertaken in the hospital’s outpatient pharmacy and adapting a questionnaire which had previously been used when the hospital automated dispensing had been implemented.1

A questionnaire was developed, containing a mixture of open and closed questions. The different sections of the questionnaire included:

- Ease of finding the pharmacy department and dispensing times
- Advice given to the patient and the time with pharmacy staff
- Availability of medicines and stock
- The waiting area and the pharmacy itself
- Overall satisfaction with the pharmacy department (using a five-point Likert scale)
- Demographic data on the patients

All patients who were dispensed an outpatient pharmacy prescription, except those who attended the memory clinic, were under 18 years and where the name, address or age was unclear on the prescription were included in the study. A piloted questionnaire, covering letter and freepost return envelope were sent to all eligible patients, no more than three days after they had attended the hospital, during a two-week period. All participants were given 10 days in which to respond, after which time the data was inputted and analysed using Statistical Package for Social Sciences (SPSS) version 16.

RESULTS

Of the 502 questionnaires distributed, 19 were returned ineligible as they had not attended the outpatient pharmacy. A response rate of 34% was obtained (n=163/483). The majority of respondents were female (58%, n=95/163), and aged over 50 years (72% n=118/163). The demographics illustrated that the main user of the pharmacy was a retired female aged 70–79 years. The majority of respondents collected their own prescription (90% n=144/160).

A fifth of respondents (n=33/161) reported difficulty in finding the pharmacy department, this was unrelated to their age. Sixty-seven per cent of respondents (n=110/163) were approached by a member of pharmacy staff within two minutes; however, about half (48% n=78/163) of respondents were not given any indication of how long they would be required to wait for their prescription. The majority of respondents (94%; n=152/162) indicated they would like to receive their medicines within 15 minutes. Approximately 60% (n=96/160) of respondents were counselled on their medicine; of those not counselled approximately half (54% n=33/61) were for new medicines.

Thirteen per cent of respondents (n=21/162) indicated that their medicine was unavailable at the time of dispensing and of these just over half (52% n=11/21) reported they were unhappy with the arrangements that were put in place to receive the remaining medicines. With respect to the pharmacy waiting area, two-thirds (n=107/161) agreed it was comfortable, while only 30% (n=48/161) thought there was enough privacy. Approximately 70% (n=110/161) of respondents rated the pharmacy service as excellent or good, with only 5% (n=8/161) rating it as poor. The main suggestions for improvement included a bigger waiting area, having better signage to the department and a private area.

DISCUSSION

Although the response rate of 34% limits the representativeness of the results to the whole population, the study highlighted several key findings that the hospital could use in its application of LEAN analysis to develop its outpatient pharmacy service.

It was encouraging that the overall satisfaction with the service was rated good or excellent. However, there were several areas for concern including the waiting area, accessibility of the department itself, lack of some medicines and a seemingly lack of standard approach to taking in outpatient prescriptions and information provision to patients on their medicines.

The results of the survey have been shared with pharmacy staff undertaking a service improvement project. In response, the signage to the pharmacy from the outpatients department has been improved and procedures put in place to inform patients of waiting times for prescriptions. The turnaround times are monitored monthly and the information is displayed in the waiting room. Bids have been submitted for funding to create a private room, adjacent to the waiting area, where patients can discuss their medication with pharmacy staff. Work to ensure that sufficient stock is available to complete all prescriptions is ongoing. The survey has motivated the staff to meet patients’ expectations. A follow-up survey to assess patients’ views of the changes is planned.

REFERENCES

RESEARCH

An evaluation of non-medical prescribers’ continuing professional development (CPD) needs

Moore S, Hodson KL
Cardiff University, Cardiff

In Wales, nurses and pharmacists have been able to qualify as supplementary and independent prescribers since 2004 and 2007, respectively. The Welsh Assembly Government’s guide to implementing non-medical prescribing in Wales states that they must all have a responsibility to keep up to date and demonstrate CPD in their prescribing area. In 2009, Cardiff University established a task and finish group due to concerns being raised about a possible lack of CPD provisions for non-medical prescribers. As a result, the aim of this study was to identify the CPD requirements of non-medical prescribers in South-East Wales.

OBJECTIVES

- To identify how CPD is currently being met by non-medical prescribers and to discover the specific areas where more training is needed
- To determine non-medical prescribers preferred methods of delivery for undertaking CPD
- To determine any barriers that non-medical prescribers face for completing CPD
- To compare and contrast the CPD needs of nurse and pharmacist prescribers.

METHOD

Ethics approval was granted from the Welsh School of Pharmacy Ethics Committee. Quantitative data was obtained using a piloted postal questionnaire, of mainly closed questions. These questions were produced following a literature review and by using the National Prescribing Centre (NPC) competency frameworks for pharmacist prescribers. The questionnaire was split into two sections. The first asked about their continuing CPD, for example how they have kept their knowledge and skills up to date, where they access information about CPD, how they prefer to complete their CPD, what areas they need training in, with the second section asking demographic data.

The piloted questionnaire, along with a covering letter and prepaid return envelope, was distributed to all non-medical prescribers in three local health boards and two large teaching hospitals in South-East Wales. After two weeks all non-responders were sent another questionnaire, and after a further 10 days the data was inputted and analysed in Statistical Package for Social Sciences (SPSS) version 16.0.1.

RESULTS

A response rate of 70% (n=89/127) was achieved, of which 64/90 nurses responded and 25/37 pharmacists. Six nurses (9%) and six pharmacists (24%) were not practising as non-medical prescribers.

The respondents indicated that they currently kept up to date for their clinical area by personal reading (90%), discussions with other non-medical prescribers (83%) and discussions with colleagues (74%). The main barrier to completing CPD was “A lack of time during working practice” (82%).

In relation to CPD for their clinical area, both nurses and pharmacists preferred to undertake CPD by attending study days (82%), followed by on-the-job training (78%) and through support of other colleagues (74%). However, for CPD related to prescribing practice more nurses than pharmacists wanted to attend study days (p=0.004) or lectures (p=0.001), while pharmacists preferred support from colleagues (42%) or internet-based learning (42%).

For 10 out of 21 NPC competencies assessed, there was a significant difference in the learning needs between nurses and pharmacists. Table 1 presents the five competencies where nurses deemed themselves as less competent than pharmacists and Table 2 where the pharmacists deemed themselves less competent than the nurses.

DISCUSSION

Although a quarter of nurses and pharmacists identified a number of common areas they require for CPD, it was interesting that both professions also have quite distinct needs. The nurses need more specific information related to medicine, whereas the pharmacists need more on patient assessment skills. These areas are similar to those which were identified when nurses and pharmacists completed a needs analysis at the start of the prescribing course. It is therefore important that a variety of courses are developed by CPD providers to accommodate the different professional needs.

The findings from this study have been used by the Cardiff University non-medical prescribing course, where for 2010–11 new patient assessment skills specifically for pharmacists have been introduced as have more intense therapeutic tutorials for nurses.

REFERENCES


Causes of prescribing errors on electronic discharge prescriptions

Lewis R†, Hodson KL‡
*Princess of Wales Hospital, Bridgend; †Cardiff University, Cardiff

Prescribing errors are common and known to cause adverse events, being particularly problematic when patients are transferred between care settings. Data has been collected on numbers and types of prescribing errors on electronic discharge prescriptions (eTOCs) in the study hospital. Pharmacists detected one error on 16% items checked (n=3491). The most common error types were omission and dosage instructions. Due
to the number of errors, it was decided to interview prescribers to find out why errors occurred with a view to suggest ways to reduce errors.

