NAPP PHARMACEUTICALS LTD PAIN AWARD 2012

Safer use of NSAIDs in primary care

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Non-steroidal anti-inflammatory drugs (NSAIDs) are widely used for both their analgesic and their anti-inflammatory properties. However, they are also known to have a range of serious side effects. Each year in the UK, NSAIDs cause about 3,500 hospitalisations for and 400 deaths from ulcer bleeding in patients aged 60 years or above.1 Studies of medicine-related hospital admissions have reported that NSAIDs are a common cause of admissions classed as potentially preventable.2 Problems included inadequate renal monitoring, inappropriate self-medication and, most frequently, inadequate gastrointestinal (GI) prophylaxis.3 Current guidance from the National Institute for Health and Clinical Excellence (for osteoarthritis, rheumatoid arthritis and people aged over 45 with chronic low back pain) is that GI prophylaxis should be co-prescribed for all patients treated with NSAIDs (including cyclo-oxygenase-2 selective inhibitors).

The pharmacy medicines use review (MUR) service is intended to improve patients’ knowledge and use of medicines, but the value of the service is unclear. Three key areas of NSAID safety identified in studies of preventable admissions could be addressed by MURs: co-prescription of GI prophylaxis, adherence with prophylaxis and self-medication with NSAIDs. Prior to this work, pilot prescription surveys confirmed there were ongoing problems with co-prescription and adherence to GI prophylaxis. A recent survey of patients with osteoarthritis also reported that 41% were not offered gastroprotective medication.1

OBJECTIVE

To evaluate whether the existing community pharmacy MUR service could be specifically targeted to improve NSAID safety in primary care, potentially preventing NSAID-related hospital admissions.

METHOD

Two groups at particular risk from regular NSAID use were identified: patients with inadequate GI prophylaxis and all patients aged over 55 years. Community pharmacists targeted these patients for MURs. The MUR included checking appropriate GI prophylaxis was in place, confirming patient understanding and adherence to GI prophylaxis, and discussing the risk of taking non-prescribed NSAIDs concurrently. For each MUR, pharmacists completed an anonymous data collection form. Seventeen pharmacies in Sussex and Hampshire took part, recruiting patients from January 2011 to March 2012. Ethics approval was not required.

RESULTS

142 patients on regular NSAIDs were reported, including nine who did not receive an MUR but were still followed up by the pharmacists because of safety concerns. The average patient age was 69 (range 20–90). One patient was prescribed two NSAIDs and six were taking both prescribed and non-prescribed NSAIDs prior to the MUR. Eighty-six patients were reported with inadequate GI prophylaxis four were non-adherent and 82 had no prophylaxis prescribed (see Table 1). Post-MUR follow-up was completed for 51 patients in this group: 23 had GI prophylaxis initiated, six discontinued NSAID treatment, four had a reduced NSAID dose, one was prescribed an alternative NSAID, eight had therapy reviewed but the prescriber/patient decided not to make any changes, and nine had no known review/changes. For the older patient group (56) with adequate GI prophylaxis, one patient was referred for a renal function check and one subsequently discontinued NSAID treatment.

DISCUSSION

Unintentional harms from medicines contribute to many hospital admissions with serious consequences for both patients and health resources. This work has demonstrated how MURs can contribute to the safe use of one commonly prescribed class of analgesic. Patients prescribed NSAIDs are now included within the national target MUR “high risk drug” group. Results from this study indicate that these MURs can make a significant contribution to medicines safety.

REFERENCES


NAPP PHARMACEUTICALS LTD ASTHMA AWARD 2012

An evaluation of practice by pharmacist independent prescribers working in asthma/COPD clinics in primary and secondary care

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In 2000, the Department of Health policy objectives for the development of non-medical prescribing (NMP) were to improve patient care, choice, access and patient safety through better use of health professionals’ skills and more flexible teams working across the NHS. Since 2006, pharmacists and nurses have been able to train to become independent prescribers. A recent evaluation indicates that, overall, nurse and pharmacist prescribing is safe and clinically appropriate. It is becoming a well integrated and established means of managing
To agree and test with the pharmacist prescribers a dataset for asthma/chronic obstructive pulmonary disease (COPD) patients that would allow the PIPs to undertake self-audit and peer review.

To analyse data to review the patients’ management by PIPs in line with agreed best practice.

METHOD

All primary care trust and chief pharmacists in the South East of England were contacted to help identify practising pharmacist independent prescribers. PIPs working in respiratory clinics were approached and asked to participate on a voluntary basis. The project lead worked collaboratively with the volunteers to agree a dataset specific to asthma/COPD patients. Minor amendments were made following a two-week pilot. All patients with asthma and stable COPD seen in each clinic session were included in the data collection. Data were collected prospectively over six months. Individuals agreed to review their own practice in line with the mutually agreed final dataset by a process of peer review. Patient assessment had to be manageable within the clinic time available.

RESULTS

Four PIPs were recruited (three working in primary care settings and one in secondary care). Following the pilot the dataset was reviewed and amended by the practitioners. Between October 2011 and March 2012, data were collected for a total of 168 patients: 96 with asthma and 72 with COPD.

Of the asthma patients, 36% were at BTS step 4 or 5 and 66% with an asthma control test (ACT) of <19, indicating poorly controlled asthma. Of the COPD patients, 38% were defined as severe or very severe based on forced expiratory volume (FEV1) rating. In the previous 12 months, 27% of the asthma patients and 24% of COPD patients had had three or more acute exacerbations. Table 1 outlines the findings. Data were provided for most of the agreed parameters. Inhaler technique was discussed with 86% of asthma patients and 88% of COPD patients, with inhaler technique assessed in 75% of asthma patients and 78% of COPD patients. General adherence issues were also discussed in 67–69% of patients. Based on severity of airways disease and patient symptoms, the PIPs reviewed whether the drug therapy was appropriate. In 41% of asthma patients and 19% of COPD patients, it was assessed as not appropriate and changes to therapy were made. A large proportion of these were stepping down or stopping therapy, and increased adherence to trials targets. Advice Asthma Data not COPD Data not

Advice provided

Inhaler technique discussed 83 (86%) 7 63 (88%) 3
Inhaler technique assessment undertaken 72 (75%) – 56 (78%) –
General adherence issues discussed and guidance provided 64 (67%) 1 50 (65%) 1
Drug therapy inappropriate* and amended 39 (41%) 1 14 (19%) 3
Eligible for rescue packs 33 0 29 0
Access to rescue packs checked 29 (35%) 0 25 (36%) 0
Flu/pneumococcal vaccination status checked 68 (82%) 0 71 (99%) 0
Referral for vaccination offered where applicable 14/15 0 10/11 0
Smoking cessation offered where appropriate 64/75 (85%) 1 27/29 (93%) 0

*according to severity of airways disease, national guidelines and patient symptoms

DISCUSSION

The process of agreeing a dataset prior to data collection allowed individual practitioners to review their practice with respect to national guidance and their peers. Patient assessment and recording of data were found to be manageable within the clinic time available. The results show that PIPs are placed to manage patients with co-morbidities. T his quality improvement project was developed to support pharmacist prescribers to review this practice.

AIM

To develop and test a tool that enabled pharmacist independent prescribers (PIPs) to examine their practice in relation to perceived best practice.

OBJECTIVES

■ To agree and test with the pharmacist prescribers a dataset for asthma/chronic obstructive pulmonary disease (COPD) patients that would allow the PIPs to undertake self-audit and peer review.

■ To analyse data to review the patients’ management by PIPs in line with agreed best practice.

METHOD

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OBJECTIVES

Inhaler techniques and general adherence issues are addressed and are well placed to manage patients with co-morbidities. The frequency of patient attendance and the time available for data collection meant that data were only collected once for each patient. Future work would be to extend the data collection period to allow patients’ management to be measured over time.
Wards were chosen based on the results of the 2009 PPS. Each cycle was a snapshot audit on one day. Pharmacy screened all antimicrobial prescriptions for compliance with the standards. Data collected included: ward, name of antibiotic and whether it was classified as restricted or not, presence or absence of indication and course length on the drug chart or in the notes, and whether the IV/PO switch was overdue according to our criteria. Sensitivities and any advice from medical microbiology were also recorded. After each audit, pharmacy and medical microbiology fed back the results (overall and specific to wards) to the antimicrobial prescribing team. Consultants were asked to make sure that the information reached their juniors. The chi-squared statistic was used to determine the significance of the improvements between Cycle 1 and Cycle 4. Because these were audits, ethics approval was not required.

RESULTS

Results of all four cycles are displayed in Table 1. The IV/PO switch was within target at the beginning of the audits and stayed that way. The only other targets that were reached overall were the prescriptions of antimicrobials according to guidelines or medical microbiology advice. However, performance on all targets except IV/PO switch increased significantly between the first and fourth cycles.

DISCUSSION

Although most of the standards did not reach their targets, regular, focused auditing with rapid feedback before the next audit cycle significantly improved antimicrobial prescribing. Some specialisms improved more than others. The success of this work led to the adoption of three antimicrobial key performance indicators (KPIs) onto the trust scorecard — IV/PO switch not overdue, documentation of the stop or review date and documentation of the indication. Data on the KPIs is now collected by junior doctors monthly. The trust and specialism-specific results appear on the scorecard monthly and are discussed at clinical governance and infection control meetings. The improvements have been sustained and now routinely reach target levels.

REFERENCES


SANOFI DIABETES AWARD 2012

Development of e-prescribing to improve safety of insulin and anti-diabetic medications

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Errors relating to diabetic medication errors are high profile locally and nationally for a number of reasons. National drivers are: the NPSA rapid response alert on safer administration of insulin; the Think Glucose campaign; and the national inpatient diabetic audit. Local drivers are: a local serious untoward incident relating to insulin that resulted in a coroner’s case; incident reports of hypoglycaemia relating to sulfonylurea, biphasic and rapid acting insulin administration after 10pm; lack of knowledge from medical and nursing staff about insulins and oral anti-diabetes medications; and the trust was set a Commissioning for Quality and Innovation target to demonstrate a 5% reduction in insulin and other diabetic medication errors.

In response to the local and national drivers HEFT established a trust-wide multidisciplinary group called DECIDE (Delivering Excellent Care to Inpatients with DiabEtes). A decision was made to use the electronic prescribing system that is available across the trust on approximately 80% of the available 1,500 beds to help improve insulin and oral anti-diabetes medication safety.

AIM

To improve patient safety with improved electronic prescribing of insulin and oral anti-diabetes medications.

OBJECTIVES

To demonstrate a 5% reduction in insulin and other diabetic medication errors compared with baseline data from quarter 3 of 2009/2010.

METHOD

A baseline audit using data collected from the electronic prescribing system was undertaken by the DECIDE group. This highlighted three main categories of diabetic medication (insulins and oral antidiabetes medications) errors: late prescription — insulin or oral antidiabetes medication prescribed to be administered after 10pm and before 6am (intermediate and long acting insulins were excluded); late administration — diabetic medication administered between 11pm and 6am; and delayed administration — diabetic medication administered more than 120 minutes after the time it was prescribed to be administered.

To overcome these problems the DECIDE group and the electronic prescribing team undertook a comprehensive review of all diabetic medication prescribing. Diabetic medication protocols were developed to assist prescribers in selecting appropriate meal based timing of administration of diabetic medicines and to help nurses to understand that insulins and oral anti-diabetes medications should be given at meal-times. The insulin device was removed from the prescribing selection list as this was frequently prescribed incorrectly.

The pharmacy team as part of the drug history were asked to add a note to the insulin specifying the correct insulin device.

Three new meal based frequencies were introduced to the e-prescribing system, which were breakfast, lunch and evening meal.

Each protocol had a consistent naming convention and was assigned a default administration time in line with one of the new meal based frequencies.
An “unknown insulin” option and free-text prescription was made available should the protocol required not be on the e-prescribing system.

To assist with the change in practice, the training was provided to prescribers by the pharmacy and diabetes teams on how to prescribe diabetic protocols on the trust e-prescribing system. In addition, quick guides were produced for medical staff with how to use these protocols and basic information was also included on duration of action of the different groups of insulins, mechanism of action of oral antidiabetes medications and key prescribing points.

A report to obtain the data from the e-prescribing system was written to collect the three types of error at monthly intervals. Ethics approval was not required as the data obtained in the reports were anonymous. A number of actions had already been undertaken by the DECIDE group in 2009–10 so it was decided to use January 2011 as the baseline to establish the error rate. Each month the data were collated, analysed and reported at the monthly DECIDE meetings and HEFT drugs and therapeutics committee.

**RESULTS**

The baseline data obtained in January 2011 showed trust activity of approximately 2,000 prescriptions and 20,000 administrations of diabetic medications per month, with 11.9% of prescriptions having a diabetic medication error. The e-prescribing diabetic protocols were introduced in early April 2011 (quarter 1) and from the results in Table 1 there was a sustained reduction in the number of total errors (defined as late prescription, late administration and delayed administration). Figure 1 demonstrates there was a significant reduction in “late prescriptions”. The numbers of late or delayed administration has remained consistent and demonstrates no change since the introduction of the diabetic protocols.

**DISCUSSION**

The introduction of diabetic protocols on the trust e-prescribing system showed a significant reduction in the total number of diabetic errors. In particular there has been a sustained improvement in more appropriate prescribing times for insulins and oral anti-diabetes medications. This in turn has helped the trust to demonstrate how it has met the challenge of a diabetes focused CQUIN target.

A weekly report has also been generated which provides the DECIDE group with details of which prescribers have prescribed “off protocol”. This has enabled the diabetes team to provide direct feedback and learning to individual doctors.

During this process the trust DECIDE group was working on a number of projects to make diabetes and diabetic medicines high profile within the trust, increasing awareness of the condition and the need for safe prescribing. This additional work could have helped to contribute in part to the large reduction in diabetic errors over the year.

Although the diabetic protocols have helped resolve inappropriate timing of insulins and oral antidiabetes medications, there is more work to be undertaken to resolve the issues of delayed administration of these medications.

**REFERENCES**


**UKCPA EDUCATION AND TRAINING AWARD 2012**

A collaborative approach to taking e-learning forward in CPPE: Repurposing resources for the online synchronous environment

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The Centre for Pharmacy Postgraduate Education (CPPE) employs 80 tutors nationwide to deliver four different types of face-to-face evening workshops to the pharmacy workforce. The pedagogy of these events is founded on the construction of knowledge within a group, or social constructivism. Time and travel are still major challenges facing pharmacists and pharmacy technicians to access this face-to-face resource. To increase the accessibility to this type of postgraduate education, a group of six CPPE tutors (project tutors) embraced the challenge to repurpose, or to give a “new purpose to”, a CPPE focal point (FP) workshop to the online environment.

Participatory action research (PAR) is a collaborative research method, popular in educational research, which also embraces social constructivist epistemology. This congruence meant it was a method of choice for the repurposing of both the project tutors and the CPPE FP workshop material to the online environment. In addition to the construction of knowledge within a group, PAR must also empower participants to use their knowledge. WebEx is the online platform used for this project.

**OBJECTIVES**

- To repurpose CPPE resources, namely CPPE tutors and a CPPE FP workshop, to the online synchronous environment.
- To determine CPPE tutors’ perception of e-workshops, namely advantages of this mode of learning.

**METHOD**

On 7 February 2011, the tutor group designed a collaborative five-month project plan that involved the design and implementation of an online workshop. To align with the pedagogy of CPPE workshops, interaction between participants was considered to be a key feature of the online event. To facilitate the collaborative PAR process, a wiki (shared internet site) was used to host the iterative reflective process within the group. The five-month project was divided into two stages: stage 1 involved training in WebEx, review of CPPE learning materials and a WebEx meeting to design outline of e-workshop; stage 2 comprised three trial events run within the project tutor group, three pilot events each attended by three CPPE tutors external to the project tutors, and a focus group gathering reflections from the project tutors.
Ethical approval for this research process was sought and granted by the University of Leeds.

RESULTS

A CPPE asthma FP online workshop was created and underwent a trial and pilot phase. Four e-workshop taster sessions were subsequently run at the CPPE national conference in October 2011 to present the e-workshop outline and recruit a potential e-tutor cohort. The 44 tutors attending the sessions were surveyed to determine their perception of e-workshops. As tutors chose to attend the session, it was perhaps unsurprising that 96% of the surveyed tutors agreed that CPPE should have live online learning as part of its learning portfolio. It was interesting to note that the top five areas that the tutors considered essential were congruent with the repurposed workshop (Table 1).

The top five potential audience categories for e-workshops were ranked as the following: technology-minded individuals 77%; “younger” pharmacists/technicians (newly qualified) 75%; preregistration pharmacists 64%; pharmacists/technicians in rural areas 55%; anyone with family commitments in the evening 52%.

The momentum created by this project led to CPPE trialling five interactive e-workshops for the postgraduate pharmacy workforce throughout February and March 2012.

DISCUSSION

Throughout this project there were key learning points that are transferable to other areas of research in pharmacy education:

- The experience of practitioners can be harnessed through the collaboration to create innovative educational solutions.
- To successfully repurpose learning material to another environment, it is essential that the underlying pedagogy of the event is considered.
- Participatory action research appears to be an excellent method to empower participants, create knowledge and provide momentum for new initiatives.
- Interactive online workshops appear to be an educational solution that can increase the accessibility of postgraduate education within the pharmacy workforce.

Acknowledgments: Field M, Greensmith S, Ridgeway-Green S, Taylor B, Wragg K (CPPE Tutor Group); Bradbury H, O’Rourke R (University of Leeds)

REFERENCES


HAMELN ORAL COMMUNICATION AWARD

The impact of including a heart failure specialist pharmacist on the inpatient heart failure service: a pilot study

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Approximately 900,000 people in the UK have heart failure (HF): almost as many have damaged hearts but, as yet, no symptoms. HF accounts for approximately one million inpatient bed days, 2% of all NHS inpatient bed days and 5% of all emergency admissions.1 The total annual cost to the NHS is around 2% of the total NHS budget, with 70% of this due to the costs of hospital admission,2,3 and readmissions are common.4

At the Countess of Chester Hospital NHS Foundation Trust (COCH), the inpatient heart failure service was reviewed and redesigned in order to improve the management of this patient group. The service was supported by developing a heart failure specialist pharmacist (HFSP) role in addition to the existing specialist nurse role (HFSN). The redesign aimed to develop the service from one that focused on patient counselling, to a more proactive service which included clinical assessment and prescribing by the specialist nurse and pharmacist leading the service. The HFSP also provided clinical advice to the Community Heart Failure team.

OBJECTIVES

The aim of the project was to improve the care of heart failure patients and improve a number of measures to demonstrate this. The objectives of the service redesign were to evaluate the impact of the service redesign on length of stay and associated costs and savings, readmission rate, the number of patients counselled about their heart failure medication, and follow-up and prescribing for patients during their inpatient stay.

METHOD

Baseline data collection established current rates of patient length of stay (LOS) and readmissions which were then compared to a post-implemention period. The HFSP and HFSN underwent training as independent prescribers and the HFSP also undertook a clinical examination course. Both comparative data assessed patients with left ventricular systolic dysfunction (LVSD) who were referred to the heart failure service from October 2010 to June 2011 and following service redesign in October 2011 to June 2012. Data were collated from the hospital information system (Meditech) and analysed by a trust information analyst. Data on prescribing, interventions, visit numbers and counselling were obtained from data captured in the Heart Failure Care Plan on Meditech.

RESULTS

The number of patients referred to the heart failure team with LVSD was 252 in 2010–11 compared to 187 in 2011–12 and the mean LOS remained unchanged at 16 days. However, there was significant variation in the LOS between patients, probably due to the complexity of their condition. The patients seen in 2011–12 had a larger cohort of elderly (80–89 years) patients than those seen in 2010–11 (35.7% of patients in 2010–11, compared to 42.8% in 2011–12). Overall, readmissions were reduced, 15% were readmitted in 2010–11 compared to 11% in 2011–12 (Table 1).

With regard to the HFSP prescribing role, the number of new drug initiations for the HFSP and HFSN increased over the 9 months as confidence and experience grew. Of prescriptions written by the HFSP and HFSN, the HFSP was responsible for 64% of initiations and 63% of dose adjustments during this time. Compliance with the trust’s “Advancing quality” patient counselling targets was achieved in 2011–12 with improved rates compared to 2010–11.

The HFSP recorded 57 clinical interventions in the evaluation period, including stopping of contraindicated medications, dealing with adverse drug reactions, incorrect dosing and drug interactions. In addition, HFSP referred several acutely unwell patients to a cardiologist, many of which resulted in transfers to a cardiology ward for specialist treatment.

DISCUSSION

Patient numbers were lower in 2011–12, which may be partly explained by fewer patients being readmitted during that time. Although there was an overall reduction in readmissions, those within 30 days of discharge showed a small increase which requires further investigation. The LOS remained largely unchanged, which, given that the 2011–12 cohort had a greater proportion of older patients, could be viewed as a positive development. Work is needed to investigate this further in order to exclude social and non-HF related extensions in LOS. The clinical interventions show the additional benefit of a cardiologist pharmacist in the HF team as these might not otherwise have been identified by more generalist staff.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage (n=44)</th>
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<tbody>
<tr>
<td>Flexible timing (e.g., weekends, daytime)</td>
<td>50%</td>
</tr>
<tr>
<td>Interaction between participants</td>
<td>45%</td>
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<tr>
<td>Nationally run (suspending to local issues)</td>
<td>36%</td>
</tr>
<tr>
<td>Run by specialist webinar tutors</td>
<td>27%</td>
</tr>
<tr>
<td>Have the opportunity to role play</td>
<td>23%</td>
</tr>
</tbody>
</table>

Table 1: Essential characteristics of e-workshops

1. Field M, Greensmith S, Ridgeway Green S, Taylor B, Wragg K (CPPE Tutor Group); Bradbury H, O’Rourke R (University of Leeds)
Further evaluation is required to increase the robustness of the conclusions drawn from the data thus far and to challenge the assumption that prescribing results in a corresponding improvement in the patient's condition. A more detailed audit using individual case analysis would help to clarify this assumption.

The service redesign generated an advanced model of practice in which a pharmacist has stepped out of their traditional role, and taken on new prescribing and physical examination skills in a complex patient group. This project demonstrates an advance that is good for patients, good for the trust and good for the development of individual practitioners and their colleagues. Following the success of this work, the pharmacist's role will be extended to provide an OPD clinic for the initial assessment of suspected HF patients from primary care, supporting NICE recommendations.

<table>
<thead>
<tr>
<th>Table 1: Variation in length of stay and readmission rates</th>
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<tbody>
<tr>
<td><strong>Length of stay (days)</strong></td>
</tr>
<tr>
<td>25th percentile (1st quartile)</td>
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<tr>
<td>50th percentile</td>
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<tr>
<td>75th percentile</td>
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<tr>
<td>95th percentile</td>
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<tr>
<td>Readmissions (as % of total)</td>
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<tr>
<td>Readmission over 30 days</td>
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<td>Grand total</td>
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<table>
<thead>
<tr>
<th>Table 1: Most common contributors that resulted in poor compliance to the standards</th>
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</thead>
<tbody>
<tr>
<td><strong>Standard</strong></td>
</tr>
<tr>
<td>Legibility</td>
</tr>
<tr>
<td>Patient's address</td>
</tr>
<tr>
<td>Clinical information</td>
</tr>
<tr>
<td>Weight if required to determine dose</td>
</tr>
<tr>
<td>Allergy status complete</td>
</tr>
<tr>
<td>Approved drug name</td>
</tr>
<tr>
<td>Legibility and clarity</td>
</tr>
<tr>
<td>Appropriate cross-referencing of drug charts</td>
</tr>
<tr>
<td>Appropriate discontinuation of drugs</td>
</tr>
<tr>
<td>Other issues</td>
</tr>
<tr>
<td>Medication prescribed on current drug chart</td>
</tr>
<tr>
<td>Medication prescribed on correct section of the drug chart</td>
</tr>
</tbody>
</table>

**STANDARDS**

- 100% of prescriptions should be legal. This includes the following requirements: patient’s full name, age if less than 16, date of birth, doctor’s signature, written in indelible ink and dated within six months.
- 100% of clinical information should be complete. This includes the following requirements: patient’s current weight if less than 16 years, approved medicine name/specific brand, the dose and frequency of administration, the date and route of administration, and allergy status.
- 100% of prescriptions should be legible and clear. This includes the following requirements: units written in full, appropriate use of decimal places, cross-referencing of drug charts, clear discontinuation of drugs, and new prescriptions for changed dose/route.

**METHOD**

The audit was prospective and carried out over a two-week period in June 2011; data were collected by the author only. A data collection form was used to collect the data and results were collated manually and then entered into a Microsoft Excel spreadsheet for analysis. All the drug charts available at the time of data collection were used for the audit and all the drug charts were only audited once. The most recent prescription or the one where the last supply was made was audited; therefore all other previous prescriptions if on the same drug chart were excluded from the audit. Prior to data collection a pilot was undertaken on 10 drug charts. Ethical approval was not required for this audit to be completed.

**RESULTS**

In total 91 charts were audited over the total data collection period. Of these 25% (n=23) were legal, 22% (n=20) were clinically complete and 80% (n=73) were legible and clear. Table 1 illustrates the most common contributors that resulted in poor compliance to the three standards.

**DISCUSSION**

The audit found that the standard of prescribing of medications on MIDU was poor and did not follow the trust policy and procedure. None of the three standards had 100% compliance. This could lead to potential errors and compromises safety.

Prescriptions being out of date means that the pharmacist screening does not know if the dose or treatment is still appropriate for the patient, while charts missing addressographs could potentially lead to the wrong patient receiving the medication. Often referral letters attached to the drug chart containing some patient details were used to help identify the patient; this is an unsatisfactory practice. Without the weight of the patient, a pharmacist screening the drug chart would be unable to determine if the dose is correct for that patient, and hence be unable to clinically check the prescription. An incomplete allergy status is of great potential risk to the patient, as this could potentially harm the patient if the patient does have a true allergy and this is not documented. Not having the correct approved name of the medication or brand specified could possibly compromise patient safety as the incorrect medication could be administered to the patient. The most up-to-date trust-
approved version of the drug chart should be used to ensure safety to the
patient and correct prescribing. Prescriptions were incorrectly being
prescribed in the wrong section of the drug chart, which resulted in clinical
information being missing from the prescription, leaving the prescription
incomplete and ambiguous.

The following recommendations are made to improve compliance to TPP
107:

- Educate doctors, nurses and pharmacists about the policy and NPQA alert
- Devise a drug chart to allow for a prescription to be valid for only six
  months, as well as reformating the drug chart specific for this clinical area
to allow for all legal and clinical information to be completed
- Re-audit annually to see if the prescribing standards have improved in
  MIDU

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HAMELN BEST POSTER AWARD

An audit of vancomycin levels in paediatric medical and oncology
patients

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Complex pharmacokinetics, coupled with its use in severe infections, warrants
careful prescribing and close monitoring of intravenous vancomycin. Achieving
target vancomycin levels promptly is important to avoid the risks associated
with subtherapeutic levels, including untreated infection, emergence of
resistance and increased hospital stay. The British National Formulary for
Children (BNFC) recommends an initial dosing regimen of 15mg/kg three
times daily (tds), then doses adjusted to reach a plasma concentration of
10–15mg/L or 15–20 mg/L. Levels that are very low, under 5mg/L, have been
associated with emergence of resistance and risk of relapse and therefore may
be related to poor therapeutic outcome. This evidence, in combination with
anecdotal reports of under-dosing, has prompted the emergence of numerous
guidelines across UK hospital trusts.

OBJECTIVES
The aim of the audit was to monitor compliance with 15mg/kg tds dosing as
per current guidelines and to assess whether current practice yields satisfactory
target vancomycin levels.

METHODS
The audit sample included paediatric (one month to 16 years) medicine and
oncology patients on intravenous vancomycin at Leeds Teaching Hospitals
Trust (LTHT) between January 2010 and December 2011. Patients with an
estimated glomerular filtration rate (eGFR) under 60ml/min were excluded, as
were those in whom levels were not taken immediately before the third dose.
Patients were identified using central computer server records. Data were
collected retrospectively using a standardised form from information in the
patient’s medical records and the computerised results server. Ethical approval
was not required; however, work was carried out within an ethical framework
and care taken to protect patient confidentiality.

RESULTS
The audit sample included a total of 31 courses in 29 patients, in which 73 pre-
dose vancomycin levels were taken throughout the treatment courses. Twenty-
nine (94%) intravenous vancomycin prescriptions complied with current dosing
guideline of an initial dose regimen of 15mg/kg tds. Two (7%) of these 29
courses achieved therapeutic target level with these current dosing guidelines
(see Table 1). In six courses with subtherapeutic levels, the frequency remained
at tds but the dosage was increased to an average of 17.2mg/kg. This led to
therapeutic levels in two courses and led to one supratherapeutic level. In nine
courses with subtherapeutic levels the frequency was increased to four times a
day (qds) while keeping the dose at 15mg/kg. This led to a therapeutic level in
three courses. In six of the original courses with subtherapeutic levels, both the
frequency was increased to qds and the dose increased to a mean of 18.3mg/kg.
This led to one having therapeutic levels and one supratherapeutic level. Six of
the original courses that did not reach therapeutic levels on 15mg/kg tds were
stopped after a single level. Two patients started at 15mg/kg qds (in each case, previous
courses of vancomycin had required more than the standard 15mg/kg tds); one of these achieved therapeutic levels at this dose, the other required a
dose increase to 26mg/kg qds to achieve therapeutic levels.

Of the 15 full length treatment courses reached therapeutic levels (other courses either did not reach therapeutic levels or were stopped early and
alternative therapy initiated). Of the 15 that reached therapeutic levels, five
(33%) required two or more levels and dose adjustments. The doses that
achieved therapeutic levels ranged from 45 to 117mg/kg/day, with a mean of
71mg/kg/day.

CONCLUSION
It is recommended that pre-dose vancomycin levels be maintained above
10mg/L to prevent the emergence of resistant bacteria. However, the
literature suggests that 40% of patients are at risk of underdosing when current
guidelines are followed. Other literature suggests patients are at risk of
underdosing from regimes providing 40–45mg/kg/day vancomycin. Our
experience in paediatric patients (with eGFR >60ml/min) suggests even fewer
patients achieve therapeutic levels at a dose of 15mg/kg tds. Considerable
adjustment of dosage was required to achieve target levels and in many patients
it was necessary to increase the frequency of administration. Initial
subtherapeutic levels and length of time to reach target increase the likelihood
of resistance, which increases length of hospital stay, cost of healthcare and risk
to the patient. Supratherapeutic levels were infrequent and no significant
increase in supratherapeutic levels was found when the frequency of
administration was increased. This agrees with the study by Frymoyer, which
reported that a hospital-wide increase in vancomycin dosing from
45mg/kg/day to 60mg/kg/day did not significantly increase the number of
supratherapeutic levels. We plan to introduce initial dosing at 15mg/kg qds and
to re-audit. The data could be combined with data from other trusts across the
country and used to generate a large enough sample size in order to challenge the
BNFC dosing schedule.

It has been suggested that a continuous infusion optimises exposure of
bacteria to levels of vancomycin above the minimum inhibitory concentration
(MIC). Although frequently used in the neonatal population, continuous
infusions are not commonly employed in paediatric patients. Further work
needs to be undertaken to establish the place of continuous infusions. A
limitation of the audit was that, due to the small sample size, data could not be
separated according to age group. Therefore, it has not been possible to
determine how the changes in pharmacokinetics with age affect the
achievement of target vancomycin levels for patients in the study.

Table 1: Summary of initial vancomycin levels and levels after first dose increase

<table>
<thead>
<tr>
<th>Dose</th>
<th>Number of courses</th>
<th>Number of pre-dose plasma levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial dose 15mg/kg tds</td>
<td>29</td>
<td>2</td>
</tr>
<tr>
<td>After low vancomycin level and then frequency adjusted to 15mg/kg qds</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>After low vancomycin level and then mg/kg dose increased — remaining tds</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>After low vancomycin level both dose (mg/kg) and frequency increased to qds</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>
REFERENCES

PFIZER BEST PREREGISTRATION POSTER AWARD
An audit to assess compliance to trust guidelines for the use of morphine and fentanyl intravenous PCA
Radford L (supervisor Lam A) Barts Health NHS Trust

Patient-controlled analgesia (PCA) enables patients to titrate their own analgesic dose according to their level of pain. Using an intravenous opioid infusion, patients self-administer small bolus doses when required. PCA regimes individualise analgesia, improving pain control and outcomes post-operatively, as well as reduce nursing workload. 1

A fentanyl PCA infusion bag costs nearly three times more than morphine, per millilitre. The Barts Health NHS Trust must continually provide excellent standards of patient care, with limited funds, therefore it is necessary to rationalise prescribing of fentanyl PCAs to facilitate efficient use of resources. The trust recently relaunched PCA usage guidelines, promoting morphine as the first-line opioid and fentanyl as the second-line, only for consideration in these specific circumstances: severe renal impairment; allergy or intolerance to morphine; morphine has been ineffective.

AIM
To assess the level of compliance to trust guidelines for use of morphine and fentanyl PCAs

OBJECTIVES
■ To quantify prescribing of morphine and fentanyl PCAs
■ To determine the number of patients who received a fentanyl PCA compliant with guidelines
■ To determine the reasons for fentanyl PCA usage not compliant with guidelines
■ To estimate the excess costs from non-compliant uses of fentanyl PCAs

STANDARDS
■ 100% of patients receiving PCA should receive morphine except where patient has severe renal impairment (creatinine clearance [CrCl] <30ml/min); patient has an allergy or intolerance to morphine; or morphine has been ineffective in managing pain (pain score 2+ for >1 hour)
■ 100% of fentanyl PCA usages should be justified by one of the above reasons

METHOD
Prior to data collection, information governance approval was obtained. In November 2011, prospective data was captured on adult surgical wards over 10 days. Patients receiving PCA post-operatively were identified through liaison with ward pharmacists and nurses. Data was primarily collected in the afternoons to capture patients from morning surgery. The opioid used was identified from the PCA prescription sticker on the drug chart. For patients receiving fentanyl, the reason for selection was identified from the notes, anaesthetic record, observation chart, allergy status or calculation of pre-operative renal function. Patients were followed while receiving PCA, and reasons for morphine to fentanyl switches recorded.

RESULTS
Fifty-seven patients prescribed PCA were audited; 33 (58%) received morphine and 24 (42%) received fentanyl. Of the 24 fentanyl PCAs, 19 patients were started on fentanyl and five were switched from morphine to fentanyl. Only nine of the 24 fentanyl PCAs (37.5%) were selected for reasons specified in the PCA usage guidelines, as summarised in Table 1. If morphine had been selected in all patients who received fentanyl not compliant with guidelines, over 10 days, cost savings of £95.25 were possible, projecting to annual savings of £3,500.

DISCUSSION
The guidelines state that fentanyl should be selected for patients with severe renal impairment, quantified in this audit as CrCl <30ml/min. In seven patients with mild to moderate renal impairment (CrCl 31–70ml/min), a fentanyl PCA was selected. These patients had sufficient renal function to safely initiate morphine and were considered inappropriate fentanyl uses. At such levels of renal function, lower morphine doses can be used to limit accumulation of the active morphine metabolite. However, prescribers may have been cautious in these patients, selecting fentanyl due to the possibility of a post-operative dip in renal function.

In three patients, oral morphine, administered prior to PCA, caused drowsiness, hence fentanyl was selected. Drowsiness is a side effect not limited to morphine, occurring across the opioid class and can be dose related. 2 This alone is not an appropriate reason for fentanyl selection and morphine should have been the preferred choice, starting at lower doses.

Fentanyl-containing epidurals dislodged in two patients, requiring initiation of PCA. Fentanyl was selected for continuation of therapy. However, fentanyl is the only epidural opioid used in the trust and morphine should still be considered first.

Mild hepatic impairment was the basis for fentanyl selection in one patient. Morphine and fentanyl are both subject to high levels of hepatic metabolism, therefore both may accumulate in impairment and as such, there is no consensus on the preferred opioid choice. 3

One patient expressed a previous good experience with fentanyl PCA, so was selected again, outside of the guidelines. In another, no obvious reason for choice could be identified.

CONCLUSIONS
This audit highlighted that the use of fentanyl PCAs in post-operative pain does not comply 100% with trust guidelines. There is scope to improve compliance, to facilitate cost savings, without compromising patient care.

Trust guidelines could be improved by stating a CrCl below which fentanyl should be considered, by advising lower initial morphine doses in mild to moderate renal impairment and by considering the possibility of post-operative dips in renal function. Continued training should be provided to prescribers, including how to optimise morphine dosing. Re-audit is required to complete the audit cycle and to assess if improvements in compliance have occurred.

REFERENCES

Table 1: Reasons for fentanyl PCA selections

<table>
<thead>
<tr>
<th>Reason for fentanyl selection</th>
<th>Number of fentanyl PCAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe renal impairment (CrCl &lt;30ml/min)</td>
<td>3</td>
</tr>
<tr>
<td>Allergy or intolerance to morphine</td>
<td>2</td>
</tr>
<tr>
<td>Morphine has been ineffective</td>
<td>1</td>
</tr>
<tr>
<td>Reason non-compliant/unknown</td>
<td>15 (62.5%)</td>
</tr>
</tbody>
</table>

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The prevalence of inappropriate prescribing in acutely unwell older people

Onatade R*, Modha P†, Fernando J*, Knight E*, Maryniak E*
*Pharmacy Department, King’s College Hospital NHS Foundation Trust, London; †University College London School of Pharmacy

A potentially inappropriate medicine (PIM) is defined as a medication that generally should be avoided among patients 65 years or older. The use of PIMs in older people involves a greater risk of mortality and morbidity, and increased healthcare costs.1 The Screening Tool of Older Persons’ Potentially Inappropriate Prescriptions (STOPP) classifies 65 common drug issues found to contribute to potentially inappropriate prescribing (PIP) to highlight PIMs in the elderly.2 International studies indicate high PIM prevalence rates. The prevalence of inappropriate prescribing in older people in UK hospitals settings is unknown.

OBJECTIVES
The primary objective was to determine the prevalence and types of PIMs in older people at admission to, and on discharge from, an acute UK teaching hospital. A secondary objective was to compare prescribing between geriatric and non-geriatric wards.

METHOD
This retrospective study was set in a 950-bed acute teaching hospital trust with electronic prescribing and electronic patient records (EPR). Patients 65 years or above discharged from the hospital during the study timeframe were eligible. All discharges from the specialist Healthcare of the Ageing Unit (HAU) between 30 May 2011 and 31 July 2011 were selected. Four hundred patients discharged from the acute non-HAU wards between 27 June 2011 and 31 July 2011 were additionally randomly selected. An a priori sample size calculation indicated that 300 patients would provide a 95% confidence interval of ±3.

Patients were excluded if they died during admission or their medication orders and clinical records were not available electronically. Admission and discharge medication lists were reviewed for the presence of STOPP drugs. PASW (SPSS) v20 was used for statistical analysis. As this study was a service evaluation, ethics approval was not needed, in accordance with criteria.

RESULTS
Table 1 shows the patient and medication characteristics. HAU patients were older, had more medications and stayed in hospital for longer. In both groups of patients, PIMs were associated with a greater number of medications at admission and discharge (Spearman’s rho, p<0.01). Patients admitted to the HAU and taking more than 10 medications had more than double the likelihood of having a PIM compared to those prescribed 10 or fewer (OR = 2.3, 95% CI = 1.2–4.4). Standard multiple regression showed that neither age nor sex were independent predictors for PIMs in either group of patients. However, in HAU patients a longer stay plus polypharmacy predicted more PIMs. (R² increased from 0.056 (p = 0.012) to 0.069 (p = 0.009) after adding length of stay to the model). Both variables had small but significant effects. Older age was correlated with fewer medications at discharge from HAU (Spearman’s rho, p = 0.005), indicating the medication burden was lessened in the very old. In HAU patients at discharge, there was a significant reduction in the mean number of PIMs per patient compared to admission (paired samples t-test, p=0.005). The most common PIMs on admission to HAU were those associated with tricyclic antidepressants (TCAs), opiates and other drugs in patients at risk of falls, inappropriate alpha-blockers and duplicate drugs. By discharge, most PIM types were reduced or unchanged; however, inappropriate first generation antihistamines and opiates were increased. All long-term, high-dose proton-pump inhibitors (PPIs, three patients) and four out of duplicate duplicate drugs were stopped. In the non-HAU patients, PIM prevalence was highest in acute medical patients (39/111, 35% at admission and 41/111, 37% at discharge).