**OBJECTIVE**
To identify prescribers’ ideas or reasons to the causes of errors on eTOCs and to identify potential solutions.

**METHOD**
The NHS research ethics committee deemed the study service evaluation. Semi-structured interview was the chosen method; focus groups were not chosen because errors is a sensitive area. Permission was granted to adapt the interview schedule from previous research. Areas covered in the interview included the numbers and types of errors made, potential severity and possible causes. A purposive sample of the top three doctors of each grade when ranked by error rate and all four nurse-prescribers were invited for interview. An information sheet explaining reasons for interview was given to maximise response rate. Audiotaped interviews were conducted in a quiet room after obtaining written consent. Analysis started after each interview to build concepts and identify saturation. A coding framework was established and transcriptions were thematically analysed to determine reasons for errors.

**RESULTS**
Nineteen prescribers of varying grades and specialties were approached to participate, and 15 interviews were conducted, after which no new themes emerged. Table 1 presents themes identified from interviews.

**DISCUSSION**
Interviewing prescribers generated qualitative data on causes of prescribing errors which led to potential solutions. This was the research method of choice to gain detailed information and prescribers voiced their opinions without intimidation from peers. Study limitations may be prescribers not discussing all errors (eg, violations) and relying on prescribers’ accounts of events.

Reason’s model of accident causation has been used to categorise similar data, and therefore has been applied to this project to allow comparison. Error provoking conditions (EPCs) such as time pressure and workload were the most common causes of errors cited by prescribers. To reduce errors, prescribers identified they could ask for assistance from colleagues and reprioritise work giving more time for eTOCs. Poor documentation and legibility were identified as EPCs — a problem that has also been reported in the literature. These EPCs could be reduced by writing clearly and fully documenting decisions in notes and drug charts. Interviews revealed a few prescribers admitted to not reading all documentation blaming time pressure for this violation (active failure). This was particularly an issue when there was a greater length of patient stay, meaning more documentation and greater chance of medication changes. Prescribers have overall responsibility and acknowledged they should always fully check prescriptions (active failure).

Active failures (AFs) are worsened by EPCs. Distractions and interruptions resulted in skill-based slips and memory lapses, which are common. The prescribers would prefer somewhere quiet to prepare discharge prescriptions. Unfamiliarity with the medication or the patient are common knowledge-based mistakes. These may be reduced by making use of resources available (eg, BNF or ward pharmacist). An example of this relates to inhalers as junior doctors admitted they did not know about form or strength of different inhalers which resulted in many errors on eTOCs. Pharmacists now routinely endorse drug charts with this information to help prevent this occurring.

Latent conditions (LCs) lead to greater chance of errors occurring in the presence of EPCs/AFs. LCs from this study included prescribers being unaware of mistakes and it was evident from interviews the prescribers wanted feedback on mistakes to raise awareness and improve their prescribing. Organisational issues (eg, unfamiliarity with the patient) resulted from the prescriber being absent during the ward round, preparing a prescription for a different team and covering the nurse-led rehabilitation wards.

Empowering prescribers with facts on causes of errors gives them the greatest chance to prevent errors by themselves and their colleagues.

Following the study the data has been shared with prescribers and a multidisciplinary working group has been established to focus on reducing errors. Data will be re-collected to see if any reduction has occurred.

**REFERENCES**

**Severity of prescribing errors on paper and electronic discharge prescriptions**

**Lewis R**
Princess of Wales Hospital, Bridgend and Hodson, KH, Cardiff University, Cardiff

Documentation transferred between healthcare professionals when patients are discharged from hospital has led to medication incidents. Incidents have resulted from illegible or incomplete prescriptions, and a solution may be to reduce the risk of ambiguous communication. The information transferred to the GP must be complete and timely. In addition to the risks of incomplete information, errors in the transcription of medication at discharge may cause patient harm. As computerised prescriptions are thought to reduce this risk, the study hospitals implemented an electronic discharge prescription (eTOC) to improve communication to GPs. Data has been collected on the numbers and types of prescribing errors on discharge prescriptions in the study hospitals. An error was found on 44% of paper prescriptions (TTHs) and 60% of eTOCs (n=336 paper prescriptions, n=342 electronic prescriptions). The aim of this project was to evaluate the severity of the errors found using the recognised scale from Dean and Barber.

**OBJECTIVE**
To compare the severity of errors made on a sample of handwritten and electronic discharge prescriptions.
Adherence to bone protection treatments

Guy R†, Slane R*, Baqir W†
School of Pharmacy, Health and Wellbeing, University of Sunderland; †The Village Green Surgery

Osteoporosis is a systemic, skeletal disease characterised by low bone mass and micro-architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture. Recent guidelines from the National Institute for Health and Clinical Excellence (NICE) and the National Osteoporosis Guideline Group (NOGG) have advocated treatment with bone protection drugs for patients at risk of fracture. Adherence to bone protection therapy, particularly bisphosphonates, is generally poor, despite the availability of effective treatments.

METHOD

The study was undertaken at a North East general medical practice. All patients prescribed bone protection treatment between November 2009 and November 2010 were retrospectively identified from the medical practice’s clinical system. Patients on treatment for less than two months were excluded. The primary outcome for this study was mean possession ratio (MPR) — the number of days patients had requested their medication as a proportion of the number of days they should have received. MPR was used as a surrogate marker for patient adherence to bone protection medication. The study team set limits of 85 to 100% as normal adherence. The effect of age, sex and concomitant medications on MPR was statistically analysed (t-tests and ANOVA), using the Statistical Package for the Social Sciences (SPSS) software.

RESULTS

The study included 806 patients who were prescribed either statins, bisphosphonates or vitamin D. Of these, 471 were prescribed bisphosphonates. The mean MPR overall was 81.4%. This is significantly more than the recommended 75% (t-test, p < 0.05), demonstrating that adherence was generally poor. This study shows that patients prescribed bone protection medication have adequate adherence, despite the availability of effective treatments.
S34

Clinical Pharmacist  September 2011  Supplement 3

United Kingdom Clinical Pharmacy Association and Guild of Healthcare Pharmacists joint conference 2011

The study was approved by Sunderland University Ethics Committee.

RESULTS

The medical practice, at the time of this study, had 10,200 registered patients. Over the one-year period, 168 patients were identified as being prescribed bone protection therapy. Of these patients, 15 had been receiving treatment for less than two months and therefore were excluded from the study. Of the remaining 153 patients, the majority were taking alendronate 70mg weekly (n=100; 65.4%). The remaining patients were taking risedronate (n=34; 22.2%), strontium ranelate (n=11; 7.2%), ibandronic acid (n=3; 2%) and sodium clodronate (n=2; 1.3%). Three patients had ceased treatment but the drug remained on the clinical record; all three were on alendronate. From the 150 patients prescribed treatment, 67 (44.7%) had an MPR of less than 85% —ie, they were under-complying with treatment — while 64 patients (42.7%) had normal adherence (MPR 85 to 100%) and 19 patients (12.7%) had an MPR of greater than 100%. In the non-adherent cohort (MPR<85%), MPR ranged from 7.7% to 84.6% (average 61.7%; SD 23.2).