The likelihood of having a PIM at admission was significantly higher in medical patients than surgical (OR = 1.96, 95% CI = 1.02 to 3.8). There was a non-significant change in the number of PIMs per patient at discharge (paired samples t-test, p=0.152). The most common PIM in non-HAU patients, accounting for 34% and 35% of admission and discharge PIMs, respectively, was a high-dose PPI. Inappropriate prescriptions involving TCAs and antiplatelets were also common at admission and on discharge. Prescriptions for aspirin at doses greater than 150mg increased during admission.

DISCUSSION/CONCLUSION
This study provides baseline rates for the prevalence of PIMs in acute UK hospital. Prevalence was 26.7% in patients admitted to the specialist geriatric unit, reducing to 23% at discharge. Admission to the geriatric unit was associated with a statistically significant reduction in potentially inappropriate medication at discharge. This effect was not seen in over-65s treated in non-geriatric wards (27.1% reduced to 23.5%). The prevalence of PIMs was lower than published rates from outside the UK of 35% to 77%.2 Polypharmacy significantly increased the likelihood of having at least one potentially inappropriate medication. There is scope for community and hospital pharmacists to help improve medication appropriateness in our older patients by focusing on polypharmacy, PPIs, antiplatelet drugs and drugs affecting the central nervous system in the very old. Similar studies are needed in other acute UK settings.

REFERENCES
1 Gallagher PF, O’Connor MN, O’Mahony D. Prevention of potentially inappropriate prescribing for elderly patients: a randomized controlled trial using STOPP/START criteria. Clinical Pharmacology and Therapeutics 2011;89:945-54

An audit of the impact of an electronic prescribing system on antibiotic prescribing standards

Houston R, Green CF

Countess of Chester Hospital NHS Foundation Trust, Chester

Inappropriate use of broad-spectrum antibiotics is associated with increased selection of resistant organisms, an increased risk of adverse drug effects and a higher risk of antibiotic resistance.
Table 1. Antibiotic prescriptions with indication and stop/review date documented

<table>
<thead>
<tr>
<th></th>
<th>July 2011</th>
<th>September 2011</th>
<th>March 2012</th>
<th>June 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of antibiotic prescriptions</td>
<td>172</td>
<td>180</td>
<td>225</td>
<td>178</td>
</tr>
<tr>
<td>Number with indication documented</td>
<td>130</td>
<td>116</td>
<td>209</td>
<td>167</td>
</tr>
<tr>
<td>Percentage with indication documented</td>
<td>75.6%</td>
<td>64.4%</td>
<td>92.9%</td>
<td>93.8%</td>
</tr>
<tr>
<td>Number with course length documented</td>
<td>137</td>
<td>126</td>
<td>184</td>
<td>122</td>
</tr>
<tr>
<td>Percentage with course length documented</td>
<td>79.7%</td>
<td>70.0%</td>
<td>81.8%</td>
<td>68.5%</td>
</tr>
</tbody>
</table>

reactions and induction of _Clostridium difficile_ infection (CDI). Documentation of an indication and a stop/review date at the time of prescribing an antibiotic reduces the risk of inappropriately long antibiotic courses and enables clinicians to review and change treatment when appropriate. Our trust policy requires the documentation of an indication and stop/review date for all antimicrobials at the time of prescribing. Point prevalence audits are carried out every three months to monitor compliance with this policy.

An electronic prescribing (EP) system was implemented on all medical and surgical wards at the trust by the beginning of March 2012. A number of features were incorporated into the system to improve standards of antibiotic prescribing. This included a mandatory field for documentation of indication and automatic stop dates for all antibiotic prescriptions. Automatic stop dates are three days after initiation for intravenous antibiotics and five days for oral antibiotics. Prescribers are prompted to review the appropriateness of the automatic stop date and can change it if a longer course is required, or document a review date if this is more appropriate.

**OBJECTIVES**

To compare results of the antibiotic point prevalence audits before and after the implementation of EP to assess if there has been an improvement in documentation of indication and course length on antibiotic prescriptions. Trust policy states that 100% of antibiotic prescriptions should have an indication and stop/review date at the point of prescribing.

**METHODS**

Antibiotic point prevalence audits are undertaken every three months across the trust. Data are collected by ward pharmacists on all inpatient wards. Since the introduction of EP, data collection has been facilitated by the use of antibiotic prescribing reports generated for each ward. Each antibiotic prescription is reviewed for documentation of an indication and course length. Course length compliance can be achieved by the documentation of either a stop or review date on the prescription. Percentage compliance can then be calculated across the trust or for individual clinical areas or teams. Trust wide compliance was compared for EP wards before and after implementation. Ethics approval was not required for this audit work.

**RESULTS**

Table 1 shows results from the two audits prior to EP implementation and two audits after EP implementation. The table shows the number of antibiotic prescriptions, the percentage compliance with indication documentation and the percentage compliance with course length documentation.

**DISCUSSION**

The first audit following EP implementation showed an improvement in the documentation of both indication and stop/review date for antibiotic prescriptions; however, the second post-EP audit showed conflicting results.

In March 2012 the indication for antibiotic prescribing was documented on 92.9% of electronic prescriptions and this improvement was sustained at 93.8% in June 2012. Despite the mandatory field for documentation of an indication, 100% compliance has not been achieved due to an “other” option that allows prescribers to type in an indication that does not appear on the set list. Where prescribers selected “other” with no further information this was classed as non-compliance.

Following the introduction of EP, documentation of antibiotic course lengths improved to 81.8% in March 2012 but fell to 68.5% in June 2012 and compared to indication, compliance with course length is probably lower as it is not a mandatory field. This fall in compliance with documenting course lengths raises an interesting dilemma for the trust. With a few exceptions, all oral antibiotic therapy had pre-set course lengths of five days’ treatment and all intravenous antibiotics had a pre-set course length of three days, which the prescriber had to alter if they required something different.

Following a number of clinical incidents where doctors had accepted the standard course lengths without adequate arrangements for follow-up, in April 2012 the EP system was redesigned to flag up a warning screen to prescribers that a default stop date was in operation. It appears from the results of this audit that this is in fact prompting prescribers to remove the default stop date, and this is reflected in the results of the audit. This requires further investigation and a rethink on our strategy to manage antimicrobial prescribing, for example, whether to use the warning flag for intravenous antibiotics only.

Other methods for using the EP system to improve antibiotic prescribing are being explored to include the use of formulary comments to highlight antibiotics associated with a higher risk of CDI, and analysis of prescribing data to tackle areas that regularly use high risk antibiotics.

**REFERENCES**


The introduction of electronic prescribing (EP) is a complex and challenging programme but it is expected that it will deliver improvements in safety and efficiency. Research has highlighted the changing role of the pharmacist related to the introduction of EP; for example, it has been reported that pharmacists’ time was spent more on clinical duties with an EP system in place, compared to that of pharmacists without access to EP, and it has also been suggested that the implementation of EP leaves clinical pharmacists with more time to concentrate on patient-focused care.

The aim of the study was to investigate the impact of electronic prescribing on the daily activities of a ward pharmacist in particular whether the introduction of EP and subsequent reliance on computers affected the time available for the pharmacist to spend with patients.

**OBJECTIVES**

The objectives of the study were to identify differences in time spent directly with patients, using computers and in key clinical pharmacy activities.

**METHOD**

Data were collected over a five-month period from adult inpatient medical and surgical wards at the Countess of Chester Hospital using work sampling techniques. Twenty hours of data collection were carried out on medical and surgical wards prior to the roll-out of EP and 20 hours after giving a total of 80 hours of observations. The researchers carried a pre-programmed pager (Random Reminder, DeVilbiss Electronics) that...
The impact of including a heart failure specialist pharmacist on the in-patient heart failure service: a pilot study

Batem an J, Green CF
Pharmacy Department, Countess of Chester Hospital NHS Foundation Trust

Winner of Hameln Oral Communication Award (see pS3).

Delivering service improvements: productive pharmacy

Wilkes G, Jacques D, Rahman M
Nottingham University Hospitals (NUH) NHS Trust, Nottingham

Meditines management in hospitals encompasses the entire way that medicines are selected, procured, delivered, prescribed, administered and reviewed to optimise the contribution that medicines make to producing informed and desired outcomes of patient care.1

Pharmacy plays a key role in supporting the process change and improvement required to deliver the trust's medicines management agenda. An effective approach to change management and engagement of other trust groups and departments is essential for delivery of this agenda. Therefore this pharmacy department was keen to engage in the trust's whole hospital change programme, called "Better for you." The programme offered an opportunity to elevate the status of pharmacy within the hospital and provide the necessary framework to deliver a structured programme of improvement. The framework offered trust-wide commitment to tackle cross-cutting independencies. Initial scoping and consultation with staff identified areas with opportunity for improvement and potential for significant benefits. Three critical areas were identified:

- Stock management
- Dispensing
- Clinical (ward) services.

OBJECTIVES

To raise the profile of pharmacy within the organisation and deliver measurable improvements in stock management, dispensing and clinical (ward) services, using the trust's common approach to change management.

METHOD

The projects followed a structured five-step approach encompassing set-up and plan, discovery, design and trial, implementation and embed. The method followed lean and productive principles and was underpinned by:

- Dedicated project leads seconded from within the department
- A governance structure with clear lines of responsibility, reporting and escalation

Table 1: Breakdown of activities observed during the study reported as number of observations and percentage time

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinically checking prescription</td>
<td>126</td>
<td>82</td>
<td>94</td>
<td>51</td>
<td>220</td>
<td>133</td>
</tr>
<tr>
<td>(13.7%)</td>
<td>(12.8%)</td>
<td>(14.7%)</td>
<td>(8.0%)</td>
<td>(17.2%)</td>
<td>(10.4%)</td>
<td></td>
</tr>
<tr>
<td>Looking for drug chart/computer</td>
<td>48</td>
<td>1</td>
<td>11</td>
<td>2</td>
<td>59</td>
<td>3</td>
</tr>
<tr>
<td>(7.5%)</td>
<td>(10.2%)</td>
<td>(1.7%)</td>
<td>(0.3%)</td>
<td>(4.0%)</td>
<td>(0.2%)</td>
<td>(0.2%)</td>
</tr>
<tr>
<td>Writing care plans</td>
<td>77</td>
<td>83</td>
<td>85</td>
<td>88</td>
<td>162</td>
<td>171</td>
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<tr>
<td>(12.0%)</td>
<td>(13.0%)</td>
<td>(13.3%)</td>
<td>(13.8%)</td>
<td>(12.7%)</td>
<td>(13.4%)</td>
<td></td>
</tr>
<tr>
<td>Using resources</td>
<td>19</td>
<td>35</td>
<td>7</td>
<td>44</td>
<td>26</td>
<td>79</td>
</tr>
<tr>
<td>(3.0%)</td>
<td>(5.5%)</td>
<td>(1.1%)</td>
<td>(6.9%)</td>
<td>(2.0%)</td>
<td>(6.2%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>370</td>
<td>438</td>
<td>443</td>
<td>455</td>
<td>813</td>
<td>893</td>
</tr>
<tr>
<td>(57.8%)</td>
<td>(68.4%)</td>
<td>(90.2%)</td>
<td>(71.1%)</td>
<td>(63.5%)</td>
<td>(63.8%)</td>
<td></td>
</tr>
<tr>
<td>*Using a computer</td>
<td>153</td>
<td>332</td>
<td>129</td>
<td>247</td>
<td>282</td>
<td>579</td>
</tr>
<tr>
<td>(23.9%)</td>
<td>(51.9%)</td>
<td>(20.2%)</td>
<td>(36.6%)</td>
<td>(22.0%)</td>
<td>(45.2%)</td>
<td></td>
</tr>
<tr>
<td>*Spending time with patients</td>
<td>146</td>
<td>84</td>
<td>119</td>
<td>79</td>
<td>265</td>
<td>163</td>
</tr>
<tr>
<td>(22.8%)</td>
<td>(13.1%)</td>
<td>(18.6%)</td>
<td>(12.3%)</td>
<td>(20.7%)</td>
<td>(12.7%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>341</td>
<td>224</td>
<td>392</td>
<td>314</td>
<td>733</td>
<td>538</td>
</tr>
<tr>
<td>(53.1%)</td>
<td>(35.0%)</td>
<td>(61.3%)</td>
<td>(49.1%)</td>
<td>(57.3%)</td>
<td>(42.0%)</td>
<td></td>
</tr>
</tbody>
</table>
| *These activities were measured independently of the other activities in the table

DISCUSSION AND CONCLUSION

Although this study was designed to identify the influence of EP on clinical activities and the time that pharmacists spend in contact with patients, perhaps the most notable finding happened during the baseline data collection phase in which it was identified that pharmacists only spend a fifth of their time in contact with patients. This fell even further following the introduction of EP which, unsurprisingly, corresponds with an increase in the proportion of time pharmacists spend using computers. This is largely due to the background work pharmacists are required to undertake in order to carry out medicines reconciliation, review blood science results, support antibiotic stewardship, prepare the patient for discharge and deal with queries of varying complexity.

A more positive finding is that that the introduction of EP has reduced the time pharmacists spend looking for prescriptions and clinically checking them. That patients' understanding of medicines is suboptimal is well described, and as a result compliance is similarly poor. Pharmacists have a key role in addressing this, and we therefore need to ensure that we increase the proportion of time pharmacists are available to spend with patients discussing and counselling them about their medicines. Once a strategy to address this has been agreed and implemented, this work needs to be repeated to ensure this strategy has been effective.

REFERENCES


POSTER PRESENTATIONS

Vancomycin prescription in Queen Alexandra Hospital, Portsmouth

Sheikh A, Sivakumar P, Saigal A, Burrows K, Martin Z, Barwell L
Queen Alexandra Hospital, Portsmouth

The guidelines published in 2006 by the British Society for Antimicrobial Chemotherapy (BSAC) recommend the use of glycopeptides such as vancomycin as first-line therapy for treatment and prophylaxis of serious methicillin-resistant Staphylococcus aureus infections.1

Vancomycin requires careful prescription and monitoring to minimise side effects yet achieve satisfactory drug levels, in order to prevent prolonged length of stay and morbidity. Local guidance clearly states that patients should be loaded with vancomycin and commenced on a dose appropriate to weight. Drug levels should be checked at the correct time intervals (within four hours of the next dose) so that future doses may be adjusted to achieve satisfactory drug levels. This policy is not dissimilar to that of many trusts throughout the UK.

An initial audit carried out from April to June 2010 demonstrated poor compliance with current trust guidelines. A large proportion of levels were taken at incorrect times and only a small proportion of therapeutic levels were achieved.

A new trust guideline was implemented in 2011 to address these issues. Main changes included altered prescribing structure by calculating doses based on creatinine clearance rather than weight as well as emphasis on vancomycin loading with clearer guidance on level sampling. This was reaudited in 2012 to allow time for clinicians and pharmacists to adapt to the changes.

OBJECTIVES

- To identify whether guidelines were adhered to within the trust
- To establish the accuracy of dosing regimes, levels taken and whether therapeutic levels were achieved
- To ascertain the need for specific recommendations regarding antibiotic prescription and usage and introduce these into clinical practice
- To perform a re-audit to review the impact of changes to clinical practice

METHOD

Adult patients on vancomycin were identified through a filter programmed into the blood results database, highlighting when a level had been requested. Data was collected during a six-week period from March to April 2012 using patient notes and drug prescription charts. Paediatric patients were excluded as this patient group was not covered in the trust guidelines. Data analysis was performed using Microsoft Excel and comparison made with the initial audit in 2010.

Ethics approval was not required as the study was defined as an audit project.

RESULTS

Table 1 compares the data from 2010 (old guideline) and 2012 (following implementation of new revised 2011 guideline).

<table>
<thead>
<tr>
<th>Table 1: Comparison of data between 2010 and 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Number of patients</td>
</tr>
<tr>
<td>Number of vancomycin levels</td>
</tr>
<tr>
<td>Percentage of patients loaded with vancomycin</td>
</tr>
<tr>
<td>Percentage of patients commenced on dose</td>
</tr>
<tr>
<td>Percentage of samples measured at the correct time interval</td>
</tr>
</tbody>
</table>
In 2010, of 42 levels sampled at the correct time interval, only eight had a therapeutic vancomycin level (19%). Following the new guideline, only one out of six had a therapeutic drug level (16%).

CONCLUSION
Following the introduction of our new vancomycin guidelines, there has been a statistically significant improvement in the use of a loading dose (p<0.05). This reflects the emphasis the new guideline has on the importance of loading doses. Although the proportion of patients commenced on the correct dose appears to have improved, this is not statistically significant.

Despite the increased use of a loading dose, there was no significant change in the proportion of patients achieving a therapeutic level. The sample set is too small to draw an accurate conclusion with regard to this. Of concern, there appears to be a reduction in the proportion of levels sampled at the appropriate time interval in the 2012 study (p<0.05).

The data suggests that the new guideline has proved useful in the initiation of vancomycin, representing a positive step towards promoting patient safety in vancomycin therapy. However, once prescribed there continues to be a lack of awareness among healthcare staff regarding the correct timing of level sampling.

A limitation lies in the identification of patients on vancomycin therapy. It is feasible that some patients on vancomycin were missed if their medical team had failed to request a vancomycin level. We expect the frequency of this to be low and the method used to be practical when auditing a large trust. The 2012 data were collected over a shorter time period with a smaller sample size, which may explain the failure to demonstrate significant improvements following the new guideline. Doctors rotate on a regular basis and the uptake of a new guideline may be variable among different groups of prescribers. Comparing data from two separate years may be confounded by this factor.

We believe that despite changes to make a guideline more easy to use and follow, increasing staff awareness and improving access to a guideline is vital to its successful implementation. Therefore our key recommendation is for a push to improve the education of doctors, pharmacists and nurses regarding vancomycin prescription during trust induction.

REFERENCES

Table 1: Average savings per patient and item, by ward and division*

<table>
<thead>
<tr>
<th>Division and ward</th>
<th>Number of prescriptions</th>
<th>Number of items</th>
<th>Average savings per patient</th>
<th>Average savings per item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Division of surgery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal surgery</td>
<td>17</td>
<td>73</td>
<td>£26.67</td>
<td>£6.21</td>
</tr>
<tr>
<td>Short stay surgery</td>
<td>28</td>
<td>121</td>
<td>£54.20</td>
<td>£12.54</td>
</tr>
<tr>
<td>Surgical assessment unit</td>
<td>5</td>
<td>29</td>
<td>£15.34</td>
<td>£2.65</td>
</tr>
<tr>
<td>Thoracic surgery</td>
<td>24</td>
<td>100</td>
<td>£24.19</td>
<td>£5.81</td>
</tr>
<tr>
<td>Upper GI surgery</td>
<td>16</td>
<td>78</td>
<td>£29.54</td>
<td>£6.06</td>
</tr>
<tr>
<td>Urology</td>
<td>11</td>
<td>40</td>
<td>£18.98</td>
<td>£5.22</td>
</tr>
<tr>
<td><strong>Average savings for division</strong></td>
<td></td>
<td></td>
<td>£128.15</td>
<td>£28.62</td>
</tr>
</tbody>
</table>

| **Division of medicine** |               |                 |                             |                          |
| Endocrinology | 7               | 38              | £40.38                      | £7.44                    |
| Medical short stay | 6               | 38              | £60.39                      | £9.54                    |
| Respiratory ward 10 | 18             | 94              | £52.21                      | £10.00                   |
| Respiratory ward 54 | 71             | 71              | £64.16                      | £56.37                   |
| Stroke | 7               | 32              | £36.20                      | £7.92                    |
| **Average savings for division** | | | £130.30 | £20.05 |

| **Division of cardiology** |               |                 |                             |                          |
| Cardiology ward 51 | 7               | 41              | £34.84                      | £5.95                    |
| Cardiology ward 52 | 6               | 20              | £60.92                      | £20.68                   |
| Cardiology ward 53 | 12             | 47              | £117.65                     | £30.04                   |
| **Average savings for division** | | | £73.80 | £28.89 |

*The table excludes wards where fewer than five patients were seen in the three-month period

20 February and 18 May 2012 all prescriptions completed by the discharge service were assessed for savings. Ethics approval was not required.