There were 123 women and 27 men in the population identified. There was no statistical difference between gender and MPR (p=0.933), with 44.4% of men (n=12) compared with 45.5% of women (n=55) having a MPR of less than 85%. Ten men (37%) and 54 women (43.9%) had a normal MPR and 1.9% (n=5) and 10.6% (n=13) of men and women, respectively, had a MPR above 100%. The youngest subject in the group was 21 years old, while the oldest was 95 years of age. Patients were categorised into four age groups (20–40 years; 41–60 years; 61–80 years and >80 years). The number of patients in each group was 3, 12, 76 and 58, respectively. There was no significant difference between age groups and MPR (p=0.549). The number of concomitant medicines taken by the 150 patients was 2.5%.

There were no significant differences when gender and age were compared statistically, suggesting that the problems with taking these treatments was specific to the medicines. It was not possible to test, statistically, the difference between agents due to low numbers in all groups other than the alendronate cohort. The majority of the patients in this population were taking over six medicines as well as bone protection treatments. There were concerns that polypharmacy may affect adherence. There were no differences in adherence rates when gender and age were compared statistically, suggesting that the problems with taking these treatments was specific to the medicines. It was not possible to test, statistically, the difference between agents due to low numbers in all groups other than the alendronate cohort. The majority of the patients in this population were taking over six medicines as well as bone protection treatments. There were concerns that polypharmacy may affect adherence. However, this was not shown to be the case in this study.

In conclusion, this study at a large general practice has demonstrated that patient adherence to bone protection treatments remains poor. Further work is being planned in an attempt to understand the complex issues concerning low compliance with these medicines.

REFERENCES


Insights into medicines use reviews and patient experiences of the service

Latif A*, Boardman H*, Pollock K*†

*Division of Social Research in Medicines and Health, School of Pharmacy, University of Nottingham; †School of Nursing, Midwifery, and Physiotherapy, University of Nottingham

Medicines Use Reviews (MURs) are a UK community pharmacy service that was commissioned in 2005 and aims to improve "patient's knowledge, concordance and use of medicines".1 MURs aim to address medicine wastage from unused medicines, estimated to cost over £100m annually.2 Pharmacies are remunerated £28 per MUR up to an annual limit of 400. In England, 1.7 million MURs were conducted in 2009–10. A national evaluation of MUR activity reported barriers such as increased pressure on the pharmacists’ time and a perceived lack of support from general practitioners (GPs).3 However, to our knowledge there have been no studies that have observed MUR consultations as they occur in a real world setting and explored patient experience of them.

OBJECTIVES

This paper reports findings from a wider observational study of patient and professional perceptions of MURs and will present insights into the dynamics of the MUR consultation and subsequent patient experiences of the service.

METHOD

Following approval from a local NHS research ethics committee, an independent and a multiple pharmacy were recruited. Consent was obtained from pharmacy staff for five weeks of observations in each pharmacy during November 2008 to October 2009. Observation notes were obtained from pharmacy staff for five weeks of observations in each pharmacy during November 2008 to October 2009. Observation notes were taken of MUR consultations as they occurred in a real world setting and explored patient experience of them.

RESULTS

Observations of MURs: Most patients were invited for an MUR by the pharmacist in an ad hoc way. Of 54 patients asked, all gave consent for AL to observe their MUR consultation. Observations of MUR consultations found they were dominated by closed questions that forestalled wider patient and professional perceptions of MURs and will present insights into the dynamics of the MUR consultation and subsequent patient experiences of the service.

OBJECTIVES

This paper reports findings from a wider observational study of patient and professional perceptions of MURs and will present insights into the dynamics of the MUR consultation and subsequent patient experiences of the service.

METHOD

Following approval from a local NHS research ethics committee, an independent and a multiple pharmacy were recruited. Consent was obtained from pharmacy staff for five weeks of observations in each pharmacy during November 2008 to October 2009. Observation notes were made by AL of all pharmacy activities, staff-patient conversations and all activities relating to MURs. Patients were afterwards invited to take part in an interview about their MUR. Most patient interviews occurred at the pharmacy (two at a university), lasted around 45 minutes and all were audio-recorded. After the pharmacy observations, five pharmacists and 12 support staff agreed to be interviewed to discuss their perceptions of MURs. All observation notes were typed up and the interviews transcribed verbatim. The data were imported into N-Vivo8 and iteratively coded based on categories and concepts of the research participants. Analysis used the principles of constant comparison for anticipated and identified themes.

RESULTS

Observations of MURs: Most patients were invited for an MUR by the pharmacist in an ad hoc way. Of 54 patients asked, all gave consent for AL to observe their MUR consultation. Observations of MUR consultations found they were dominated by closed questions that forestalled wider discussions of the patients’ health and medicines. This enabled the quick completion of the MUR form. Most patient-pharmacist communication followed a unilateral approach to patient counselling.4 Patients rarely asked questions and indeterminate issues were often circumvented by the pharmacist when they did.

Patient interviews: Thirty-four patients (63%) subsequently agreed to an interview. Patient interviews revealed that awareness of MURs was poor.
Patients reported some unresolved concerns about their medicines and perceived that the process merely involved “checking” medication. Most patients framed the MUR in positive terms. However, patients reported that MURs did little to increase their knowledge. They felt adequately informed about their medicines, most of which had been prescribed long term. MUR rarely affected medicine use as patients felt there was no need to change their medicine taking habits. Several patients recognised that MURs may be more useful for others such as older patients who might be confused with their medicines:

Researcher: “…how much more knowledgeable were you about your medicines?”

Jill: “[Sigh] Well I don’t think I’ve got no more knowledge, I think it’s just that I’ve been on these for so long, and once you’ve been on them for so long the doctor does make sure that you’re alright with them.” (76 yr. F. Multiple)

Eve: “The only thing I was more knowledgeable about was when she told me it was all right to take them like that [to take tablets together]…it put my mind at rest…” (75yr F Independent)

Some patients reported that the MUR had been an opportunity to discuss minor issues, such as which medicines could be co-administered. These issues were not perceived important enough to discuss with their GP. In this way, MURs helped reassure patients about their medicines and that they were “doing the right thing”. Likewise, most patients perceived their GP as the main authority over their medicines and considered that more significant problems would best be resolved by talking to them. Some patients reported there was potential for the MUR to cause tension between the GP and pharmacist indicating an awareness of the impact that MURs could exert over professional boundaries and responsibilities:

Ashley: “I don’t think they [GPs] like it, outside interference. Is that the word…they just don’t like outside interference, being from a novice, a pharmacist or anybody else, is what I think with my quack…” (67yr M. Multiple)

Despite this, patients welcomed the attention given in the MURs and felt comfortable speaking with the pharmacist who was seen as an approachable and knowledgeable professional. Pharmacists reported that MURs were constrained by the pharmacist’s pressure of work, the need to return to dispensing duties and particularly in the multiple, were influenced by the need to achieve targets.

**DISCUSSION**

MURs offer the opportunity for pharmacists to privately discuss medicine usage with patients and extend their professional role. Most patients valued the time the pharmacist spent with them and welcomed the opportunity to discuss their medicines in private. Nevertheless, the lack of perceived authority the pharmacist had over patients’ prescribed medicines, the disconnectedness of MURs from other services and professional contacts raised concerns among some over boundary encroachment. Patients’ lack of awareness of what the MUR could offer, the structured format of the MUR and the pharmacists’ unilateral approach to patient counselling meant that professional rather than lay objectives were followed. Most patients reported their MUR had little impact on their knowledge or use of their medicines.