In addition to the standard clinical and safety review, the discharge pharmacists liaised with the patient, in order to establish medications that were essential to supply at discharge. The ICE discharge system has a “supply” notification for the nursing staff for each TTO prescription to help them locate the medication for discharge, eg, “From fridge” or “Medication on the ward.” The pharmacists who finally authorised the TTO for dispensing picked the appropriate description from a drop-down menu, using “At home” for medication where sufficient supplies at home were identified. Medication costs were calculated on March 2012 trust prices (including VAT). The cost of a multicomartment compliance aid was based on the cost of a seven-day supply of the medication and the on-cost charged by our external supplier.

RESULTS
Over 62 working days, £12,512 was saved from 188 TTOs and 887 items were classified as “At home”. Savings were made on all wards examined. The greatest savings were made in the division of medicine (mean saving per patient was £130.68). This was largely due to significant savings made on one respiratory ward (Table 1). The mean saving per patient across divisions was £65.61 and the mean cost of each item saved was £13.91.

The most significant savings included dornase alpha Nebules (£2960.70), tobramycin Nebules (£1143.58), albutamun prefilled pens (£845.14), colistin Nebules (£437.19), morphine sulphate 200mg granules (£347.42), tiotropium 18microgram Handihalers (£308.64) and Seretide 250microgram Evoxhals (£285.52).

DISCUSSION
The results demonstrate that substantial medication savings can be made by a simple assessment of the drugs a patient already has at home. However, it should be noted that the majority of high cost savings are funded through external mechanisms. In addition, the study makes the assumption that the discharge service is better than existing dispensary processes for cost saving. A future control study of dispensary savings is recommended to fully compare costs and prove significance.

The staff costs for the discharge service were £206.85 per day. Savings from medications at home represent £201.80 per day, which equates to 97.6% of the cost of manning the service. This demonstrates that the service can cover most of its cost through preventing drug waste alone.

The study also showed a considerable reduction in waste, as there were 887 instances where repeat dispensing was prevented. It is important to note...
A re-audit of the prescribing of treatment doses of low molecular weight heparins at Croydon University Hospital NHS Trust

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Low molecular weight heparins (LMWHs) are derived from standard commercial heparins by enzymatic depolymerisation to produce fragments one third the size of heparin. In comparison to heparins, they have a decreased effect on activated partial thromboplastin time (APTT) but still inhibit activated factor X, which is the primary mechanism of action to prevent clot formation.

LMWHs are preferred to heparins as they have a better pharmacokinetic profile, only requiring a once daily administration in most cases due to their longer duration of action. They can be administered either in or out of hospital and do not require laboratory monitoring. They also pose a lower risk of heparin-induced thrombocytopenia compared to unfractionated heparins.

LMWHs are indicated for the treatment and prophylaxis of venous thromboembolism (VTE) and treatment of acute coronary syndromes (ACS). For ACS treatment, Croydon University Hospital (CUH) guidelines use fondaparinux, which does not require a dose calculation as it is weight neutral. The choice for VTE is tinzaparin, which requires a weight-based calculation for treatment doses.

Renal function must also be considered when prescribing LMWHs to prevent accumulation and toxicity. In July 2010, a rapid response report, "Reducing treatment dose errors with LMWHs", was issued by the National Patient Safety Agency following a large number of safety alerts. The alert included a report of one fatality and several incidences of harm to patients due to incorrect LMWH prescribing practice. Most of the prescribing errors were due to the use of estimated weight and incorrect calculations. The NPSA issued guidance on minimising the risk of errors in NHS organisations. In response to the alert, the previous audit was conducted at Croydon University Hospital NHS Trust in January 2011 to evaluate the prescribing practice and recommendations made to improve prescribing practice.

### AIM AND OBJECTIVES

- To re-audit whether improvements have been made on prescribing treatment doses of LMWHs following the recommendations made in January 2011.
- To determine the proportion of treatment LMWH doses prescribed using patients actual weight.
- To determine the proportion of correct dose calculation.
- To determine whether the renal function is appropriate for prescriptions of LMWH.

### STANDARDS

1. 100% of all doses of LMWH prescribed must be based on the patients actual weight and must be calculated correctly.
2. 100% of patients prescribed LMWHs should have a renal function of 30 ml/min or above.

### METHOD

A data collection form was available from the previous audit. The form was piloted on 17 and 18 November 2011 on the cardiology wards to make sure that it was appropriate. Data were then collected prospectively on all medical wards (including the medical assessment unit) over a four-week period between 21 November and 16 December 2011, by pharmacists during working hours including weekends. Maternity and paediatric wards were excluded from the audit as they had their own independent prescribing guidelines for the use of LMWHs. The required data was obtained from clinical notes, drug charts, discharge letters, VitalPACs, MUST charts and Wardpath (biochemistry data).

### RESULTS

Over the four-week period, data were collected for a total of 78 patients. The patients either received tinzaparin (n=56) for VTE treatment or fondaparinux (n=22) for ACS treatment. 80% of tinzaparin doses prescribed were based on the patient’s actual weight, compared to 47% from the audit in January 2011. 89% of tinzaparin doses were correctly calculated, compared to 82% from the previous audit. All the patients prescribed tinzaparin and fondaparinux had a creatinine clearance (glomerular filtration rate) of over 30 ml/min. No patients were discharged on LMWHs.

### DISCUSSION

Data were collected for the re-audit for a similar length of time to that of January 2011 to achieve comparable data. Results showed that 80% of tinzaparin doses prescribed were based on the patient’s actual weight, an improvement from the 47% from the previous audit. This showed that the recommendations from the previous audit were somewhat effective. The results also showed that 89% of tinzaparin doses prescribed were correctly calculated, which showed an improvement on the 82% from the previous audit. The 11% of doses calculated incorrectly were all corrected after the pharmacist intervention before any doses were administered to the patients, enabling the 100% of the standard to be achieved and preventing harm to patients. Standard 2 was met as all the patients prescribed tinzaparin and fondaparinux had a creatinine clearance (GFR) of greater than 30 ml/min.

### CONCLUSION AND RECOMMENDATIONS

Standard 1 was not met at 100% prior to pharmacists’ interventions, indicating a further need for improvement. It is vital to ensure that the correct dose, using the actual weight is prescribed at all times. As a result recommendations from the re-audit include:

- Further education of the nurses on the importance of using patients’ weight by ensuring patients are weighed on admission to the ward.

| Table 1: Tinzaparin dose calculation accuracy and actual patients’ weight usage |
|-------------------|-------------------|-------------------|
|                   | Audit 2011        | Audit 2012        |
| Correct dose calculated | 83%              | 89%              |
| Actual weight used          | 47%              | 80%              |
Use of a warfarin chart to improve anticoagulation at Countess of Chester Hospital NHS Foundation Trust

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*School of Pharmacy, Liverpool John Moores University; †Pharmacy Department, Countess of Chester Hospital NHS Foundation Trust

A strategy to improve anticoagulant treatment with warfarin for inpatients at Countess of Chester Hospital (COCH) was implemented following the National Patient Safety Agency safety alert regarding oral anticoagulants and our participation in the Safer Patient Initiative (SPI). The main goal of this strategy was to develop a warfarin chart with baseline/background information about the patient and supporting dosing algorithms for initiation and maintenance of warfarin therapy. Although the recommendations for initiation had a reasonable evidence base for both rapid anticoagulation and slow-loading, the dosing algorithm for maintenance therapy was largely based on experience and current practice.

OBJECTIVES

The objectives were to identify if appropriate use of the anticoagulant chart enabled patients to attain interventional normalised ratios (INRs) more quickly, and spend more time in their target range.

METHOD

The study was a retrospective cohort study of patients taking warfarin and with a previous admission to COCH. The chart was assessed for compliance with the documentation of baseline/background checks (eg, documented baseline INR before prescribing, documentation of the usual warfarin dose) and adherence to loading regimes and maintenance algorithms. Analysis was carried out using Minitab to determine statistical significance of data. In terms of the completion of background information, a statistically significant difference was identified for the time spent (percentage recorded between certain categories by conducting two sample t-tests and determining Pearson’s correlation coefficient (PCC) values.

RESULTS

Data were obtained from records for 127 patients, of whom 69 (54.3%) were initiated on the rapid anticoagulation regimen, 12 (9.4%) were initiated on the slow-loading regimen, 39 (30.7%) were continuing maintenance therapy on warfarin with a target INR between 2 and 3, and seven (5.5%) with a target INR between 3 and 4. The average treatment time on warfarin with admission lasted 8.73 days (SD=–4.51) and the average time spent adhering to the required dosing regimen was 4.52 days (+/–3.19), 54.22% (+/–27.26) of the total days treatment.

CONCLUSION

Results indicate that adherence to dosing algorithms and completion of background information lead to a statistically significant improvement for certain, but not all, indicators for anticoagulation control indicating that the algorithms have a statistically, but not necessarily clinically, significant effect of improving anticoagulation. As adherence to and completion of the

REFERENCES

2 British National Formulary 62, September 2011, pp140-2

Table 1: Summary of initial vancomycin levels and levels after first dose increase

<table>
<thead>
<tr>
<th>Dose</th>
<th>Number of courses</th>
<th>Number of pre-dose plasma levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;10 mg/L 10-15 mg/L 15-20 mg/L</td>
</tr>
<tr>
<td>Initial dose 15mg/kg tds</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>After low vancomycin level and then frequency adjusted to 15mg/kg tds</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>After low vancomycin level and then mg/kg dose increased - remaining tds</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>After low vancomycin level both dose (mg/kg) and frequency increased to qds</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

In terms of adhering to the suggested algorithms, statistically significant results showing a positive correlation were:

- Time INR was in range as a percentage of total individual INR recordings (not necessarily a daily measurement) (PCC 0.28, p= 0.001)
- Time INR was in range as a percentage of the total treatment time (PCC 0.24, p= 0.006)

Statistically significant results showing a negative correlation for algorithm adherence were:

- Percentage time spent adhering and the time under-anticoagulated (PCC -0.24, p= 0.007)

Non statistically significant results showing a negative correlation were:

- Number of days until target INR was achieved (PCC -0.18, p= 0.091). 90 (70.9%) of the 127 patients reviewed reached their target INR taking an average time of 4 days (+/- 3.82) to achieve this.

Of the 90 cases to achieve target INR during admission, 48 (53.3%) followed the rapid anticoagulation regimen and took an average of 4.75 days (+/-3.96), seven (7.8%) followed the slow-loading regimen and took on average 6.71 days (+/-2.06), 32 (35.6%) followed the maintenance 2.5 and took an average of 2.46 days (+/-3.45), and three (3%) followed the maintenance 3.5 regimen and took on average 2 days (+/-1.73).

In the 37 cases where INR was not achieved during in-patient warfarin treatment 28 (75.7%) of these had adherence <70% and 21 (56.8%) had less than the average 54.2% adherence to the algorithms overall.

In terms of the completion of background information, a statistically significant difference was identified for the time spent (percentage recorded INRs) in therapeutic range (+18.04%, 95% CI 7.76, 28.32) and time under-anticoagulated (~0.868 days, 95% CI 0.059, 1.677), when compared to cases with no documentation of background information in a two tailed two sample t-test.

Of the 37 (29.1%) cases where target INR was not achieved during inpatient treatment with warfarin 17 (45.9%) had partial completion of the background information while the remaining 20 (54.1%) did not complete the section at all.

Statistically significant differences (p<0.05) as determined from 95% confidence interval, with adherence above the average 54.22%, compared to below average, were seen in the percentage of INRs in therapeutic range, the time taken to reach therapeutic range and the time spent under-anticoagulated. No significant difference was seen between adherence above 54.22% and adherence above 70% or between any categories when measuring effect on time spent over-anticoagulated.
chart was found to be low, strategies to increase proper use of the chart should lead to improved anticoagulation. Increasing awareness that there is now some evidence to support the effectiveness of the chart will be a key strategy.

REFERENCES

OBJECTIVES
1 To identify strengths and weaknesses within the current quality management system operated by KSS deanery pharmacy
2 To recommend and implement actions to improve the current processes

METHODS
Multisource feedback was collated from a range of stakeholders through the following forums:

- Chief pharmacist meetings: a summary of findings was presented to chief pharmacists including common problems and strengths in training identified through Centre Review. The group were asked for their feedback on the current process and how it could be improved.
- Preregistration tutor network meetings: as above
- Annual “review of the review” day: a meeting is held for all pharmacy education programme directors to consider a summary of Centre Review outcomes plus identified areas for concern.
- End-of-year trainee feedback: reviewed to identify whether there are any continued areas for concern that are not being addressed through Centre Review.
- Sampled pharmacy local faculty group minutes

Ethics approval was not required as this was considered a service improvement initiative.

RESULTS
Scope and structure of the quality manual In 2009 the focus of centre review was on preregistration pharmacist training. However, based on feedback from pharmacy stakeholders, this has now been extended to other SHA-commissioned pharmacy staff, ie, preregistration trainee pharmacy technicians and foundation pharmacists. There is now one quality manual that describes the education governance arrangements for all trainees.

In response to queries from trust local academic boards about standards against which quality is assessed, the GPhC initial standards for education and training now underpin the structure of the quality manual.

Timetable for verification visits It was a challenge to co-ordinate a verification visit on one day that would encompass medicine, dentistry, pharmacy and library support. Verification visits are now carried out unprofessionally within a given timeframe.

Verification teams In the first year the verification team typically comprised staff from the deanery education department with some input from the deanery pharmacy department. Incomplete understanding of the requirements of pharmacy training programmes by non-pharmacy verifiers occasionally led to points being missed during visits. Verification is now led by a member of the deanery pharmacy team supported by either a second deanery staff member or an experienced pharmacy educational supervisor from another trust. All verifiers undertake bespoke training.

OUTCOMES
On a number of occasions pharmacy has been seen as providing exemplary education and has been highlighted and publicised within the organisation. It has also highlighted where pharmacy can support the training of other staff groups.

Some of the challenges have been common to other professions and Centre Review provides an opportunity to discuss this with senior executives within the organisation. A recent example would be restrictions to internet access, which is required for both medical and pharmacy programmes. This
Waste medicines — reducing the NHS burden

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In November 2010, it was estimated that the value of medicines wastage in England annually is around £300m. This report of the scale and cost of medicines wastage highlighted the relationship between non-adherence and medication wastage. In addition to this, the White Paper “Equity and excellence: Liberating the NHS” hoped to build on the role of pharmacy in optimising medicines by providing new primary care services to patients and potentially reducing waste. Following research by Professor Nick Barber, in October 2011 there was the launch of the New Medicine Service (NMS) and targeted medicine use reviews (targeted MURs) as an advanced service, which is part of the community pharmacy contract and focuses on patients with long-term conditions. It was hoped to result in better adherence, less wasted medicines and fewer hospital readmissions which would directly save the NHS money.

AIM AND OBJECTIVES

To seek the views of community pharmacists about how they think the New Medicine Service and targeted MURs introduced in October 2011 will help reduce waste and ask their suggestions on other ways to tackle waste medicines and reduce the NHS burden.

METHOD

Following ethical approval, the opinions of community pharmacists in the local primary care trusts (PCTs) were obtained using a questionnaire in January 2012. The questionnaire method was chosen because it could provide the least disruption to pharmacists by guaranteeing anonymity. The questionnaire was piloted by community pharmacists and after various modifications a final copy consisted of 12 questions. Final consent to send the questionnaire was obtained by letter. Responses obtained from pharmacists were collated using Microsoft Excel 2007 and statistical analysis of SPSS. Pearson’s chi square analysis was carried out on relevant questions.

RESULTS

Table 1 shows the scores for the most important questions asked. Fifty-three responses (30 male, 23 female) were obtained. The results indicate that 92% of participants implemented the NMS. 58% of participants thought that the service would decrease waste. A low number of patients (43%) were enrolled locally into the NMS and this is highlighted by the fact that 94% of hospital pharmacists locally are not aware of the NMS and targeted MURs (Figure 1) service. 52% of community pharmacists believe that if the service shows a beneficial impact it would continue beyond 2013.

DISCUSSION

The results obtained from respondents suggest that as the NMS is being implemented by 92% of pharmacies locally, this could meet the aims and objectives of the NMS, resulting in better adherence, less fewer medicines and fewer hospital readmissions, which would directly save NHS money. However, only 58% of pharmacists who thought the NMS would decrease waste (Figure 1) but several pharmacists made a comment on the questionnaire that they believed it is too early to associate waste reduction with NMS. Importantly, having had experience in delivering the new service since its introduction in October 2011, community pharmacists were asked whether they had noticed an increase in patient referrals from hospital pharmacists into the NMS and targeted MURs service. A disappointing 94% of pharmacists said they had not and went on to make comments that more work needs to be done to engage hospital pharmacists in essential cross-sector communications to support the new service and that much more multidisciplinary integration is needed for the service to fully succeed.

The NMS is currently only funded until the end of 2013. If the service is unsuccessful because of the uptake of patients, as demonstrated by the figure of only 43% in the local area (Figure 1), or if there is an inability to demonstrate that pharmacy can make a beneficial impact, then future funding for the service is unlikely. Most pharmacists (52%) questioned believe the service will continue beyond 2013.

From comments made by the community pharmacists, an unexpected consequence of the NMS highlighted in the study is when the patient is prescribed a new medicine to reduce cost, the patient abruptly stops the other medicine and by doing so, leads to an increase in waste. Pharmacists need to acknowledge this and explain to the patient that other medication should ideally be completed. However, if the patient has prescribed a new medication because the patient is experiencing side effects, in this case the waste is inevitable.

Recently the Pharmaceutical Services Negotiating Committee announced a revised payment structure for the NMS. If it continues with the improved funding structure of these new services to demonstrate that they can deliver successful NMS and targeted MURs, then the list of medicines the NMS covers could expand to cover other therapeutic categories in the future.

CONCLUSION

The findings and discussion indicate that a lot of work needs to be done regarding the NMS and targeted medicines use review to increase the awareness of pharmacists especially in secondary care. Much more multidisciplinary integration between primary and secondary care is needed for the service to succeed. However, as community pharmacy improves patient compliance with medicines and continues to develop clinical services...
in the community, they will hopefully contribute to reducing the NHS burden and reducing medicines waste.

**REFERENCES**

2. Department of Health (2010); Equity and excellence: Liberating the NHS.
4. Pharmaceutical Services Negotiating Committee; (2011); New medicine service.

**EXPLORING PHARMACY SKILLMIX TO MAXIMISE PATIENT CARE; NEW WAYS OF THINKING?**

**Risky G**, Acomb C, Bradbury H

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“The development of pharmacy support staff is a key enabler in improving pharmaceutical healthcare”

To better understand optimum use of clinical pharmacy skills and wider staff development, trust chief pharmacists from the Yorkshire Strategic Health Authority (YTCPs) commissioned a review of their workforce, following an initial study, for which ethics approval had been received. In order to understand the potential impact on patient care outcomes, we first needed to explore specific role activities across trusts. Although NHS workforce data is available and updated annually, this only provides numbers and vacancy rates relating to pay grades, without a clear understanding of how staff are deployed, tasks and activities carried out by each grade and the level of responsibility within these tasks. New professional status for pharmacy technicians has impacted both on pharmacists (technicians taking on extended roles, releasing time for clinical activity) and pharmacy assistants (undertaking routine tasks devolved from technicians). This has evolved to a greater or lesser extent across trusts.

**OBJECTIVES**

The primary objectives were to: establish a baseline to enable managers to track changes in skillmix over time, and identify gaps in current training, particularly where staff are undertaking extended role.

**METHOD**

An online survey was undertaken across the region in November 2011. Practice areas for inquiry were drawn from a regional training framework. For each task in dispensaries, stores and procurement and for ward-based medicines management we asked participants to identify, by grade, the tasks each band are allowed to undertake, whether this was a primary/secondary role or if rarely undertaken and if there were any restrictions for high risk/complex tasks. The survey instrument was validated through selected pilot sites. Results and further implications were discussed with YTCPs. Key reflections from these discussions were noted, particularly with respect to developing patient care.