MURs had been implemented without due consideration of the pharmacists’ heavy commitment to the dispensing process which meant there was poor integration of the MUR service into their routine workload. Changes to policy need to be considered particularly the way organisations implement and incentivise pharmacists to perform MURs. Only two pharmacies were investigated and further research is clearly needed in a wider and more diverse range of community pharmacy settings. Further research should investigate whether better targeting of MURs improves their outcome or whether this depends upon widening their scope and improving the consultation skills of pharmacists.

**What should clinical pharmacists do?**

Acomb C, Lowey A Leeds Teaching Hospitals NHS Trust

With pressures on budgets and resources, it is important to make the best use of our pharmacist resource. We decided to investigate which direct patient care activities had the biggest impact on patient care.

**OBJECTIVES**

- To review the range of direct patient care activities undertaken by pharmacists
- To review the significant interventions made by pharmacists undertaking direct patient care activities

**METHOD**

In collaboration with a number of our advanced clinical pharmacists, we established definitions for all the direct patient care activities undertaken by our pharmacists. We identified 13 different activities (examples include: medication history, prescription review, medicines review). Some of these definitions build on previous papers. A data collection tool was developed that collected the number of patients related to each activity. The tool also included a section for significant interventions or contributions to patient care; making it possible to link each intervention or contribution with the activity that the pharmacist was undertaking at the time. The outcomes of the interventions or contributions were categorised by the pharmacist into: changes to the prescription; changes to the monitoring of treatment; or a new referral made to another clinical team. The pharmacist also ranked the contribution to patient care in relation to the risk to the patient and the likelihood of that risk occurring if the pharmacist had not intervened. During one week (five weekdays) in December 2010 all pharmacists were asked to collect data whiles undertaking “clinical work” on wards or in clinics (not dispensaries). These data were analysed using Microsoft Excel.

**RESULTS**

We collected data from 79 pharmacists who between them undertook 951 hours of direct patient care activities on wards and in clinics. The 79 pharmacists included part-time staff, those whose main job was something else than medicines.

**Table 1: Activity that led to contributions that were likely or very likely to have prevented harm**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Major morbidity</th>
<th>Life threatening</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine review</td>
<td>118</td>
<td>1</td>
<td>119 (34%)</td>
</tr>
<tr>
<td>Medicines reconciliation</td>
<td>66</td>
<td>4</td>
<td>70 (20%)</td>
</tr>
<tr>
<td>Request for advice from medical staff</td>
<td>36</td>
<td>3</td>
<td>39 (11%)</td>
</tr>
<tr>
<td>Prescription review of discharge Rx</td>
<td>19</td>
<td>2</td>
<td>21 (6%)</td>
</tr>
<tr>
<td>Prescription review of inpatient chart</td>
<td>16</td>
<td>0</td>
<td>16 (5%)</td>
</tr>
<tr>
<td>Ward round / multidisciplinary meeting</td>
<td>14</td>
<td>1</td>
<td>15 (4%)</td>
</tr>
<tr>
<td>Concordance consultation with patient</td>
<td>12</td>
<td>2</td>
<td>14 (4%)</td>
</tr>
<tr>
<td>Pharmacist prescribing</td>
<td>13</td>
<td>0</td>
<td>13 (4%)</td>
</tr>
<tr>
<td>All other activities</td>
<td>42</td>
<td>4</td>
<td>46 (13%)</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>336</strong></td>
<td><strong>17</strong></td>
<td><strong>353</strong></td>
</tr>
</tbody>
</table>

**Table 2: Breakdown of specialities where pharmacists made significant contributions**

<table>
<thead>
<tr>
<th>Speciality</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine (acute medicine, cardiology, gastroenterology, endocrine etc)</td>
<td>453 (24%)</td>
</tr>
<tr>
<td>Care of the elderly</td>
<td>242 (13%)</td>
</tr>
<tr>
<td>Surgery</td>
<td>326 (17%)</td>
</tr>
<tr>
<td>ICU and HDU</td>
<td>115 (6%)</td>
</tr>
<tr>
<td>Paediatrics and neonates</td>
<td>137 (7%)</td>
</tr>
<tr>
<td>Specialist medicine (renal, liver, Infectious diseases)</td>
<td>151 (8%)</td>
</tr>
<tr>
<td>Haematology and oncology</td>
<td>306 (16%)</td>
</tr>
<tr>
<td>All other</td>
<td>136 (7%)</td>
</tr>
</tbody>
</table>

References

other than clinical pharmacy, as well as those whose principal function was clinical work. They made 331 visits to wards and clinics and recorded activity for 11,705 patients. The pharmacists recorded 1,873 significant contributions to patient care. This equates to a pharmacist making a significant contribution to patient care for every 30 minutes of clinical activity.

Of the 1,873 contributions 590 (32%) were the result of undertaking a medicines review and 318 (17%) were the result of undertaking medicines reconciliation. Only 112 (5%) of all significant contributions were the result of routine prescription review of the inpatient drug chart. Our prescribing pharmacists wrote prescriptions for 64 patients which accounted for 3% of all contributions.

Three hundred and fifty-three (19%) contributions were classified as highly significant (patient likely, or very likely, to have either major morbidity or a life threatening event, if the contribution had not been made). Of these 353 contributions, 119 (34%) were the result of a pharmacist undertaking medicine review (that involves the pharmacist having to access the patient’s medical record). See Table 1.

Pharmacists had to review the inpatient prescription charts of 170 patients to make one highly significant contribution, whereas they only had to undertake 27 medicines reviews to make one highly significant contribution. In terms of absolute numbers most interventions / contributions were made in general medicine (see Table 2).

DISCUSSION

Our pharmacists make significant contributions to patient treatment with 17 potentially life threatening events prevented every five working days. In this paper we have separated out prescription review (looking at a drug chart without access to other information) from medicines review (with access to pathology results and the medical record). Medicine review leads to more highly significant contributions than a pharmacist looking at an inpatient drug chart in isolation. This study has provided a wealth of data for analysis and provides answers to a series of questions being asked by managers. This review only looked at weekday activity. It is likely that patients admitted at weekends and evenings will also benefit from pharmacists’ skills. We are currently reviewing our clinical pharmacy service outside our standard working hours and will use similar methodology to evaluate its impact. Significant contributions were made by our pharmacists in all specialities. It appears that wherever we send a pharmacist they make significant contributions to patient care. Further analysis is required to relate time spent on an activity within individual specialities with number of significant contributions. These data are being shared with hospital managers and clinical directors to support discussions about pharmacy services in times of budget cuts.

REFERENCES

1 Acomb C. Prescription validation and medication review. Poster presented at UKCPA November 2008

The role of the non-medical prescribing lead

Courtenay M*, Lim R*, Stenner K*, Carey N*, Fleming G†
*University of Surrey, Guildford; †Kent Surrey Sussex Postgraduate Deanery, Horley

The development of non-medical prescribing (NMP) in the UK has been significant over the past 20 years. It started with the introduction of prescribing rights for nurses from a limited formulary and has gradually extended to independent prescribing for pharmacists and nurses with a recommendation that this be extended to physiotherapists and podiatrists. Successive legislative changes have afforded new opportunities for NMPs to improve the quality of services and productivity. However, it has been challenging to ensure that these opportunities are reflected in workforce strategies as well as ensuring that staff are well supported to undertake their role safely. The role of the NMP lead has evolved in different ways as NMP has developed, which raises questions about what NMP leads do and how the role can be developed and supported in the future. The aim of this study was to explore and characterise the role of the NMP lead across NHS South East Coast to inform future planning to ensure its success.