**RESULTS**

All 18 secondary care trusts within Yorkshire and Humber SHA were included in the survey and 100% response was received. Some trusts did not engage in all activities listed, therefore percentages are given from the number of respondents to each question. Only 12% (2/17) Band 4 and 5 9% (10/18) respondents stated their Band 4s were not allow ed to undertake ACT. There was wide disparity noted between trusts with some foundation skills*4 for medicines management. Most trusts (15/16) have Band 4 staff routinely (primary role) reviewing patients’ own drugs, whereas in seven trusts Band 4s are not allowed to be involved in this activity. Only three trusts have Band 4s involved in taking medication histories, with 10 trusts not allowing this activity for Band 4 staff. Many were not involved in Controlled Drug audit/destruction, which should be explored further. Most trusts (60%) had further training for handling high risk/complex drugs.

**REFERENCES**


**DISCUSSION**

There was a noticeable difference across trusts in how staff are deployed across bands (see Table 1). Most trusts (18/18) reported core dispensing tasks as a primary Band 4 role. YTCPs are particularly keen to develop the Band 4 role and have identified key learning areas for registrants. Accuracy checking was identified an essential role, yet is not commonly undertaken within all trusts at Band 4. YTCPs agreed that more pharmacy technicians need to start their accuracy checking and medicines management training earlier.

Training available, both regional and national*4 frameworks, provides a structure to enable thorough preparation and training for pharmacy technicians to engage in wider medicines management activities. However, it is important that pharmacy technicians are given these opportunities in practice and to access the appropriate training to facilitate improved patient care. Most importantly, it has provided a focus for further debate about using all pharmacy staff in optimising medicines management. For example, a Canadian study*5 suggested, in using their technicians more fully, they were able to treble the number of patients the pharmacists could review and increase the number of comprehensive assessments by 50% prior to patient care rounds. This was effected by pharmacy technicians obtaining data, assisting with drug information, triage of patients, evaluating drug usage, providing discharge counselling, supporting therapeutic drug monitoring, transfer of care, projects, problem solving and other value-added activities. Further research into activities of UK pharmacists and technicians is needed to establish how these impact on key trust targets, alongside an understanding of where pharmacy technicians’ skills are best deployed to maximise patient care.

**REFERENCES**


**REDUCING THE RISK OF PARACETAMOL OVERDOSE USING ELECTRONIC PRESCRIBING**

**Cavell G, Anderson C, Boyce M**

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Paracetamol is available for oral administration to adults as tablets containing 500mg, for intravenous administration as infusions containing 500mg in 50ml
or 1g in 100mL, and for rectal administration as suppositories containing 500mg and 1g. 1 Within our electronic prescribing system (EPMA, iSOFT Clinical Manager v1.4) prescribers of paracetamol can specify a single route of administration or can select a “multiroute” option, PO/IV/PR, allowing the nursing staff to administer paracetamol by the most appropriate route for the patient at the time the dose is needed and recording the route of administration for each dose given. Prescribers can select a frequency that is predefined within the prescription template or edit the dose and frequency if they wish to change it.

A previous audit of paracetamol use within our trust identified 27/48 patients prescribed intravenous doses greater than 15mg/kg/dose. Concerns that patients with low body weight or who are malnourished might be at risk of toxicity from inappropriately high daily doses of IV paracetamol led to changes being made to electronic prescription templates for intravenous and “multiroute” paracetamol. In January 2012 the templates for intravenous and “multiroute” paracetamol were changed. The frequency was prefilled with “every 8 hours when required” or “three times a day” to reduce the potential for maximum total daily doses of IV paracetamol exceeding 3g (50mg/kg for a 60kg patient). If prescribers choose to prescribe more frequent dosing regimens these have to be actively changed within the electronic prescription at the time of prescribing.

This paper describes an audit to measure the impact of this electronic prescribing patient safety initiative on prescribing of intravenous paracetamol. The audit was conducted in March 2012 and was registered with the trust’s clinical audit support system.

OBJECTIVES

- To measure compliance with the trust standard for prescribing IV paracetamol at a frequency of three times a day
- To determine the impact of an electronic prescribing template on promoting compliance with trust recommendations

METHOD

Electronic prescriptions from 27 wards were screened for intravenous paracetamol until a maximum of five prescriptions from each ward had been identified. For each prescription ward, patient ID, age, weight, dose, route, frequency, prescription template used and routes of paracetamol administration within the first 48 hours of the prescription were recorded. Data were analysed using Microsoft Excel.

RESULTS

Data were collected for 117 patients on 27 wards. The patient’s weight was documented within the electronic patient record (EPR) for 27 patients (27/117, 23%). Three patients had documented weights of less than 50kg. Doses were adjusted for two of these patients. Multiroute paracetamol (IV/PO/PR) was prescribed for 116/117 (99%) of patients. One patient was prescribed the IV route only. The results are presented in Table 1

<table>
<thead>
<tr>
<th>Template used</th>
<th>Number of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No template used</td>
<td>25/117 (21% )</td>
</tr>
<tr>
<td>“three times a day” prescribed</td>
<td>9/25 (36% )</td>
</tr>
<tr>
<td>“four times a day” or “every four to six hours” prescribed</td>
<td>16/25 (64% )</td>
</tr>
</tbody>
</table>

DISCUSSION AND CONCLUSION

The implementation of a template to limit the frequency of doses of intravenous paracetamol to a maximum of three times a day has significantly improved adherence to trust recommendations compared to prescribing without a template.

Where the frequency template was used 63/92 patients (68%) were prescribed a maximum of 3g/day IV paracetamol as recommended within the trust. Where no template was used 9/25 (36%) patients were prescribed the trust suggested maximum daily dose of 3g IV paracetamol.

In 23 cases the maximum frequency of three times a day intended for IV prescribing was changed for patients who only required oral paracetamol. One 81-year-old patient who weighed 46.8kg, and who should have been prescribed a maximum daily dose of 2.8g of paracetamol, was prescribed 1g multiroute paracetamol four times a day from an altered template. The oral paracetamol prescription should be selected for patients only requiring oral therapy instead of changing the default frequency in the “multiroute” prescription.

The introduction of a frequency template into the electronic prescribing system at King’s has successfully restricted the frequency of prescription of IV paracetamol to 3g daily in line with trust policy to reduce the risk of overdose in susceptible patients. Further improvements may be made by encouraging prescribers to specify a single route of administration when prescribing paracetamol and by removing the option to prescribe without a predefined template. The results of this audit will be circulated to clinical teams through the divisional clinical governance meetings.

REFERENCES


Introducing prescribing standards to improve medicines safety to a hospital in rural Uganda: A re-audit

Oates K, Toop H, Crawley JE, Green CF
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 Kisizi 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 further 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 Kisizi drug and therapeutics committee (D&TC), the COCH team set about strengthening the concept of medicines safety, which led to a general review of prescribing and prescription writing. Local prescribing standards were developed along with the Kisizi D&T at a visit in April 2010 and following discussion with the Kisizi senior clinicians. The standards are based on WHO guidelines,4 Uganda National Clinical Guidelines5 and the COCH medicines policy,6 as well as incorporating some elements of existing local practice.

The standards were ratified by the Kisizi D&T 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 inpatients and
and it would be expected that a progression in the development of a safe prescribing culture will take some time to develop and embed.

**REFERENCES**


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### Table 1: Compliance with prescribing standards in 2010 and 2011

<table>
<thead>
<tr>
<th>Standard</th>
<th>Compliance 2010 (n=306)</th>
<th>Compliance 2011 (n=413)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug name printed</td>
<td>104 (34%)</td>
<td>21 (5%)</td>
</tr>
<tr>
<td>Generic name used (no abbreviations/brand names)</td>
<td>225 (74%)</td>
<td>339 (82%)</td>
</tr>
<tr>
<td>Dose documented</td>
<td>271 (89%)</td>
<td>401 (97%)</td>
</tr>
<tr>
<td>Frequency documented</td>
<td>253 (86%)</td>
<td>413 (100%)</td>
</tr>
<tr>
<td>Route documented</td>
<td>225 (74%)</td>
<td>355 (83%)</td>
</tr>
<tr>
<td>Prescription signed</td>
<td>91 (30%)</td>
<td>256 (62%)</td>
</tr>
<tr>
<td>Prescription dated</td>
<td>283 (92%)</td>
<td>393 (95%)</td>
</tr>
<tr>
<td>Number of “prns” with maximum daily dose documented</td>
<td>19/23 (83%)</td>
<td>15/15 (100%)</td>
</tr>
<tr>
<td>Antibiotic prescriptions with course length/review date</td>
<td>1/74 (15%)</td>
<td>12/59 (20%)</td>
</tr>
<tr>
<td>Antimarial prescriptions with course length/review date</td>
<td>4/71 (43%)</td>
<td>1/13 (8%)</td>
</tr>
<tr>
<td>Discontinued drugs signed (denominator)</td>
<td>58 (25%)</td>
<td>30 (13%)</td>
</tr>
<tr>
<td>Amended (as opposed to discontinued and re-prescribed) prescription items on chart</td>
<td>10 (3%)</td>
<td>4 (1%)</td>
</tr>
</tbody>
</table>

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**The effects of reflective review audits on antibiotic prescribing trends in primary care**

Edmonds H^1, Harvey-Kelly K^1, Hussey T^1, Naik Y^1

^1^ NHS Leeds, ^1^ University of Leeds

As part of the NHS operating framework, primary care organisations have been given targets around reducing the number of *Clostridium difficile* infections (CDI).**1** Nearly all classes of antibiotics have been implicated in the aetiology of CDI but some classes such as cephalosporins and quinolones have been highlighted as being particularly problematic.**2**

In October 2008 NHS Leeds had the highest incidence of CDI in England.**3** Having reviewed the current antimicrobial prescribing trends within NHS Leeds compared to other primary care trusts (PCTs) within the strategic health authority (SHA), NHS Leeds had the third highest quinolone and cephalosporin prescribing within the SHA.**4** The primary care antibiotic guidance was not easily accessible or in a user friendly format. Sensitivity testing undertaken by the local microbiology department did not follow the primary care antimicrobial guidance.

**OBJECTIVE**

To demonstrate whether reflective review audits can be used as a tool to change GPs’ prescribing habits to reduce the prescribing of antibiotics together with the development of evidence based guidelines and changes in microbiology reporting on samples.

**METHOD**

The initial approach was to develop robust antimicrobial guidelines for primary care that were web-based to enable easy access, user friendly and linked to the local secondary care guidance. This was followed by a number of educational events to promote the new web-based guidance to all prescribers within primary care, including GPs, nurse prescribers, community matrons and community pharmacists. By working closely with the local microbiology department we were able to change the sensitivity reporting system to report in line with primary care antimicrobial guidelines, which was implemented in May 2010.

In April 2009, as part of a prescribing incentive scheme, the PCT asked all 112 GP practices to undertake a reflective review of their quinolone prescribing, by reviewing up to 30 patients who had been prescribed a quinolone during a three-month period and repeating the audit six months later. GPs were expected to retrospectively review their prescribing and calculate the percentage of prescriptions where prescribing was in line with the primary care antimicrobial guidelines. The GP practices were also asked to develop and implement an action plan to improve compliance with the guidelines.

In April 2010 and 2011, this reflective review audit format was repeated as part of the quality outcome framework of the General Medical Council’s contract. One of the agreed audits for the Med 6 indicator was for GP practices to review cephalosporin prescribing. The total number of prescriptions issued for both antibiotic groups for the PCT was also monitored during the audit periods. As this was an audit, ethical approval was not required.

**RESULTS**

The results are set out in Figure 1. The number of prescriptions for quinolones showed a 33% decrease during the audit period. Cephalosporin prescribing rates showed a 66% decrease during the two-year audit period.
An evaluation of the prescribing of medication for patients with chronic obstructive pulmonary disease admitted to the Royal London Hospital

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Chronic obstructive pulmonary disease (COPD) is a progressive disease that affects an estimated three million people in the UK.1 The World Health Organization estimates that, by 2030, COPD will become the third leading cause of death.2,3 Furthermore, it is the second most common cause of emergency admissions to hospital, the fifth largest cause of readmissions in the UK and accounts for over one million hospital bed days in England.4 In the UK, direct care costs associated with COPD amount to £3bn per year, with the overall cost £6.6bn annually.5

Despite the presence of national guidelines for the management of COPD, many patients are misdiagnosed and given incorrect medicines in relation to their condition, symptoms and disease severity.6

This audit sets out to assess current treatment of some patients admitted with a primary diagnosis of a COPD exacerbation at a large London teaching trust.

OBJECTIVES

1. Assess the proportion of patients admitted with a correct diagnosis of COPD in accordance with spirometry results of FEV1/FVC ratio <0.7.
2. Assess how many COPD patients receive correct inhaler therapy in accordance to NICE guidelines, symptoms and with reference to spirometry results where available.
3. Assess how many patients presenting with a COPD exacerbation have access to rescue medication and self-management plan (SMP), unless contraindicated, in line with NICE guidance.
4. Assess total number of exacerbations patients have experienced in the past 12 months including those resulting in hospital admissions.

METHOD

A prospective, four-month audit across the acute admission and respiratory wards was undertaken between January and April 2012. All patients acutely admitted with a primary diagnosis of COPD and/or asthma exacerbation were included as part of the audit. A data collection form was designed and piloted over a one-week period before the start of the audit. Data collected included demographic details on admission and discharge, spirometry results and the number of exacerbations both in the community and those resulting in admission. To ensure accuracy of data, 10% of results obtained were verified and checked by an independent person. Wherever there was any ambiguity regarding diagnosis, an independent respiratory physician validated the diagnosis by reviewing the patient’s history and spirometry results.

RESULTS

The audit included 328 patients, of whom 139 (42.3%) were female. Sixty-five patients (19.8%) had an asthma diagnosis on admission. Forty-five patients (13.7%) had a diagnosis of COPD with no spirometry results available. A total of 44 (13.4%) COPD patients were misdiagnosed, and 28 (8.5%) patients were readmitted during the four-month audit period. Six patients (1.8%) had rescue packs and SMPS prior to admission. On discharge, this increased to 44 (13.4%) patients. Only 174 patients had a correct COPD diagnosis with spirometry results available. See Table 1.

DISCUSSION AND CONCLUSION

The results show that 13% of patients had an incorrect diagnosis with reference to spirometry results. Table 1 shows only 42.4% of patients with very severe COPD had had spirometry in the previous six months. The National Institute for Health and Clinical Excellence (NICE) suggests that patients with COPD should have a minimum of annual spirometry undertaken, increasing to six monthly for those with very severe COPD.1 Potentially spirometry may have been undertaken elsewhere such as at the patient’s GP surgery but there was no evidence of this. A total of 57 (74%) patients with mild and moderate COPD were receiving triple inhaler therapy. NICE suggests triple inhaler therapy should be considered in patients who experience frequent exacerbations, however, there was no evidence of this. Although this may have also been due to symptomatic breathlessness, this was not fully explored as part of this audit, but represents an opportunity to optimise adherence to national guidance. Ensuring correct inhaler prescribing in accordance to guidelines is both cost effective and evidence based. Unsurprisingly, as disease severity progresses, a trend towards increasing number of hospital admissions was seen despite improved adherence to treatment guidelines.

REFERENCES

Although NICE advises the use of rescue packs and SMPS, only 13.4% of patients received these on discharge. Language, comprehension and understanding may have been barriers to optimising this, given the diverse population that is served by the trust, highlighting a need to address this in order to adhere to guidance.1

In summary, in a tertiary referral centre for respiratory disease, a proportion of patients have an incorrect diagnosis and are potentially being overprescribed inhaler therapy in relation to their underlying COPD severity, exacerbations and symptoms.

REFERENCES
1 NICE guidance. CG101 Chronic Obstructive Pulmonary Disease. 18 January 2012

Table 1: Inhaler management (with reference to NICE), exacerbation rates and spirometry results for the different stages of COPD

<table>
<thead>
<tr>
<th></th>
<th>Mild COPD</th>
<th>Moderate COPD</th>
<th>Severe COPD</th>
<th>Very severe COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Spirometry in the previous 3 months</td>
<td>45 (4%)</td>
<td>48 (5%)</td>
<td>53 (13%)</td>
<td>72 (7%)</td>
</tr>
<tr>
<td>Spirometry in the previous 6 months</td>
<td>–</td>
<td>–</td>
<td>25 (9%)</td>
<td>14</td>
</tr>
<tr>
<td>Number of readmissions over 4-month audit period</td>
<td>2 (22.2%)</td>
<td>4 (15%)</td>
<td>10 (16.5%)</td>
<td>2 (6.5%)</td>
</tr>
</tbody>
</table>

* NICE guidelines suggest only those patients with severe/very severe COPD require spirometry every six months; † triple therapy with LABA/LAMA/ICS

Aims and objectives

To evaluate the role of a pharmacist in a joint MDT programme between primary and secondary care services. The primary objectives were to establish the number and types of pharmacy interventions and assess the impact on patient care and hospital re-admission rates.

Method

Daily meetings took place between January and March 2012 aimed, through shared discussion, to identify patients suitable for discussion and further MDT input. COPD patients who were identified or referred to the MDT were individually reviewed to establish the route cause of their frequent hospital readmissions and to identify interventions that would promote a better healthcare outcome for the patient. Patients who frequently attended the hospital (more than 10 admissions in the previous 12 months) were targeted initially. Contributions to patient care made by the hospital pharmacist were recorded daily in a diary and later collated in a database.

Ethics approval was not required for data collection in this audit as patient specific data was not collected.

Results

Table 1 provides an overview of the number of patients discussed at the COPD MDT over the three-month pilot period, the types of intervention made by the pharmacist and the impact on the outcome of the patients:

- In total, 87 patients referred to the MDT were discussed in the pilot COPD programme, from which 30 patients were identified as having significant pharmaceutical care issues.
- Additional pharmacist input was required outside the MDT meeting for 10 (11%) of the patients, which either entailed visiting the patient on their medical ward for a further discussion, or arranging a meeting with another healthcare professional outside the MDT (eg, microbiology consultants for a discussion around antibiotic prescribing plans).
- The types of interventions made by the pharmacist were varied, with most interventions around pharmacist-led medication review to ensure optimal COPD management and checking inhaler technique and medication compliance.

Evaluation of pharmacist participation in a COPD-MDT: A programme to improve healthcare outcomes for patients with COPD

Mistry H, Savage S
Pharmacy, Kettering General Hospital NHS Foundation Trust

Chronic obstructive pulmonary disease (COPD) is the second most common cause of emergency admission to hospital and the fifth largest cause of readmission to hospital. On average, around 15% of patients admitted to hospital with a COPD exacerbation die within three months and around 25% within a year. Following discharge a patient with COPD is 30% more likely to be readmitted into hospital within a three-month period.1 In December 2011, clinicians at Kettering General Hospital (KGH) introduced a pilot multidisciplinary team (MDT), including secondary care healthcare professionals, primary care healthcare professionals and social care workers, to prevent the burden of frequent hospital readmissions in patients with COPD at KGH.

The aim of the MDT programme was to ensure a joint approach to improve the quality and outcomes for people with COPD.2,3 The programme included a consultant physician for older people, a hospital pharmacist, social care workers, intermediate care service providers and a specialist nurse from the hospital respiratory team.
DISCUSSION

The intention of the MDT pilot was to support patients across both primary and secondary care with COPD as a long-term condition. The results of this pilot highlight that pharmacists can play an integral supportive role in the MDT to improve patient healthcare (see Table 1). The role of the hospital pharmacist in the MDT was concluded as “helpful, particularly in relation to the use of anticipatory meds, patient education around their medicines and an action plan. Their role focused on helping to support people taking control of their health”.

As most of the referrals were made from KGH, the MDT model overall was seen as predominately serving the acute population. Consequently on review of the pilot programme, a community model has been proposed with the aim to prevent any predicted unscheduled hospital admissions for COPD patients. Interest has been raised in involving community pharmacists in the new community programme.

To conclude, pharmacy involvement in a MDT can significantly contribute to addressing pharmaceutical issues ensuring patients with long-term conditions such as COPD may benefit through optimal medication review and reduced hospital re-admissions.