OBJECTIVES

1 To examine the selection process for NMP leads
2 To identify how much time is devoted to the role of NMP lead and the activities within it
3 To explore the role of the NMP lead in safety and clinical governance systems for NMP
4 To identify internal and external facilitators and barriers to conducting the NMP lead role effectively

METHOD

The project received a favourable feedback from the ethics committee of the University of Surrey. A steering group was established to advise on the design and implementation of the project representing acute trusts, primary care trusts, mental health trusts, strategic health authority and academia. Semi-structured telephone interviews were used. The interview schedule was developed from the interim findings of research in progress and minor modifications were made by the steering group. Participants were issued with a study information leaflet and signed a consent form. Quantitative data was analysed using SPSS V17 and qualitative data was analysed using thematic analysis. A coding framework was developed based on emerging themes and initial research questions. Forty per cent of interviews were independently coded with 93% agreement.

RESULTS

Twenty-seven (69%) of the 39 NMP leads across the region took part in the study. These were predominantly from acute and mental health trusts (94% return compared with 43% for the commissioning arm of PCTs). There was no structured process to determine who should be NMP lead within organisations. Reasons for adopting the role included previous experience as a lead, holding a senior role within an organisation, and recently qualifying as a prescriber. Less frequently the role was linked to a specific position within the organisation. The amount of time dedicated to the NMP lead role varied with the majority (46%) spending less than three hours per week on average in the role. It was highlighted that the time required for the role can vary throughout the year. Fourteen (52%) said a lack of time to fulfil the role was an issue.

The most frequently cited activities within the NMP lead role are shown in Table 1.

The role of the NMP lead in assuring good governance and safety systems was highlighted. Twenty-four organizations (89%) had an up-to-date NMP policy in place. Sixteen (59%) participants reported it was their responsibility to write and update this policy. Other leads shared this responsibility with pharmacy, other leads and stakeholders.

NMP leads had a role in supporting NMPs to keep up to date —this included monitoring legislation relating to NMP (89%) and co-ordinating networks (32%). All organisations maintained a database of NMPs but the content of this was highly variable. Twenty-three NMP leads (85%) held responsibility for undertaking this role.

<table>
<thead>
<tr>
<th>Table 1: Activities undertaken within the NMP lead role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role</td>
</tr>
<tr>
<td>Strategic influence</td>
</tr>
<tr>
<td>Selection and screening of potential students</td>
</tr>
<tr>
<td>NMP policy production and review</td>
</tr>
<tr>
<td>Acting as an information resource about NMP to others</td>
</tr>
<tr>
<td>Maintaining a database of NMPs</td>
</tr>
<tr>
<td>Ordering and distributing the BNF</td>
</tr>
</tbody>
</table>

OBJECTIVES

1 To examine the selection process for NMP leads
2 To identify how much time is devoted to the role of NMP lead and the activities within it
3 To explore the role of the NMP lead in safety and clinical governance systems for NMP
4 To identify internal and external facilitators and barriers to conducting the NMP lead role effectively

METHOD

The project received a favourable feedback from the ethics committee of the University of Surrey. A steering group was established to advise on the design and implementation of the project representing acute trusts, primary care trusts, mental health trusts, strategic health authority and academia. Semi-structured telephone interviews were used. The interview schedule was developed from the interim findings of research in progress and minor modifications were made by the steering group. Participants were issued with a study information leaflet and signed a consent form. Quantitative data was analysed using SPSS V17 and qualitative data was analysed using thematic analysis. A coding framework was developed based on emerging themes and initial research questions. Forty per cent of interviews were independently coded with 93% agreement.

RESULTS

Twenty-seven (69%) of the 39 NMP leads across the region took part in the study. These were predominantly from acute and mental health trusts (94% return compared with 43% for the commissioning arm of PCTs). There was no structured process to determine who should be NMP lead within organisations. Reasons for adopting the role included previous experience as a lead, holding a senior role within an organisation, and recently qualifying as a prescriber. Less frequently the role was linked to a specific position within the organisation. The amount of time dedicated to the NMP lead role varied with the majority (46%) spending less than three hours per week on average in the role. It was highlighted that the time required for the role can vary throughout the year. Fourteen (52%) said a lack of time to fulfil the role was an issue.

The most frequently cited activities within the NMP lead role are shown in Table 1.

The role of the NMP lead in assuring good governance and safety systems was highlighted. Twenty-four organizations (89%) had an up-to-date NMP policy in place. Sixteen (59%) participants reported it was their responsibility to write and update this policy. Other leads shared this responsibility with pharmacy, other leads and stakeholders.

NMP leads had a role in supporting NMPs to keep up to date —this included monitoring legislation relating to NMP (89%) and co-ordinating networks (32%). All organisations maintained a database of NMPs but the content of this was highly variable. Twenty-three NMP leads (85%) held responsibility for undertaking this role.

<table>
<thead>
<tr>
<th>Table 1: Activities undertaken within the NMP lead role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role</td>
</tr>
<tr>
<td>Strategic influence</td>
</tr>
<tr>
<td>Selection and screening of potential students</td>
</tr>
<tr>
<td>NMP policy production and review</td>
</tr>
<tr>
<td>Acting as an information resource about NMP to others</td>
</tr>
<tr>
<td>Maintaining a database of NMPs</td>
</tr>
<tr>
<td>Ordering and distributing the BNF</td>
</tr>
</tbody>
</table>

REFERENCES

1 Acomb C. Prescription validation and medication review. Poster presented at UKCPA November 2008
support was valued particularly regionally NMP leads network and informal networking with similar trusts. The main barriers to the NMP lead role were a lack of time, having an operational rather than strategic NMP lead role; lack of authority to escalate issues, a poor organisational attitude to NMP, lack of knowledge about what the role entails, poor communication with universities and pharmacy departments and organisational change.

DISCUSSION
Limitations of the study are that responses may be skewed as there was not a 100% return. Also the findings might not be extrapolate to a wider geography —although previous unpublished research from another geographical region revealed similar issues and challenges in the NMP lead role We conclude that the NMP lead plays a significant role in embedding NMP within organisations. However, a shift in organisational ethos and attitudes towards better understanding of NMP is required in order to embed the role and its functions. Leads need clearly defined roles and access to formal internal and external support structures. A lack of support, resources and authority can prevent leads from intervening to address some of the barriers facing NMPs, to resolve NMP issues and to develop NMP. Time was cited as a major barrier to acting effectively as an NMP lead —as a result, the regional network is embarking on a programme of work to avoid duplication through the creation of a shared database and production of a common NMP policy template. Organisations can also do more to optimise skill mix within the NMP lead role, ie, a division of strategic and operational roles with adequate administrative support. Guidance for local organisations on the key functions of the role and essential internal and external support has been produced.

REFERENCES

The NHS Pharmacy Staffing Establishment and Vacancy Survey 2010: What does it tell us about our NHS pharmacy staffing issues?

Sanders S, Bollington L, Sharott P
On behalf of the NHS Pharmacy Education & Development Committee

The NHS Pharmacy Education & Development Committee has undertaken a survey of NHS pharmacy staff for several years. A 100% response rate was achieved in 2009 and 2010, from all NHS trusts, primary care trusts (PCTs) and local health boards (LHBs) across the UK.