REFERENCES


Comparison between pharmacy- and nurse-led TTO screening: an audit of the discharge medication process

Purcell J, May G
Norfolk and Norwich University Hospital NHS Foundation Trust

The Norfolk and Norwich University Hospital NHS Foundation Trust (NNUH) discharges on average 230 patients each day; of these the pharmacy department clinically checks approximately 150 discharge letters (TTOs). The pharmacy department operates a one-stop dispensing process, where medicines are provided to inpatients with labelled instructions and in sufficient quantity to avoid them having to wait for their medicines to be dispensed when they are discharged. In practice last-minute changes are often made to patients’ drug regimens at discharge and so further supplies of some medicines are frequently required the day the patient leaves the hospital. In order to identify which medicines are required TTO letters are annotated with a tick (✓) or a star (*): a tick if the patient has sufficient supply, a star if pharmacy is to dispense or amend the medicine. The annotation process can be performed by either pharmacy or nursing staff. After dispensing, and as a final step in the discharge process, nursing staff are required to recheck all the medications against the TTO before the patient is discharged.

In practice discrepancies in the tick and star process and final nurse check have occurred. Some of these errors have been highlighted as incidents on our Datix incident recording system, but it is probable that other errors have occurred that have not been highlighted.

To date the medication discharge process has not been audited. It was therefore proposed to perform an audit on the tick and star procedure to identify any areas of risk at discharge. As the study was a clinical audit, ethics approval was not required.

STANDARDS

100% of discharged medicines should match the discharge TTO letter:

- 100% of discharged medicines should be of the correct drug at the correct strength and of the correct formulation

100% of discharged medications should be accurately labelled for the patient with directions for use

100% of discharged medications should be of sufficient quantity to complete an intended course or for a minimum two weeks’ supply of ongoing medication

0% of medicines should be included that are not prescribed on the TTO letter

METHOD

Since medicine for the elderly (MFE) is a high-risk patient group for medication errors it was decided to focus on this specialty:

- Six MFE wards were audited, incorporating short, medium and longer stay admissions
- Data was collected from 9 January to 30 March 2012, Monday to Friday
- A data collection form was compiled and initially piloted before a final version was used for the remainder of the audit period
- Patients for discharge were identified by the MFE pharmacy discharge team and by intercepting MFE TTOs in pharmacy
- Each set of medications was rescreened and compared against the standards
- Errors were graded for their risk of severity by the auditor and an independent pharmacist

RESULTS

Fifty-six TTOs, containing 459 prescribed medicines were audited:

- 30 TTOs (255 medicines) had been screened by a nurse and 26 TTOs (204 medicines) had been screened by either a pharmacist or a pharmacy technician
- Overall four TTOs had a drug error, 12 had a labelling error, three had insufficient quantity supplied and 11 had medicines present that were not prescribed on the TTO
- 19 TTOs contained at least one error as compared to the standards.

Figure 1 shows the difference between nursing and pharmacy staff on adherence to the standards. Each error was graded for its potential to cause harm to the patient using nationally accepted rating criteria. Six errors were considered likely to cause no harm, five to cause a low degree of harm, 16 were at risk of causing moderate harm and four errors could cause severe harm. 90% of errors at risk of causing moderate or severe harm were from nurse-screened TTOs.

DISCUSSION

These results suggest that a potential for serious errors is prevalent in the discharge process used at NNUH. Errors with prescribed medicines suggest that insufficient attention to detail is given to the screening process. This may also be the cause of the errors found in non-prescribed medications, although the frequent occurrence of these errors may be as a result of nursing staff not removing unwanted medicines until the final two-nurse check immediately before discharge.

Despite the NNUH operating a one-stop dispensing process, there are circumstances when it is not considered appropriate to provide fully labelled
Rolling divisional antibiotic audits: improving prescribing and reducing inappropriate use of antimicrobial agents

Dormand J, Williamson I, Hylands J
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Healthcare associated infections (HCAs) within the NHS are reducing but they still pose a huge challenge to organisations and as a result the government has produced guidelines to help NHS trusts reduce HCAs. "Clostridium difficile infection: how to deal with the problem" recommends that trusts should ensure the prudent use of antibiotics and develop programs to capture and feed back data to directorates and wards on antibiotic use and Clostridium difficile infection (CDI) rates for the hospital as a whole.¹

Wrightington, Wigan and Leigh has developed a divisional antimicrobial audit programme to monitor divisional compliance with the antibiotic policy with the aim of improving compliance and reducing inappropriate antimicrobial prescribing and cases of CDI.

OBJECTIVE
To measure whether implementing regular divisional rolling audits of antimicrobial prescribing with regular divisional feedback could improve compliance with trust antimicrobial policy to 95%.

METHOD
No ethics approval was required as this abstract describes an audit project currently used within the trust for improving the quality of patient care.

An audit schedule was devised so that each division would be audited every six months. The audit schedule began in January 2009, and every ward in each division was audited every six months.

An audit form was devised so that data collection was uniform across the divisions and was used for each audit. The data was collected by either the specialist antibiotic pharmacist or the senior technician. Data collected included patient details, antibiotics prescribed, indication for antibiotics, dose and frequency of antibiotics, allergy status and microbiology advice.

Data collected was analysed in conjunction with patient medical records and blood results and the prescribing of antibiotics deemed as appropriate or inappropriate with regards to the trust antibiotic policies.

Each audit was then formally written up and presented at each divisional audit meeting by the consultant microbiologist or specialist pharmacist. Results for each division were reported as overall compliance and then broken down into ward compliance to aid feedback to ward and medical staff.

Results of each audit were also reported to the trust’s infection prevention and control committee.

If the audits highlighted any major areas of concern these were brought to the attention of the divisional chair so that immediate action could be taken and not delayed until the findings were formally presented.

RESULTS
The results in Figure 1 show that there has been an overall improvement in compliance with antibiotic policies by all the divisions, although the biggest improvement was seen in the musculoskeletal division (MSK).

DISCUSSION
Introducing the divisional rolling audit programme within our trust has enabled us to monitor and improve antibiotic prescribing across all divisions. This has been as a result of these audits and in conjunction with improved training on antibiotic prescribing and an emphasis on all staff of the importance of getting antibiotic therapy correct. The trust has also introduced a new drug chart that enables the prescribing of the indication for antibiotics. This has aided ward pharmacists to monitor antibiotic compliance on a daily basis.

The divisional audit programme has meant that the consultants are informed of any problems within their division and this has improved ownership of the issues, which has helped improved compliance with Trust policy.

Reporting back at the mandatory audit meetings also meant that the information was presented to all the consultants in the division and action plans implemented that everyone was in agreement with. For example the poor compliance reported after the first MSK audit resulted in the consultants agreeing to a change in practice which took a few months to adopt but, as the consultants had engaged with the process, it meant that the changes were accepted and behavioural prescribing changed.

Further work is needed to look into whether there are still patients not receiving antibiotics that should be but this is outside the remit of this audit.

One of the limitations of this audit was that it was performed using the point prevalence technique and therefore the data is just a snapshot of prescribing practice on that day and may not be truly representative of practice but is currently the best option we have.

In the future with the development of e-prescribing programmes it is hoped that daily data will be available that will provide more accurate information regarding antibiotic prescribing.

REFERENCES
¹ Department of Health and Health Protection Agency. Clostridium difficile infection: how to deal with the problem®, December 2008
Major abdominal surgery can result in significant fluid loss and hypovolaemia, necessitating administration of large amounts of fluid to maintain organ perfusion. The ideal composition of intraoperative fluid and its influence on patient outcome is subject to considerable debate.

Intraoperative fluid volume overload has been associated with poorer outcome in abdominal surgery, leading to use of colloid infusions to reduce crystalloid volume required. Trials in critical care have shown no benefit of colloid over crystalloid fluids but no high quality research is available in patients undergoing abdominal surgery. Hydroxethyl starch (HES) infusion may show superior volume restoration, though concerns remain over its safety and reliability of published research. “Balanced” compared to saline-based fluid regimen may have a positive effect on inflammatory response and kidney function but available studies are small and do not reflect local practice. No local guidelines exist guiding choice of intra-operative fluids.

AIMS AND OBJECTIVES

- To investigate if and how intraoperative fluid administration is targeted to haemodynamic values.
- To determine if the type of intraoperative fluid administered has an effect on postoperative renal function and cardiovascular stability.

METHOD

Research ethics committee approval was obtained for this prospective observational study. Forty patients undergoing open abdominal surgery in a university hospital were recruited consecutively and analysed in groups of intraoperative fluid therapy: crystalloid fluids only versus crystalloid and colloid fluids (n=25 v. 15); receiving HES versus no-HES (n=3 v. 37) and less than 1L of saline-based fluid (LS) versus more (MS) (n=28 v. 12).

Cardiovascular stability was measured by need for vasopressor support intraoperatively and up to 12 hours postoperatively. Renal function was analysed from urine output (UO) during the first 12 hours postoperatively and plasma creatinine on postoperative day 1.

Data were collected from standard administration and observation charts by the researcher, who was not directly involved in patient care, and, owing to small subject numbers analysed, using the non-parametric Mann-Whitney test with significance level set at 0.05.

RESULTS

Fluid choice and targeting

Intraoperative and postoperative fluid volumes were comparable between groups. Preoperative renal function was similar. Individuals in the colloid, HES and MS groups had longer duration of surgeries and a higher rate of admission to intensive care. Twelve subjects were receiving succinylated gelatine infusion and three subjects HES. 53% of intraoperative colloid boluses were targeted against haemodynamic values, including all cases of stanch therapy, but only 42% of gelatin therapy. The maximum amount of saline received was 5,500mL, the median in the MS group was 1,250mL (mean 2,180mL). No subject in the LS group received more than 500mL saline.

Need for cardiovascular support

Intraoperative vasopressor (metaraminol or ephedrine) was administered in 58% of subjects, with no difference between those receiving colloid to those on crystalloid only. Seven cases required postoperative noradrenaline infusions; including all subjects receiving HES. Incidence of noradrenaline use was higher in the colloid than the crystalloid group (26% vs 12%), HES group than non-HES group (33% vs 16%) and MS than LS group (42% vs 7%).

Renal outcome

Mean urinary output was below 1mL/kg/h in the colloid group and the MS group; the difference between LS and MS was significant (0.79±0.4 vs 1.37±0.9 mL/kg/h, p=0.026 (Table 1). Considering the threshold for oliguria, in the LS group urinary output was below 0.5mL/kg/h in 11% of subjects compared to 33% in the MS group. Urinary output in the HES group was below 1mL/kg/h in all three subjects and in two did not reach 0.5mL/kg/h, while mean output in the non-HES group was satisfactory with 1.3mL/kg/h. Postoperative serum creatinine values were within range.

DISCUSSION AND CONCLUSIONS

The distribution of vasopressor use in this study contradicts presumed advantages of colloids as achieving better and more sustained intravascular filling than crystalloids.

In subjects receiving intraoperative colloid, HES or high saline loads, urinary output was not only lower but with mean values below 1mL/kg/h could indicate presence of acute kidney injury despite no differences in preoperative renal function. Potential reasons could be less appropriate restoration of volume or an adverse effect on kidney function by the fluid regimen itself. Individuals receiving colloids may have been sicker or undergone more complex surgery, causing a confounding effect. More rigorous research is required to investigate this.

Without haemodynamic fluid targeting, colloids may have been used preemptively on an assumption of benefit that is as yet unproven and subjects may have been over- or underfilled. Further local research should investigate how clinicians make choices about fluid types and why a certain colloid fluid is chosen, aiming to agree evidence based algorithms for safe and cost-effective intraoperative fluid use.

REFERENCES

optimum level of care it is essential that pharmacists can effectively communicate with prescribers. The more sparse the communication between professionals, the more adverse the outcomes to patient care.1

When pharmacy students visit hospitals in Northern Ireland on placement they have a number of opportunities to interact with real patients, eg, taking medication histories, counselling on their medications. Providing students with “real-life” situations to practise their communication skills with prescribers is more challenging. In Queen’s University of Belfast (QUB), student performance in objective structured clinical examinations (OSCEs) was more competent in patient scenarios than in doctor scenarios, regardless of subjects being assessed. Video has been shown to help students with their learning2 and multimedia-enhanced teaching significantly improves student performance under practical examination.3 In order to increase student confidence in challenging a prescriber’s decision, a student-led interactive workshop was organised in which a DVD demonstration of a number of pharmacist-doctor scenarios were shown and discussed.

AIMS AND OBJECTIVES
To examine the preparedness of Level 4 pharmacy students to challenge a prescribing decision and determine if ability to challenge prescribers could be improved by providing a student-led interactive workshop.

METHOD
Level 4 students were invited to attend a student-led “interactive negotiation skills workshop” in February 2012. Prior to attending the workshop, students were asked to complete a questionnaire examining their preparedness to challenge a prescribing decision. Ethical approval was sought and received from the School of Pharmacy, QUB. During the workshop, a Level 4 student led the group through an interactive PowerPoint presentation that required the group to reflect upon the importance of good communication. Students were also encouraged to relive situations where they had experienced conflict. A bespoke DVD created by the teacher-practitioner team, which highlighted examples of a number of interactions between pharmacists and doctors, was shown. Each scenario demonstrated the implications of poor communication on patient care, with a “poor” and a “better” method of addressing each situation included. The DVD included both face-to-face interaction in a hospital setting and telephone communication with a GP.

Students had an opportunity in the workshop to complete a formative OSCE of subjects being assessed. Video has been shown to help students with their learning2 and multimedia-enhanced teaching significantly improves student performance under practical examination.3 In order to increase student confidence in challenging a prescriber’s decision, a student-led interactive workshop was organised in which a DVD demonstration of a number of pharmacist-doctor scenarios were shown and discussed.

Students had an opportunity in the workshop to complete a formative OSCE with a “prescriber” in order to practise their skills. Following the workshop, the students completed another questionnaire to determine if their participation in the session had improved their perceived ability to challenge prescribing. The content of the DVD was made available to the students online following the workshop, providing them with an opportunity to view this prior to a summative OSCE at the end of the year. Students were asked by minute papers if they had viewed the DVD again and if they had found it useful in completing their OSCE.

RESULTS
Ninety-six percent of Level 4 students participated in the workshop, a total of 136 students. After the workshop, 78% of students felt more confident in their ability to challenge a prescriber’s decision. Those students who still felt unprepared to challenge a prescriber’s decision cited the reasons listed in Table 1. Regarding the methods used in the workshop to develop their negotiation skills, 52% of students attributed their new confidence to all components of the workshop, 30% to the DVD and interactive lecture and 18% to either the DVD or group discussion. Ninety-four percent of students agreed that the “DVD showed the form an interaction should take when challenging a healthcare professionals prescribing decision” and 39 students reviewed the DVD after the workshop prior to their OSCE.

Results from the end of year OSCE demonstrated an improvement in student performance with the average mark in the doctor-pharmacist interaction OSCE increasing from 55% in 2011 to 73% in 2012 (the OSCE pass mark being 48%).

DISCUSSION
The workshop increased student confidence in challenging a prescriber’s decision and knowledge of how to approach the prescriber. Students require more opportunities to practise this skill as lack of practice was cited equally before and after the workshop. As a teacher-practitioner team we are introducing this type of activity in hospital visits. Students were less confident in their clinical knowledge following the workshop even though the scenarios were specifically developed to be straightforward in order to maintain the focus on the teaching of the communication skills. Perhaps participation in the workshop exposed some students’ lack of knowledge or provided the realisation that their knowledge may not be sufficient to communicate effectively with a prescriber. The bespoke DVD proved to be an acceptable teaching tool for students and many took the opportunity to view this prior to their exam stating that it “showed different scenarios, what to do and what not to do”, “helped demonstrate the correct interaction with doctors” and “developed confidence for the OSCE”.

Comparison of similar OSCEs undertaken in 2012 with the results from the previous year showed an improvement in student performance.

CONCLUSION
The introduction of an interactive negotiating skills workshop increased student confidence in challenging the decision of prescribers and may have increased summative marking in doctor–pharmacist OSCEs. The use of a DVD to demonstrate communication skills was well received and provided professional role models. This type of innovative teaching may be advantageous; reducing time spent in didactic learning, allowing material to be viewed multiple times and demonstration of skills more challenging to teach in a university setting.

REFERENCES

Get it on time: improving inpatient access to medicines for Parkinson’s disease

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In 2010, a multidisciplinary group first audited inpatient access to medicines for Parkinson’s Disease (PD) following publication of the “Get it on time” report by the Parkinson’s Disease Society. Recommendations were made with the aim of reducing the number of missed doses. Interventions made include reviewing ward stock and EDC lists, educating ward and pharmacy staff, displaying posters and adding PD medication to the critical medicines list.

Recommendations from the audit included the implementation of a self-administration policy. Since then, electronic prescribing/ordering (e-record) has been rolled out across the trust. It was anticipated that inpatient access to PD medicines will have improved further as a result. An audit was planned to explore that hypothesis: ethical approval was not required.
OBJECTIVES

- To evaluate the impact of implementing electronic prescribing/ordering and a self-administration policy on the number of missed doses of PD medicines
- To establish the incidence and reason for delayed or missed doses of PD medicines
- To examine the data for time(s) during an admission or clinical areas

RECOMMENDATIONS

- Check e-record for solutions to better prescribing of PD medicines (generic or brand)
- Continue to display posters to raise awareness of getting PD medications on time
- Organise visits to acute areas, eg, assessment suite and the emergency departments to emphasise the importance of ensuring medications follow patients on transfer
- Document reason for admission on next audit to aid the analysis of frequent missed doses within four hours of admission
- Develop checklist to help nurses remember to transfer medication to other locations
- Review missed doses list for “non available medicines”, review stock lists on wards and emergency drug cupboard lists to ensure a comprehensive range of PD medicines are stocked at all times
- Liaise with the IT department to alert nurses by producing a pop up screen on e-record when a critical medication is missed
- Encourage PD patients to carry an up to date medication list with them
- Produce a guideline to help medical and pharmacy staff with formulation conversion and manipulation when patients are unable to swallow their normal PD medications because of acute illness
- Explore reasons why the uptake of the self-administration policy was unsatisfactory

RESULTS

Table 1 compares the mean number of missed doses during our audit (2011/2012) and the previous audits. Our re-audit revealed a marked reduction in missed doses. The small sample size precluded testing for statistical significance.

DISCUSSION

The introduction of e-record has led to a marked reduction on doses missed. The first four hours of admission is a period of stabilisation when patients are usually on an acute admission unit. This may explain the resistance to reduction in missed doses. Patients may not have brought in their own medication due to the nature of admission, the primary objectives for the medicines may be to stabilise patient, patient may be too ill, nil by mouth or medications may not be prescribed. Staffs on acute wards are approached to give their views on the reasons for missed doses for PD medication; the reasons suggested above for resistance to reduction in missed doses during acute admission were confirmed.

Co-beneldopa and co-careldopa, compared to other PD drugs, were the most commonly prescribed and missed PD drugs in our sample. This may be because of the wide range of preparations available of these medicines. One might expect rarer medicines to be missed more often than common agents such as co-careldopa. This suggests no individual medicine was more likely to be omitted than any other despite their frequency of use. Patients with multiple PD medications were more likely to have doses missed. Co-beneldopa doses were missed less frequently than co-careldopa between 5 hours and 48 hours of admission. This could be attributed to the fact that it is available as a dispersible formulation and patients are most likely unable to swallow and have nasogastric tubes in place.

The PD team interventions after the initial audit and the introduction of e-record prescribing/ordering have increased the availability of PD medication. Nurses can order medications needed directly from pharmacy to improve access to critical medicines.

Prescribing is clearer and more legible due to e-record, nurses can interpret prescriptions on better than when handwritten. Full product details are present — eg, co-careldopa listed as Sinemet Plus — signposts to correct product where a wide range is available.

The audit had a number of limitations. First, it was tedious trying to decide what admission encounter to evaluate missed doses for an individual patient as some patient had multiple admissions during the audit period. Secondly, getting information about the medicines a patient was on at admission was difficult due to poor handwriting in medical notes. A self-medication policy was also introduced after recommendation from the first audit but uptake was low.