OBJECTIVES
● To collect and collate complete and accurate data on pharmacy staffing establishments, head count and vacancy rates for all NHS trusts across the UK on 31 May 2010.
● To compare these data with those collected in the two previous years.
● To consider trends and vacancy rates to consider recruitment & retention issues.
● To utilise the data locally for workforce planning purposes, including consideration of the numbers of trainees required.

METHOD
The National NHS Hospital Pharmacy Staffing Establishment and Vacancy Survey 2010 included all NHS acute and mental health trusts and PCTs/LHBs in England, Wales, Scotland and Northern Ireland.

The methodology was similar to previous surveys. A spreadsheet template, covering all pharmacy staff, was sent to the chief pharmacist in each NHS organisation. Non-responders were followed-up repeatedly. Ethics committee approval was not obtained.

DISCUSSION
There has been a decrease in Band 6 pharmacist posts, and an increase in both Band 7 and Band 8a pharmacist posts (Table 1). A similar pattern emerged for pharmacy technicians.

● The decrease in Band 6 pharmacist posts, and increase in Bands 7 and 8a posts, result in concerns about the loss of “training grade” posts at Band...
The effect of clinical decision support on drug dosage adjustment in Inpatients with impaired kidney function

Hardy I1, Sheridan R†, Marvin V2, Levy J11, Ashoe D‡

1 Lead Pharmacist, 2Clinical Pharmacist, 3Deputy Chief Pharmacist, 11Consultant Nephrologist, 1HIV/GUM Consultant, Chelsea and Westminster Hospital, NHS Foundation Trust

Acute kidney injury (AKI) is a serious and not uncommon sequel to hospital admission irrespective of the presenting diagnosis. It occurs in 4.9% of hospitalised patients and dosages in 20–46% of prescriptions require adjustment based on kidney function.1 Adjustments of prescriptions for patient with kidney injury are often omitted because information on kidney function is not readily available at the point of care.2 Adverse drug reactions are often associated with errors including failure to adjust doses appropriately.3

Our hospital has undertaken a two-and-a-half-year project to implement electronic prescribing in the inpatient setting. During the preparation for the roll-out to the HIV directorate, the National Confidential Enquiry Into Patient Outcome and Death (NCEPOD) report, reviewing the care of patients who died in hospital with a primary diagnosis of AKI, was published. This report identified the need for strategies to improve outcomes for these patients.1

As part of the strategy for change within our hospital, we designed, built and implemented an electronic creatinine clearance (CrCl) calculator within the electronic prescribing system, using the Cockcroft-Gault equation, to classify the degree of renal insufficiency. This calculator is accessed through the single click of a button that is present on all point of prescribing screens.

OBJECTIVE

To understand the impact of clinical decision support integrated within electronic prescribing on accuracy of prescribing of patients with kidney injury.

METHOD

1 A data collection tool was designed and approved by a team of HIV doctors and pharmacists and ethics approval sought.
2 First the data collection tool was piloted and then collection carried out by the ward pharmacist on an HIV inpatient ward
3 To quantify the problem, a pre-intervention data collection was undertaken for baseline prescribing on paper drug charts of 53 patients

4 Following the first three months of implementation of electronic prescribing with clinical decision support, collection with the same data tool on the same ward was repeated on electronic drug charts of 66 patients

5 All results were compared using the unpaired student t-test and the level of significance was assessed.

RESULTS

The results are set out in Table 1.

DISCUSSION

Through the use of a clinical decision support tool integrated within electronic prescribing a patient’s kidney function is now easily accessible at the point of prescribing. This clinical decision support tool has improved the accuracy of prescribing for nephrotoxic medicines by using a series of four alerts.

We have demonstrated an improvement in dosage accuracy of prescriptions requiring adjustment based on kidney function and have learned that clinical decision support renal function calculators are powerful tools to support prescribers in safe and accurate dosing of medicines. Most notably, when using electronic prescribing with integrated clinical decision support, we observed a 51% decrease in the number of prescriptions that require adjustment that are not correctly prescribed.

This improvement work was undertaken through collaboration with doctors, pharmacists, nurses and the IT department with the backing and support of the hospital executive.

Despite the fact that some limitations were able to be overcome, such as:

- Automatic adjustment of weight used in the calculation to be Ideal Body Weight (IBW) for obese patients
- Age validity for patients 20 to 100 years
- Serum creatinine level validity for inpatients (result within four days) and non-inpatients (result within 90 days)

there are still a number of limitations that exist that have not yet been overcome:

- Automatic race adjustment for Afro-Caribbean patients
- Receiving renal replacement therapies has not been incorporated

Additionally we have identified that isolated values to quantify kidney function are not as valuable as relative or absolute changes when identifying deterioration. With the change of British National Formulary4 prescribing advice from Cockcroft-Gault to the Modification of Diet in Renal Disease (MDRD) estimate of glomerular filtration rate (eGFR), the CrCl calculator will need to be updated.5

During this development cycle we also hope to build delta checking into our calculator and alerts to identify a:

- fall in eGFR > 20%
- fall in eGFR by > 10ml/minute
- fall in eGFR to < 30 ml/minute.

It is through these ongoing developments that we hope to further improve the accuracy and safety of prescribing for patients with impaired kidney function.
A collaborative service evaluation to investigate whether the clinical impact of pharmacy-led medicines reconciliation (MR) varies according to care area

Dods L J
Medicines Use and Safety Division, East and South East England Specialist Pharmacy Services

Delivering the NICE/NPSA safety solution 001 to all adult inpatients remains a significant challenge. To support efforts to improve the quality and productivity of NHS services, a collaborative service evaluation was designed to provide managers with data to help target delivery of limited pharmacy-led MR services to patients who would benefit the most.

OBJECTIVES
- To quantify omitted drugs and wrong doses per MR for different care area
- To assign BNF chapter category and a severity rating to identified errors
- To look for factors that may be linked with admission prescribing errors

METHOD
A data collection form and instruction sheet were prepared and piloted. It was verified that research and ethics approval were not required and data were collected during September 2010. The care area and time taken were recorded for each MR. For each omitted drug and wrong dose error identified, the following were recorded: BNF category, total number of admission drugs, planned or unplanned admission; availability of patient own drugs (PODs). Data collectors were asked to assign a severity grade to all omitted drug and wrong dose errors identified using a grading scale adapted from the National Reporting and Learning System (NRLS). The actual drug name was recorded for each error classed as Level 3 (moderate: could have resulted in moderate increase in treatment with significant but non permanent harm) or Level 4 (severe/major: could have resulted in permanent harm). The data for each care area were collated and reviewed by the nominated coordinator in each organisation and submitted to the Medicines Use and Safety Division of East & South East England Specialist Pharmacy Services where they were aggregated into an Excel spreadsheet under 10 defined care areas and analysed.

RESULTS
Thirty-one acute trusts participated (eight from East of England; 11 from London; 4 from South Central; eight from South East Coast). 3091 MRs were reviewed across 10 care areas (number of MRs reviewed in brackets): admissions (1,062); general medicine (435); cardiac (302); respiratory (96); specialist medicine and endocrine (53); general surgery (292); specialist surgery (360); orthopaedics (179); care of the elderly (149); other (167). 4,041 omitted drugs and wrong doses were identified, which represented an average of 1.3 omitted drugs and wrong doses per MR (range across nominated care areas: 0.58–1.7 per MR). Of the 4,041 errors identified 80.1% were associated with unplanned admissions; 76.4% were associated with patients on five or more admission drugs; and 41.7% of errors were for patients who had PODs.

Table 1 records the omitted drugs and wrong dose errors classed as Level 3 or 4 across the care areas by BNF category. Level 3 & 4 errors comprised 1622 (40%) of overall reported errors (range 31–52% across the care areas). 162 errors overall (0.05/MR) were associated with the following high risk drugs: warfarin (15); antiepileptics (43); steroids and immunosuppressants (22); antiparkinson agents (26); methotrexate (12); insulin (24).

DISCUSSION
Table 1 demonstrates that 79% of errors classed as Level 3 or 4 related to cardiovascular, CNS, respiratory and endocrine drugs, all of which could be crucial to the management of co-existing long term conditions. The frequency and types of error were similar to the data presented in the review underpinning the safety solution2 and the EQUIP study3 and clearly demonstrate that pharmacy-led MR contributes significantly to overall patient safety outside research settings. In this and an earlier audit4 the numbers of omitted drugs and wrong doses per MR were similar across all the care areas reviewed indicating that care area alone cannot guide prioritisation when there is limited resource to deliver a pharmacy-led MR service; however, this work has indicated that errors are likely to be associated with unplanned admissions and patients taking multiple therapies. Over 40% of errors were associated with patients who had brought in their own drugs. This raises a number of interesting questions about the use of PODs during the admission process. Improved uptake of PODs plus training on how to use PODs optimally during clerking may offer another option to improve medicines reconciliation when pharmacy staff are unable to offer a service.

REFERENCES

Table 1: BNF categories for omitted drug and wrong dose errors by care area

<table>
<thead>
<tr>
<th>Care area</th>
<th>Level 3/4</th>
<th>Omitted dose</th>
<th>Wrong dose 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admissions</td>
<td>619</td>
<td>511</td>
<td>108</td>
<td>20</td>
<td>250</td>
<td>49</td>
<td>117</td>
<td>12</td>
<td>93</td>
<td>4</td>
<td>7</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>General medicine</td>
<td>170</td>
<td>135</td>
<td>35</td>
<td>15</td>
<td>51</td>
<td>29</td>
<td>77</td>
<td>5</td>
<td>25</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Cardiology</td>
<td>112</td>
<td>96</td>
<td>26</td>
<td>76</td>
<td>57</td>
<td>7</td>
<td>13</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>C of E (inc stroke)</td>
<td>165</td>
<td>131</td>
<td>34</td>
<td>7</td>
<td>2</td>
<td>26</td>
<td>2</td>
<td>23</td>
<td>1</td>
<td>9</td>
<td>0</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>42</td>
<td>36</td>
<td>6</td>
<td>1</td>
<td>20</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Specialist medical</td>
<td>53</td>
<td>48</td>
<td>6</td>
<td>3</td>
<td>21</td>
<td>6</td>
<td>13</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>General surgery</td>
<td>191</td>
<td>169</td>
<td>22</td>
<td>13</td>
<td>72</td>
<td>14</td>
<td>41</td>
<td>3</td>
<td>19</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>T&amp;D</td>
<td>131</td>
<td>114</td>
<td>17</td>
<td>7</td>
<td>46</td>
<td>10</td>
<td>24</td>
<td>2</td>
<td>21</td>
<td>1</td>
<td>0</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Specialist surgery</td>
<td>139</td>
<td>106</td>
<td>33</td>
<td>12</td>
<td>37</td>
<td>14</td>
<td>17</td>
<td>5</td>
<td>23</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>TOTALS</td>
<td>1622</td>
<td>1355</td>
<td>287</td>
<td>82</td>
<td>636</td>
<td>145</td>
<td>281</td>
<td>32</td>
<td>276</td>
<td>16</td>
<td>23</td>
<td>71</td>
<td>31</td>
</tr>
<tr>
<td>% errors by BNF</td>
<td>100</td>
<td>5</td>
<td>39</td>
<td>9</td>
<td>17</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
Antibiotic intravenous to oral switch guidelines: Barriers to adherence and solutions to poor adherence

Warburton J*, Hodson K†, Gibbs K*†
*University Hospitals Bristol NHS Foundation Trust; †Department of Pharmacy, Cardiff University

The timely switch of intravenous to oral antibiotics has been shown to reduce hospital stay with no ill effects. Other supposed benefits of switching to oral antibiotics include lower incidence of healthcare associated infections, reduced medication costs and a reduction in nursing time required to complete a medicine round. Many NHS trusts have employed the use of intravenous to oral switch guidelines to promote good practice recommendations as identified by the Department of Health.

Adherence to the local guideline has been repeatedly poor (around 45%) despite the application of multiple audit cycles suggesting that the important barriers to adherence have not yet been identified.

OBJECTIVE
This study was undertaken to identify barriers to following the intravenous to oral switch guideline and explore possible solutions as perceived by those healthcare professionals involved.

METHOD
A Delphi study was employed to identify themes and to generate consensus on the most important barriers and corresponding solutions as perceived by an expert panel. Ethical approval was deemed unnecessary by the research and ethics committee who classified the work as service development. The panel of 29 consisted of doctors, nurses and pharmacists from across the trust who were in contact with patients on intravenous antibiotics on a daily basis. The Delphi study consisted of three rounds, the first of which invited qualitative responses on barriers and solutions. The qualitative data was thematically analysed and formulated into Delphi statements which were then presented to the expert panel in rounds 2 and 3 to seek the perceived importance of the statements on a five-point ordinal scale from irrelevant to very important. Participants were invited to change their opinion between rounds based on the outcome of the previous round and commentary by other panel members. Correspondence was by electronic mail and each round had a two-week deadline for reply. The group position was illustrated to other panel members. Correspondence was by electronic mail and each round had a two-week deadline for reply. The group position was illustrated to other panel members.

RESULTS
Of 29 panel members 13 (45%) completed all three rounds. Of these respondents there were no nurses remaining following round 3. Thirty-five Delphi statements were formulated following round 1: 18 barriers and 17 solutions. There were no requests for clarification or alteration of any of the statements. Table 1 presents an overview of the statements where consensus was achieved. The lack of participation by nurses should be investigated further as it could be attributed to doubt surrounding their role in the switch. Nurses however are well placed to prompt the review of intravenous antibiotics due to their involvement in administration and patient care. Pharmacists, despite being considered not confident enough to encourage intravenous to oral switch (B13), are integral in daily chart review and even imposing restrictions on the supply of intravenous antibiotics.