REFERENCES


Chief pharmacists’ perceptions of using clinical indication on in-patient prescription charts

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The use of a national prescription chart across England has recently been advocated, as it is thought to provide practical and safety advantages. One standard is the ability to record clinical indications (CIs) for both regular and “when required” medications. Recording CI on the prescription, as well as the medical notes, has become topical with the introduction of antimicrobial stewardships and the need to audit antibiotic usage. However, CIs for other prescribed medication are often unclear or difficult to locate in patients’ medical notes, if recorded at all. This renders monitoring of the prescribing appropriateness difficult. Also, poor documentation of prescribing rationale is thought to contribute to prescribing errors.

AIMS AND OBJECTIVES

- To explore chief pharmacists’ (CPs) perceptions of using clinical indication for medication on in-patient prescription charts
- To explore which medications, if any, have a “clinical Indication” recorded on the in-patient prescription chart and how often they are completed in acute trusts across England

METHOD

Of the 146 non-specialist acute trusts (ATs) in England, 65 (45%) semi-structured telephone interviews with CPs or their representatives were
conducted in early 2012. Ethics approval was obtained from a HEI research ethics committee before data collection. Interviews were recorded, transcribed and analysed using thematic coding analysis to identify key information regarding the use of a CI within the prescribing system along with quantitative analysis.

RESULTS

Of the 65 ATs that participated, 16 (25%) were small, 22 (34%) medium, 14 (21%) large and 13 (20%) teaching. The regional strategic health authority cluster response was 23 (35%) in the Midlands, 26 (40%) in the North, 12 (18%) in the South and four (6%) in London.

Three themes emerged after data analysis: clinical workflow, regulation and patient safety.

Clinical workflow The terms “helpful” and “useful” were used (n=23/65) on a number of occasions regarding the use of a CI on the prescription, indicating that its use would be beneficial in assisting communication between health care professionals (HCPs) around the prescribing process. — “Very pro, because not only does it help with . . . I think it helps prescribers, certainly helps pharmacists when checking the prescriptions and also it assists with the information that we are now supposed to be sharing with patients” (small AT in SW).

Patient safety The extent of medication that CPs thought should have a CI documented on the prescription ranged from all medications to a select few. Debate involved concerns about accuracy, compliance and patient safety such as junior doctors’ knowledge when prescribing and whether it was realistic to find the indication of a patient’s medication on admission. — “I think that for certain things it’s a good idea but I think for particularly some of the regular meds, I would be concerned that actually the junior doctors wouldn’t know and would therefore guess and then you have actually got inaccurate information, so erm . . . because they won’t know when they write that drug up on admission what the clinical indication for everything is” (medium AT in SE).

The vast majority of CPs (35/65, 85%) had seen the “standards for the design of hospital inpatient prescription charts”. The ability to record CI for all medications is on the prescription in 6% (4/65) of the ATs represented (one of each size), in line with the new standards; however, these were only sometimes completed. Table 1 illustrates the distribution of clinical indication requirements.

A total of 50 (77%) ATs required a CI to be recorded for at least one medicine on the inpatient prescription chart; seven stated that the CI was completed all the time, 23 most of the time, 17 sometimes, one rarely and one did not know.

DISCUSSION AND CONCLUSION

This qualitative study gives a snap shot of current practice and the perceptions from a chief pharmacists’ perspective which would encompass both their professional and managerial roles. They viewed the use of CI as “helpful or useful” in assisting the prescribing process and review of prescriptions, as it should be documented in the notes, but is rarely done. However, there were differing opinions about the extent and range of medicines a CI should be recorded for on the inpatient prescription. In practice the CI is not recorded on all medicines, with only a few ATs providing a space on the prescription. Reported completion rates of the CI showed that it was done most of the time. The introduction of a CI on all medication would have implications for current practices and procedures.

The value and effectiveness of a CI on all medication requires further investigation, especially from a health care professional’s view. It was acknowledged that there was little response from the South and London hospitals; however, every effort was made to account for this.

REFERENCES


An audit on stroke prevention in atrial fibrillation

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Atrial fibrillation (AF) is prevalent in 1.3% of the UK’s population and increases a patient’s risk of stroke by five to six times. Strokes cost the NHS a massive £2.8bn annually and can have a life-threatening and devastating impact for the patient. Consequently prescribing appropriate stroke prevention in AF is a national priority and one of the top six quality, innovation, productivity and prevention (QIPP) areas.

At Leeds Teaching Hospitals (LTH) the National Institute for Health and Clinical Excellence (NICE) AF guidelines are currently used to categorise patients with regards to their stroke risk and to prescribe the relevant prevention. The European Society of Cardiology (ESC) guidelines for AF categorise patients according to their CHADS2, CHA2DS2-VASC, and HAS-BLED scores. Patients who have a CHADS2 or CHA2DS2-VASC score of 2 or higher are categorised as high risk for stroke and patients who have a HAS-BLED score higher than 3 are at a high risk of bleeding. Our aim was to review the effect of scoring patients against all these criteria.

OBJECTIVES

To audit stroke prevention drug therapy in patients with AF admitted to LTH against the following standards:

- NICE AF guidelines
- CHADS2
- CHA2DS2-VASC
- HAS-BLED

METHOD

Data were collected for 37 consecutive patients with AF who were admitted to the cardiac admissions ward at Leeds General Infirmary (LGI) over a period of three weeks during September and October 2011. Ethical approval was not needed for this audit; however, care was taken to protect the confidentiality of the patients involved. Patients were excluded if they were newly diagnosed with AF or had atrial flutter. Information was recorded surrounding the patient’s details and admission. Further information was recorded about any stroke prevention they were receiving and possible cautions and contraindications for anticoagulants and antiplatelets. Each patient was then scored according to the CHADS2, CHA2DS2-VASC and HAS-BLED, which assesses bleeding risk. The data were then collated using Microsoft Excel and analysed accordingly. The findings were presented to the consultant cardiologists and their junior colleagues at an audit meeting.

<table>
<thead>
<tr>
<th>Medicines for which clinical indication is required</th>
<th>Number of acute trusts</th>
</tr>
</thead>
<tbody>
<tr>
<td>All medicines</td>
<td>4</td>
</tr>
<tr>
<td>Regular medicines</td>
<td>2</td>
</tr>
<tr>
<td>PPI medicines</td>
<td>16</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>29</td>
</tr>
<tr>
<td>Warfarin</td>
<td>20</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
</tr>
<tr>
<td>None</td>
<td>15</td>
</tr>
</tbody>
</table>
Atrial fibrillation: the management of structured bleeding risk assessment (e.g., HAS-BLED) to better inform the NHS Improvement. Commissioning for stroke prevention in primary care – the role of atrial fibrillation. November 2006. www.nice.org.uk. www.improvement.nhs.uk/qipp/MenulLevel1/PrimaryCare/tabid/119/

Table 1: Differences between the risk assessment tools and oral anticoagulant use

<table>
<thead>
<tr>
<th>Risk assessment</th>
<th>High risk of stroke</th>
<th>Number (%)</th>
<th>Number on OAC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NICE AF</td>
<td>28 (76%)</td>
<td>18 (64%)</td>
<td></td>
</tr>
<tr>
<td>CHADS2</td>
<td>26 (70%)</td>
<td>18 (60%)</td>
<td></td>
</tr>
<tr>
<td>CHA2DS2-VASC</td>
<td>35 (95%)</td>
<td>20 (57%)</td>
<td></td>
</tr>
</tbody>
</table>

RESULTS

There were 10 males and 27 females within the sample, with 21 (57%) of the patients aged 75 and over. Twenty-eight (76%) of the patients were classed as high risk of stroke. Only 18 (64%) of those were prescribed oral anticoagulants (OAC) as per NICE guidelines. Seven (19%) of the patients were classed as moderate risk and five (15%) of those were prescribed OAC or aspirin as per National Institute for Health and Clinical Excellence (NICE) guidelines. Two (5%) were classed as low risk and none of these were prescribed aspirin as per NICE guidelines. See Table 1.

Twenty-six (70%) of the patients were deemed to have a CHADS2 score of 2 and above, and 18 (70%) of these were prescribed OAC as per the ESC guidelines. All patients were re-scored using the CHA2DS2-VASC risk stratification system. Thirty-five patients (95%) had a CHA2DS2-VASC of 2 and above and 20 (57%) of these were prescribed OAC as per ESC guidelines. Two patients (5%) had a CHA2DS2-VASC score of 0-1, and neither of these was receiving stroke prevention within the guidelines. Of the 20 patients not prescribed OAC, one was had a true contraindication to OAC, one was on dual antiplatelets, and 14 were on single antiplatelet. No contraindications to OAC were documented except for one patient. The HAS-BLED scores for 14 of those not receiving OAC outside of the ESC guidelines were 3 and above.

CONCLUSION

There was poor adherence to stroke prevention guidelines in patients admitted to cardiology with existing AF. There was a differences in the stroke risk calculated using NICE, CHADS2 and CHA2DS2-VASC. As a consequence there may be a large number of patients not being prescribed appropriate stroke prevention. These scoring systems do not take into account contraindications and which may not be clearly recorded.

Generally, there was no documentation of reasons for not prescribing OAC where indicated. Reluctance to prescribe could have been due to concerns about bleeding risk. HAS-BLED used within the ESC guidelines assesses bleeding risk and states a score of 3 and above requires the OAC to be used with caution. However, this is not a contraindication and those patients can be prescribed OAC with extra monitoring and reduction of bleeding risk factors (e.g. stopping antiplatelet therapy where appropriate). For example the ESC guidelines recommend that in patients with stable vascular disease (e.g. >1 year, with no acute events) and in the absence of a subsequent cardiovascular event, OAC monotherapy may be considered.

We recommend using the more comprehensive risk stratification of CHA2DS2-VASC to score patients with regards to their stroke risk and to incorporate a method of documenting this into the admission booklet for Acute Coronary Syndromes (ACS) used at LTH T. During the cardiology audit meeting we agreed that our practice should change by clearly documenting the reasons why stroke prevention is not prescribed. There is also a need to use a structured bleeding risk assessment (e.g. HAS-BLED) to better inform the decision, when prescribing OAC in patients at high risk of stroke.

Limitations of this audit include the small sample number of patients, who were primarily female. Also, the audit was carried out of a short period on one ward only. Furthermore, the work was undertaken on an admission ward, where all medicines may not yet have been prescribed.

REFERENCES


OBJECTIVES

The aim of this audit was to evaluate the appropriate use of antipsychotics in dementia patients in a secondary care setting. This setting was in the form of a district general hospital.

The objectives of the audit were:
1. To identify all dementia patient receiving antipsychotics within pre-determined areas of secondary care settings
2. To evaluate whether their prescribing is appropriate
3. To evaluate whether the reason for administration is appropriate
4. To evaluate whether the antipsychotics prescribed are reviewed appropriately

Standards were developed using the 2006 NICE guidelines on dementia.

Standard 1: patients with dementia should only be prescribed antipsychotics if they are severely agitated or a danger to themselves or others. This should be documented.

Standard 2: Patients with dementia who have been prescribed an antipsychotic should only be administered an antipsychotic when they are severely agitated or a danger to themselves or others.

Standard 3: Antipsychotic therapy in dementia patients should be time limited and regularly reviewed (at least every three months).

METHODS

Fifty eligible patients were identified by cross-referencing information from the pharmacy system and the medical information department. These were all inpatients at the chosen hospital between 1 May 2010 and 30 April 2011 who had dementia and had been dispensed antipsychotics. The audit was a retrospective one, hence notes were obtained and the extracted information was audited against the aforementioned standards. Ethics approval was not required due to the fact that the study was in the form of an audit.

RESULTS

The majority of drugs were started prior to admission, but of the 15 drugs initiated in hospital, only seven were deemed appropriate prescribing.
Examples of indications that were deemed inappropriate include use in patients mumbling repetitively and use as a hypnotic. Also, 38 of the 50 patients had their antipsychotic prescribed regularly. Of the doses administered to the patients that were prescribed “when required” doses, only 10 of the 72 doses were administered for appropriate reasons. The majority of the administered doses classed as being inappropriate were due to absence of documented reasons in both the medical and nursing notes. Of the review process, six of the 15 patients’ drugs initiated in hospital were regularly reviewed, yet only one of the 35 patients admitted to hospital on an antipsychotic had the drug reviewed on admission.

**DISCUSSION**

The majority of antipsychotics are not being prescribed or administered appropriately in secondary care. Also reviews are not being undertaken regularly on the drugs. Patients who took antipsychotics prior to admission are not having their drugs reviewed. Potential reasons for the current practice were identified as being lack of awareness of the risks of using antipsychotics in dementia patients, lack of local guidelines and a lack of non-pharmacological methods of managing aggression and agitation in dementia patients on general medical wards.

An action plan was developed which included educating staff of the risks associated with antipsychotics, a need to introduce guidelines with standardised behavioural charts health board wide, and to develop and implement realistic non-pharmacological methods of therapy that can be used on busy acute hospital wards.

**REFERENCES**


**OBJECTIVES**

- To assess adherence to neurosurgical antibiotic guidelines
- To assess compliance with antibiotic stewardship (indication and stop/review date documented on prescription) of neurosurgery patients during inpatient stay
- To assess the impact of targeted feedback on prescribing quality

**METHOD**

Once weekly, at the same time each week and for four consecutive weeks, data was collected from electronic patient records (EPR). A pharmacist and doctor reviewed all neurosurgical patients who were prescribed antibiotics and went through each antimicrobial prescription recording whether they adhered to guidelines and if indication and stop/review dates were documented on the prescription. Prescriptions that did not conform were corrected and changed at the time of the data collection. Timely individual feedback to the prescribers who had not adhered was delivered by the doctor involved in data collection.

The study was classified as an audit and therefore ethics review was not required under the terms of governance arrangement for research and ethics committees in the UK. Confidentiality and anonymity of all patients was preserved in the study.

**RESULTS**

The results are summarised in Table 1.

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of patients</th>
<th>Number of antibiotics prescriptions</th>
<th>Number of indications documented</th>
<th>Number of crv or stop dates documented</th>
<th>Number of prescriptions adhering to guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1: 8 June 2011</td>
<td>14</td>
<td>16</td>
<td>13 (81%)</td>
<td>13 (81%)</td>
<td>15 (94%)</td>
</tr>
<tr>
<td>Week 2: 15 June 2011</td>
<td>15</td>
<td>22</td>
<td>20 (91%)</td>
<td>13 (65%)</td>
<td>10 (80%)</td>
</tr>
<tr>
<td>Week 3: 22 June 2011</td>
<td>14</td>
<td>17</td>
<td>14 (83%)</td>
<td>9 (53%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Week 4: 29 June 2011</td>
<td>13</td>
<td>17</td>
<td>16 (94%)</td>
<td>16 (94%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>72</td>
<td>63 (87.5%)</td>
<td>51 (71%)</td>
<td>68 (94%)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The level of adherence to the neurosurgical antibiotic guidelines was extremely high at 93% overall. This can be attributed to the significant contributions from neurosurgical consultants in collating the antibiotic guidelines, and subsequent support for prescribing in accordance with them. Additionally, neurosurgical patients receive a lot of direct microbiology input due to the complex nature of their infections. All cases of non-adherence to trust antibiotic guidelines came in the prescribing of post-operative prophylaxis. These accounted for approximately a quarter of incomplete prescriptions. They were prescribed in theatre by either an anaesthetist or neurosurgical registrar.

Antibiotic stewardship results showed high levels of compliance with 87.5% of clinical indications and 71% of stop or review dates documented. Attitudes towards antibiotic stewardship have shifted. Clinicians have acknowledged the benefits to patient care and the convenience of allowing them to see, at first glance, why a patient is on antibiotics and at what stage of the treatment they are. Current prescribing behaviours must be taken forward and maintained.

During Weeks 2 and 3 the stop/review date standards dropped significantly from 81% in Week 1 down to 59% and 53% in Weeks 2 and 3, respectively. Most of these antibiotic prescriptions were for post-operative prophylaxis and had not been seen by a pharmacist prior to the audit. These prescriptions were all initiated in theatre so going forward we will need to engage the anaesthetists in antibiotic stewardship prescribing.

During the audit there were six antibiotic prescriptions stopped. Four of these prescriptions were prolonged post-operative antibiotic courses. One
was a simple UTI course stopped at Day 5 and lastly a patient on post-
spinecetomy penicillin V prophylaxis also being treated for sepsis and
therefore did not need the duplicate treatment. After the weekly data
analysis, prescriptions that did not conform were corrected and individual
feedback was delivered to the prescribers of non-compliant prescriptions.
The feedback was received positively and by the end of the audit (Week 4)
high percentages of both stewardship (94%) and adherence to guidance
(94%) were being reached. Weekly audits are not sustainable but to ensure
momentum and focus on antimicrobial stewardship is not lost ongoing
monthly audit and feedback is planned. The audit will also be expanded to
include neurology patients and neurosurgical outliers within the data.

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1 Department of Health. Antimicrobial stewardship: “Start smart — then focus”; November

An audit of the quality and accuracy of documentation regarding medication changes provided to general practitioners upon discharge from hospital

Vernon L, Gilibrand S, Ahmed S
Pharmacy Department, Salford Royal Hospital, Salford Royal NHS
Foundation Trust

The discharge summary is the main method of communicating details of a patient’s hospital admission to their general practitioner. During admission, medications will often be stopped, changed or omitted; at the point of discharge the details of these changes should be conveyed to the GP to ensure seamless care and patient safety. Previous local audit findings have identified weaknesses in the quality and accuracy of medication information in the discharge summary. In response, the format of the electronic discharge summary at Salford Royal NHS Foundation Trust was changed to include specific headings for medication changes, reasons for changes and follow-up needs. Two main types of discharge document exist: a full discharge summary and a “short stay” version for those admitted for 24 hours or less.

AIMS AND OBJECTIVES

The aims were to examine whether the new headings within the discharge summary were being used to document complete and accurate information on changes to patients’ medications at the point of transition from secondary to primary care. As this was an audit project, ethical approval was not required.

Audit standards:
1 Identify how often a medication change is stated in the discharge summary (target 100%)
2 Identify how often reason or justification for a medication change is given in the discharge summary (target 100%)
3 Check that, where relevant, appropriate course length, start date, or stop
   date information for medications is given in the discharge summary (target 100%)
4 Identify how often necessary medication follow up requirements are
   documented in the discharge summary (target 100%)

METHODS

A list of 100 patients was generated by systematic sampling from the list of
those discharged over the last two weeks of March 2012. Each of these 100 discharge summaries was examined to ensure that they met the inclusion
criteria (patient discharged from a ward using a standard discharge summary,
from primary care, who had a medicines reconciliation recorded by a
pharmacist during admission). The final number included was 81.

Data collected included any medication changes made, if these were
specified in the summary, if a rationale was given for the changes made, if

appropriate stop dates were included and if monitoring information was
included. Additional information gathered included the type of discharge
summary used, the grade of doctor completing the prescription, and whether
a pharmacist had made amendments to the summary.

RESULTS

None of the audit standards were met.

Seventy-three patients had one or more changes made to their medication,
with 292 medication changes overall. The most common changes were addition
of medication.

- 67% of discharges had information entered in the medication section
- 34% of medication changes were detailed in the discharge summary
- 84% of the changes listed also gave a reason (28% overall)
- 85% of necessary course length information was included
- 59% of changes requiring follow up were specified in the summary

Overall, 27% of summaries contained complete and accurate medication
information. Additional information from the audit revealed that inaccurate
discharge summaries are not limited to one particular grade of prescriber,
and that pharmacist involvement is low — only three discharge summaries
were amended by pharmacists. The short stay summaries tended to be more
accurate, more than 50% were complete and correct, compared with less
than 10% of the summaries for longer stay patients.

DISCUSSION

Documentation of medication changes, follow-up requirements and overall
completeness of summaries was poor. The longer stay patients tended to have
less accurate summaries, indicating that this is a risk factor for inaccuracies in
the discharge summary.

Some potential reasons for these findings may include doctors completing
summaries having limited involvement in that patients’ care during their
admission and lack of familiarity with the changes to medication, lack of
documentation where a medication change is made, and time constraints
when completing summaries, particularly on high turnover, busy wards.
Whether these are actual causative factors may require further investigation.

Pharmacist involvement in ensuring complete and accurate discharge
information appeared to be low. Pharmacy staff should be encouraged to have
greater involvement in the discharge summary process and to enter additional
information in the summary under the pharmacy heading if needed. A list of
medication changes during patient admissions may also help those preparing
summaries at the point of discharge, perhaps in the form of a rolling
“medicines reconciliation” document. This may be an area for future research.