Table 1: Statements where consensus was achieved (IQR 0 or 1)

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Irrelevant</th>
<th>Unimportant</th>
<th>Unsure</th>
<th>Important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers</td>
<td>14 (78%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>4 (23%)</td>
<td>9 (64%)</td>
<td>1 (7%)</td>
</tr>
<tr>
<td>Solutions</td>
<td>14 (82%)</td>
<td>0 (0%)</td>
<td>1 (7%)</td>
<td>2 (14%)</td>
<td>10 (71%)</td>
<td>1 (7%)</td>
</tr>
</tbody>
</table>

REFERENCES

DISCUSSION
This Delphi study was successful in identifying barriers to guideline adherence and potential solutions as well as the perceived importance of each. Those barriers and solutions considered important or very important will be essential in considering future review of the intravenous to oral switch guideline and providing education for those healthcare professionals involved. Barriers including lack of awareness or inability to access the guidelines may be straightforward to rectify however limited weekend review and omission of antibiotic reviews from daily ward rounds requires a change in practice. There is still a deep-seated concern that oral antibiotics will never treat the infection effectively despite the evidence in the literature. The solutions that were proposed to poor guideline adherence included provision of case study based education sessions, ensuring that oral switch options are included by microbiology where possible with recommendations based on sensitivities and setting out minimum monitoring requirements for patients on intravenous antibiotics to inform the switch process. It was also proposed that a switch plan should be documented in the medical notes if an intravenous antibiotic review falls on a weekend. This array of solutions shows the need for a multidisciplinary approach to improving guideline adherence.

The lack of participation by nurses should be investigated further as it could be attributed to doubt surrounding their role in the switch. Nurses however are well placed to prompt the review of intravenous antibiotics due to their involvement in administration and patient care. Pharmacists, despite being considered not confident enough to encourage intravenous to oral switch (B13), are integral in daily chart review and even imposing restrictions on the supply of intravenous antibiotics.

Investigating the opinions and perceptions of nurses and other healthcare professionals on the red tabard system

Taylor AL, Orton J, Nickless G
Pharmacy Department, Wirral University Teaching Hospital NHS Foundation Trust

Disruptions to nursing staff during drug administration rounds are common — a study performed by Cardiff and Vale NHS Trust determined that nurses can be interrupted up to 17 times per drug round, and a recent study in London found that for 49 drug administration sessions observed, nurses were interrupted during 40 (82%) with an average of 1.5 disturbances per session. A recent observational study found that each interruption is associated with a 12.1% increase in

---

**Table 1: Statements where consensus was achieved (IQR 0 or 1)**

- **Category**: Barriers and Solutions
- **Total**: Total number of participants
- **Irrelevant**: Participants who rated it as irrelevant
- **Unimportant**: Participants who rated it as unimportant
- **Unsure**: Participants who rated it as unsure
- **Important**: Participants who rated it as important
- **Very important**: Participants who rated it as very important

**Barriers**
- 14 (78%)
- 0 (0%)
- 0 (0%)
- 4 (23%)
- 9 (64%)
- 1 (7%)

**Solutions**
- 14 (82%)
- 0 (0%)
- 1 (7%)
- 2 (14%)
- 10 (71%)
- 1 (7%)
“procedural failures” (eg, aseptic technique) and a 12.7% increase in “clinical errors” (eg, wrong dose). Furthermore, the study established the risk of a major error occurring doubled when four interruptions occurred. Therefore steps should be taken towards reducing interruptions and that the risks of errors associated with interruptions during a drug round should be reinforced.

Since drug administration is predominantly performed by nursing staff, systems are required to enable nurses to perform drug rounds safely. In an attempt to decrease the number of interruptions, Wirral University Teaching Hospital (WUTH) provided nurses with a red tabard (stating “Drug round in progress. Do not disturb”) to wear during drug administration rounds. Awareness of the tabards was promoted to existing staff by their ward manager and to all new trust employees by pharmacists during the medicines management induction presentation.

OBJECTIVES
- To determine whether nursing staff wear the red tabard.
- To determine whether nursing staff consider the red tabard to be effective in reducing interruptions.
- To determine whether other ward based healthcare professionals are aware of the red tabard system.
- To determine whether the red tabard deters healthcare professionals from interrupting nursing staff.

METHOD
A questionnaire using open and closed questions was piloted using three nurses before being issued to a further 82 nurses. At least two nurses were included from each ward in an attempt to gain a range of responses from different clinical specialties. Permission was granted by NHS Governance to allow the process of removing healthcare professionals from their duties to take part in the study. Critical care, theatres and the women’s and children wards were not included in the study since drug administration rounds are not performed at set times in these areas. A second questionnaire aimed at other healthcare professionals (eg, doctors, pharmacists, etc.) was issued to 20 individuals to evaluate their awareness of the system and whether it deterred them from interrupting nurses. Content analysis was used to analyse all collated data.

RESULTS
Eighty-two questionnaires (100%) were completed by nurses. Only 52% of nurses always wore the red tabard and only 13% thought it worked as a deterrent to interruptions. Table 1 summarises the nurses’ opinions of the system. There was a 100% response rate from other healthcare professionals (n=20) with 86% of respondents stating that they were aware of the red tabard system. However, only 56% stated that the system deterred them from interrupting the nursing staff.

DISCUSSION
The majority of nurses thought that the red tabard itself could not be improved, but the addition of one extra member of staff to the ward could offer them temporary release from their daily duties and allow them to complete drug administration rounds without interruptions. The main reason given by nurses for not wearing the tabards for all drug administration rounds was that they thought they compromised infection control, since they were not washed on a daily basis.

Purchasing disposable red tabards will allow high standards of hygiene to be maintained and could improve use of the tabards. Other studies have suggested that using red coloured disposable gloves during drug administration rounds may decrease interruptions. Furthermore, systems such as the red tabard will not work if the ward staffing levels are insufficient to address patient care needs and respond to queries whilst preventing the nurse administering medicines from being interrupted.

A small number of the other healthcare professionals stated that the system can work and theoretically, should be an effective way to reduce interruptions. However, other healthcare professionals need educating on the rationale for the system and their responsibility in helping to prevent errors during drug administration rounds. Although there are situations where the red tabard may be overlooked, for example, in an emergency situation, respect for the system needs to be enforced to improve its efficacy. A further avenue to explore would be to ask what healthcare professionals thought is a valid reason to disturb a nurse during a drug administration round.

A limitation of this study is that the questionnaire used asked whether nurses always wore the red tabard during medicine administration rounds. A more accurate assessment of how often the red tabard is used on the wards could be obtained using questions to elicit the frequency the nurses wore the red tabard. More nurses were included than other healthcare professionals since they were the main focal point and users of the red tabard system.

Table 1: Nurses’ opinions of the red tabard system

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Percentage of nurses (n=82)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highlighted positives</td>
<td>25.6</td>
</tr>
<tr>
<td>Can reduce interruptions</td>
<td>7.4</td>
</tr>
<tr>
<td>Empowers nurses to refer on interruptions</td>
<td></td>
</tr>
<tr>
<td>No benefits</td>
<td>63.1</td>
</tr>
<tr>
<td>No response given</td>
<td>8.6</td>
</tr>
<tr>
<td>No improvements possible</td>
<td>53.7</td>
</tr>
<tr>
<td>No response given</td>
<td>29.7</td>
</tr>
<tr>
<td>Suggested improvements</td>
<td></td>
</tr>
<tr>
<td>Educate others about the purpose of the red tabard</td>
<td>14.6</td>
</tr>
<tr>
<td>Create a disposable tabard to address infection control issues</td>
<td>7.3</td>
</tr>
<tr>
<td>Procedures should be installed to keep the red tabards clean</td>
<td>3.7</td>
</tr>
<tr>
<td>No improvements possible</td>
<td>53.7</td>
</tr>
<tr>
<td>No response given</td>
<td>29.7</td>
</tr>
</tbody>
</table>

REFERENCES
4. Orton J. Medicines Management Policy (General), Wirral University Teaching Hospital, 2009 version 9, p23.