Conclusion: Staff completing discharge summaries need to be encouraged to include complete information on medication changes, reasoning and follow
up needs. When making changes to medications, prescribers should clearly
document reasons in the medical records so that this can be conveyed to the
GP. Pharmacists should also have a greater involvement in checking that the
discharge summary is complete and accurate. Further work on the current
medicines reconciliation documentation may help and should be investigated
in future.

Limitations: The study assumed that where a medicines reconciliation
document was completed that it was correct. The sample size was smaller
than intended and some clinical areas were under-represented. Only one
member of staff was involved in data collection and analysis.

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4 Straw C, Singh E, Pileted V, et al. An audit of the quality of the documentation of
   medication changes during admission and at the time of discharge for a sample of
   patients aged over 79 years admitted to acute care of the elderly wards in a secondary
Developing a real-time antimicrobial surveillance system for use in a hospital setting

Northern Health and Social Care Trust, Northern Ireland

Healthcare-associated infections (HCAs) are acknowledged to be one of the most serious threats to global healthcare and are the cause of significant morbidity and mortality. An estimated 25,000 Europeans die each year as a result of HCAl, and the costs associated with HCAI in the NHS are as high as £1bn per year. Consequently to an outbreak of Clostridium difficile infection (CDI) in the Northern Trust an independent review of trust policies and procedures was conducted. The main recommendations of this review included (1) A robust infection surveillance system should be put in place. . . , (2) . . . arrangements . . . to monitor . . . infection control and antibiotic stewardship policies at ward level with regular user-friendly reports . . . , (3) . . . reports on action taken to promote sound antibiotic stewardship . . . and on appropriate performance indicators. The project described in this abstract forms the first part of the trust’s response to these recommendations.

AIM AND OBJECTIVES

The intention is to develop a user-friendly, web-based, software application with live data-feeds from multiple existing healthcare databases to improve the trust’s management of HCAs. The essential requirement is that the system must be compatible with NHS computer systems UK-wide so that the benefits are reproducible and scalable. The project is being conducted in several phases. This abstract considers Phase 1, the objectives of which were to monitor: (1) hand hygiene practices; (2) adherence to empirical antimicrobial policy, and (3) trends in antimicrobial usage. This is a service development project and did not require ethics approval.

METHOD

A multidisciplinary project board was established with senior representatives from pharmacy, medicine and the trust’s IT department. A project brief developed the business system requirements, including a phased approach to development (Phases 1 to 6) and real-time data-feeds from the microbiology, pharmacy and patient administration databases. The system must have secure web-based access from any PC connected to the hospital local area network, wireless or hard-wired, with selective controls on the levels of access granted to users. The project team had representatives from pharmacy, medical microbiology, microbiology laboratories, infection control, medicines governance, trust internal IT and regional IT. A commercial company was engaged to develop the software. The design and installation of Phase 1 took place between September 2011 and March 2012.

RESULTS

An HCAI “dashboard” has been developed which displays summarised strategic management information in a window containing six tiles, each of which contains a different report. Each tile can be maximised and the data analysed further by drill-down. Ward-based pharmacy staff enter data into the dashboard. Hand-hygiene data can be analysed for every ward trust-wide and this data can be stratified further by professional group. Antimicrobial usage-density, in defined daily doses per 100 occupied bed-days, is monitored by (1) individual antibiotic, (2) the associated risk of causing CDI (high/medium/low) and (3) cumulative total, trust-wide at ward, directorate and hospital level. A number of antimicrobials are restricted to consultant-only use and their use is validated on a daily basis by the antimicrobial management team. Anonymised, monthly, consultant-specific, reports are sent to the medical director and consultant microbiologists for review to keep antimicrobial usage under continual scrutiny. All prescribers receive monthly feedback on their use, appropriate and inappropriate, of antimicrobials. Variances in antimicrobial usage-density are highlighted automatically in charts and prescribing choices can be challenged subsequent to more focused auditing (see Figure 1). This promotes the use of narrow-spectrum, low-risk, antimicrobials, improving quality, safety, economy and efficacy in line with the quality, innovation, productivity and prevention (QIPP) agenda.

DISCUSSION

Data-entry by ward-based staff means that duplication of effort is minimised, administration time and paperwork are reduced and better use is made of antimicrobial pharmacists’ time. Trust-wide analysis of monthly antimicrobial audits can now be completed in three hours compared to three days with the previous paper-based system. This web-based dashboard allows the antimicrobial management team to review, and vet if necessary, in real time antimicrobial use trust-wide. This quality assurance mechanism ensures the appropriate use of all antimicrobials and allows inappropriate prescribing to be flagged up quickly and challenged. Data can be analysed at the level of a unique patient or aggregated to trust level and every level in between. Most importantly, the software gives access to the full archived history of microbiology laboratory data which can be analysed both in real time and retrospectively to detect changing trends in microorganisms and sensitivities. This allows the trust’s empirical antimicrobial policy to be adapted to meet local antimicrobial sensitivity profiles. A limitation of this software is that in its current format it does not interface with an electronic prescribing system (EPS). (No EPSs are currently in use anywhere in the trust.) However, the software is designed to be EPS-ready and such an interface, when completed, will allow us to build significant additional functionality into this application.

CONCLUSION

This HCAI dashboard improves the management of HCAs trust-wide. Phase 1 of this surveillance system monitors hand hygiene, antimicrobial consumption and promotes improved antimicrobial stewardship. It provides an initial series of appropriate antimicrobial performance indicators, the initial focsi of which are CDI and MRSA, with others pending. Later phases will include all microorganisms recorded on the laboratory system. Phase 2 will focus on additional microbiology surveillance data, other antimicrobial performance indicators and early warnings in the form of automatic microorganism-specific “intelligent” alerts. These outcomes are concordant with the recommendations of the independent review,1 NICE2 and QIPP.

REFERENCES

Pharmacist amendment of prescriptions: do we get it right?

Samperre K A, Timoney D, Jackson R
Wirral University Teaching Hospital NHS Foundation Trust

Hospital pharmacists review and verify a substantial number of prescriptions on a daily basis as part of their professional responsibility to ensure medicines are prescribed safely and legally. The EQUIP study identified a 10% error rate in prescribing in 19 acute hospital trusts across the North-west Region and found “omission on admission” (29.8%) to be the most common type of error. A medicines reconciliation audit conducted at Wirral University Teaching Hospital (WUTH) in 2011 identified a prescribing error rate of 41% during the medicines reconciliation process. These errors can delay patients receiving appropriate treatment and contribute to increased length of stay.

A policy in place at WUTH allows pharmacists to amend prescriptions that have been incorrectly composed (eg, simvastatin prescribed mane instead of mene; Sere tide 250 Accuhaler prescribed when the patient usually uses Sere tide 250 Evohaler), provided the amendment does not involve clinical decision(s) that would result in pharmacists taking sole responsibility for the action (eg, changing an antibiotic to the most appropriate formulary choice). The policy also describes when pharmacists need to discuss changes with a prescriber and document their actions in the patients’ case notes. Following an update to the policy in 2011, this audit was conducted to assess pharmacists’ compliance with this policy.

OBJECTIVES
- Determine the percentage of pharmacist amendments made that were permitted within the remit of the policy
- Determine the percentage of pharmacist amendments made that required discussion with the prescriber (and in how many cases this was done)
- Determine the percentage of pharmacist amendments made that required documentation in the case notes (and in how many cases this was done)

METHOD
The electronic prescribing system (EPS) was used to identify all the amendments that had been made by pharmacists during a one-week period in January 2012. A range of exclusion criteria were applied:

- Discharge prescription amendments (due to time constraints)
- Amendments by pharmacist independent prescribers (IPs)
- Prescriptions for deceased patients
- Prescriptions for patients discharged or transferred to another site
- Prescriptions for patients on closed wards due to infection outbreaks
- Prescriptions for patients whose notes were unavailable

Pharmacists’ documentation on the EPS and in the patient’s medical notes was compared with the standards of documentation required. These were documented on a pre-piloted data collection form and the results analysed using Microsoft Excel.

RESULTS
A total of 109 amendments were identified as being eligible for inclusion, with 81% being permitted by the policy. Table 1 summarises these amendments and compliance with the policy:

None of the amendments requiring discussion with the prescriber and documentation in the case notes were compliant with the requirements of the policy. Clarification of patients’ medication histories (eg, omitted medicines, wrong brands for drugs such as diltiazem) accounted for 62% of the amendments made; 26% of these were made on admissions wards. However, there were seven examples of documentation of amendments made in the case notes that were exempt from documentation requirements and 14 amendments were documented on the EPS which is not required as per the current policy.

DISCUSSION
The majority of amendments made by pharmacists were permitted by the policy. Amendments to dosing schedules (eg, prescriptions for simvastatin given in the morning changed to nighttime) and formulations/devices were the most common changes made by pharmacists. Changes to doses prescribed were the most common changes made that were not permitted by the policy.

Although the majority of these amendments did not require documentation or discussion with the prescriber, lack of documentation in the case notes made it difficult to ascertain whether pharmacists discussed the changes with the prescriber when required. This may possibly be a result of time constraints at ward level or a lack of understanding of what needs documenting. The use of the EPS to document amendments may be used as a means of communicating amendments between pharmacists. This is supported by the 13% of changes that were documented on the EPS as opposed to the 7% documented in the medical notes.

Further investigation is required in order to establish how the policy is interpreted by pharmacists and to find out if this plays a role in the lack of compliance as illustrated from this audit.

REFERENCES
3. Wirral University Teaching Hospital NHS Foundation Trust. Policy 045j – Pharmacists’ amendment of prescribing regimens and compiling lists of take home medication policy and procedure. 5 April 2011.

Table 1: Summary of the amendments made by pharmacists and their compliance with the policy

<table>
<thead>
<tr>
<th>Type of amendment</th>
<th>Number</th>
<th>Number permitted by policy (%)</th>
<th>Number requiring discussion with prescriber and documentation in case notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose changes</td>
<td>9</td>
<td>0 (0%)</td>
<td>9</td>
</tr>
<tr>
<td>Amendments to IV therapies</td>
<td>3</td>
<td>0 (0%)</td>
<td>3</td>
</tr>
<tr>
<td>Change in dosing schedule</td>
<td>58</td>
<td>54 (93%)</td>
<td>4</td>
</tr>
<tr>
<td>Addition/amendment of a device</td>
<td>13</td>
<td>13 (100%)</td>
<td>0</td>
</tr>
<tr>
<td>Clarification of a free text order entry</td>
<td>6</td>
<td>6 (100%)</td>
<td>0</td>
</tr>
<tr>
<td>Amendment of formulation/dosage form</td>
<td>11</td>
<td>11 (100%)</td>
<td>0</td>
</tr>
<tr>
<td>Amendment in therapy to prevent patient harm</td>
<td>1</td>
<td>1 (100%)</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>8 (100%)</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>88 (81%)</td>
<td>21</td>
</tr>
</tbody>
</table>

The standard of prescribing on the medical investigations day unit

Lal R, Burgess C, Graves A
Heatherwood and Wexham Park NHS Foundation Trust, Slough

Winner of Hameln Best Poster Award (see pS6)

An evaluation of insulin prescribing safety in a teaching hospital

Haddon S†, Adams K†, Arthur E†, Davis K†, Edwards A†, Gibbs K†, Taylor A†, James KL†
†Department of Pharmacy and Pharmacology, University of Bath; †University Hospitals Bristol NHS Foundation Trust

Insulin is frequently involved in medication errors. Between August 2003 and August 2009, the National Patient Safety Agency (NPSA) received 3,881 wrong dose incidents involving insulin. The NPSA Rapid Response Alert “Safer administration of insulin” and the Patient Safety First Campaign “Insulin prescribing bundle” have been issued to promote the safe prescribing, dispensing and administration of insulin. This study aimed to
evaluate doctors’ and pharmacists’ knowledge and adherence to these guidelines.

OBJECTIVES
To determine whether:

- Doctors prescribe insulin appropriately on the drug chart (eg, specify insulin, brand of insulin, device, route, the word units written in full, date of prescribing and prescriber’s signature)?
- Pharmacists endorse insulin prescriptions appropriately with the required information (eg, brand, insulin, device, route, the word units written in full)?
- Incidence of missed doses of insulin (defined as administration more than 60 minutes later than prescribed)?
- Doctors and pharmacists know the difference between the different types of insulin (long, short and intermediate acting) as outlined in “Safer administration of insulin”?
- Doctors and pharmacists have received any training on the safer use of insulin?

METHOD
A prospective, descriptive, cross-sectional audit was undertaken over a four-week period between 7 November and 2 December 2011 on all adult, non-obstetric wards at a large teaching hospital. A piloted, standardised self-completed questionnaire was administered to doctors and pharmacists to determine their knowledge of the duration of action of various insulin preparations and training received. Data on doctors’ adherence to insulin prescribing standards and incidence of missed doses were determined from the drug charts and recorded on a standardised data collection form. For those drug charts that had been reviewed by pharmacists, data were also recorded on the adherence of pharmacists to insulin endorsing standards. Audit criteria are outlined in Table 1. A standard of 100% was set for the criteria. Ethics approval was not required as the study was an audit. Data were entered into SPSS and analysed using descriptive statistics and frequency tables.

RESULTS
A total of 42 doctors and 13 pharmacists completed the questionnaire, giving response rates of 49% (42/85) and 68% (13/19), respectively. The majority of doctors were foundation doctors (48%, n=20) and the majority of pharmacists were Band 6 (39%, n=5). Table 1 shows the audit findings. Doctors correctly identified the correct duration of action for a median of 53% of the insulin preparations, whereas pharmacists correctly identified a median of 67% of insulin preparations. The majority (85%, n=192) of insulin doses were administered within 60 minutes of the prescribed time.

DISCUSSION
Doctors and pharmacists generally failed to achieve the 100% standard set for the audit criteria. Consistent with previous research, doctors’ and pharmacists’ knowledge of the duration of action of insulin preparations was poor. The majority of surveyed staff had not completed the “Safer use of insulin” training package. Alternative approaches for educating staff on prescribing include interactive workshops and feedback on prescribing abilities. Doctors and pharmacists regularly failed to annotate insulin prescriptions with the word “insulin” and the device.

Strategies that could improve prescribing include designating a specific section of the drug chart for insulin prescriptions, issue of cue cards and displaying computer screensavers to remind staff of good prescribing practices. In-patient self-administration has been shown to improve the timeliness of insulin administration and reduce medication errors. An action plan has been developed to implement the proposed recommendations. Study limitations were the low questionnaire response rates and difficulty ascertaining whether prescriptions had been amended by a pharmacist.

REFERENCES

Administration of postoperative paracetamol to fractured neck of femur patients with dementia

Dobrzanski S*, Austick A†, Deacon T‡
*Pharmacy, †Trauma Nursing and ‡Pain Management, Bradford Teaching Hospitals NHS Trust, Bradford

Postoperative pain in patients with fractured neck of femur is sometimes poorly managed. Many patients with hip fractures have a diagnosis of dementia. The present study was prompted by the observation that some paracetamol doses prescribed for postoperative pain were not administered because patients with dementia simply spat out the tablets that the nurses tried to give. Nurses felt that these patients might be prepared to take medicines in liquid form and sometimes asked the surgeons to represcribe medicines as “syrops”.

This study audited the frequency with which patients with dementia refused to take paracetamol tablets – the one analgesic always prescribed postoperatively for all patients. This was compared with the audit standard – the paracetamol refusal rate in lucid patients with fractured neck of femur. A trial service improvement was then introduced for patients with dementia, leaving nurses entirely free to administer paracetamol as tablets, liquid suspension, soluble tablets or intravenously, as they saw fit, without having to face the delays in having to ask a doctor to represcribe paracetamol in a new drug form. The paracetamol refusal rate in patients with dementia was then measured once more.

OBJECTIVES
- To compare the refusal to take postoperative paracetamol tablets in patients with and without dementia.
- To compare the refusal rate to take paracetamol tablets seen above with that in a group of patients with dementia where the paracetamol could be given in liquid or intravenous form without nurses having to ask a doctor to specify the drug form.

METHOD
The audit (ethics approval not required for service development) was carried out on an orthopaedic trauma ward in a teaching hospitals NHS trust. Postoperative paracetamol (1g four times a day) administration in patients following surgery for fractured neck of femur was monitored, starting at the 10pm dose on the day of surgery and continuing for the next three days. Therefore, the administration of the first 13 postoperative paracetamol doses was audited for each patient in the following three groups:

Table 1: Audit findings

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Doctors</th>
<th>Pharmacists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of insulin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of duration of action of different types of insulin</td>
<td>0 (0/42)</td>
<td>8 (1/13)</td>
</tr>
<tr>
<td>Completed training package on safer use of insulin 1</td>
<td>62 (24/39)</td>
<td>46 (6/33)</td>
</tr>
<tr>
<td>Adherence to good prescribing practices related to insulin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recorded the word insulin on drug chart</td>
<td>44 (100/226)</td>
<td>66 (104/157)</td>
</tr>
<tr>
<td>Recorded the brand of insulin on drug chart</td>
<td>95 (215/226)</td>
<td>95 (149/157)</td>
</tr>
<tr>
<td>Recorded dosage written as units with the word “units” specified in full on the drug chart</td>
<td>93 (211/226)</td>
<td>98 (153/157)</td>
</tr>
<tr>
<td>Recorded the insulin device on the drug chart</td>
<td>12 (27/226)</td>
<td>54 (84/157)</td>
</tr>
<tr>
<td>Ensure date of prescribing on the drug chart</td>
<td>93.6 (225/226)</td>
<td>95.4 (156/157)</td>
</tr>
<tr>
<td>Ensure prescriber’s signature on drug chart</td>
<td>100 (226/226)</td>
<td>100 (157/157)</td>
</tr>
<tr>
<td>Recorded the correct route of administration</td>
<td>98.7 (223/226)</td>
<td>98.4 (156/157)</td>
</tr>
</tbody>
</table>
A waste walk through clinical pharmacy: how do the “seven wastes” of Lean techniques apply to the practice of clinical pharmacists

Crawford V*, Green CF†, Bresnan G*, Rowe PH†
*School of Pharmacy, Liverpool John Moores University; †Pharmacy Department, Countess of Chester Hospital NHS Foundation Trust

As part of the Quality, Innovation, Prevention and Productivity (QIPP) challenge, acute hospitals are coming under increasing pressure to reduce costs, be more efficient and increase quality of the care they provide for patients. To meet this challenge, many hospitals are using Lean methodology to improve the efficiency and reliability of their services. At the Countess of Chester Hospital NHS Foundation Trust hospital (COCH), a working partnership with Unipart has led to the introduction of a number of Lean techniques, including the concept of the seven wastes and the “waste walk” where the assessors follow a process, making observations of opportunities that arise to remove elements of the process that do not add value. The aim of this study was to establish how much time in a clinical pharmacist’s day is wasted due to inefficiencies relating to the “seven wastes”.

OBJECTIVES
The objectives were to quantify clinical pharmacy activity that can be categorised as waste and identify opportunities to reduce waste in this context.

METHOD
Pharmacists were observed using time sampling methodology and data collection took place over 20 days in total. The researcher followed one clinical pharmacist on their ward visit for one hour on two occasions. The researcher carried a preprogrammed pager (Random Reminder, DeVilbiss Electronics) that randomly “bleeped” 36 times an hour. At each bleep the researcher documented the activity of the pharmacist at that time. Where there were two or more activities going on at once, the predominant activity was recorded. At the end of each ward round each activity that could be described as waste was placed into the appropriate category. The study had ethics approval and all participants gave informed consent to be observed.

RESULTS
Twenty different pharmacists were observed for one hour on two separate occasions, giving a total of 40 hours of observations, each with 36 bleeps, giving a total of 1,440 observations. Of these, 342 (23.8%) were categorised as waste, which are categorised in Table 1. There were no incidents of waste associated with “unnecessary inventory”, “transport of products and material” and “overproduction”.

The categorisation of some activities of waste could be challenged, for example, correcting prescription errors was classified as “waste” as part of this project but it is clearly not, because it prevents the patient from being exposed to potential harm. However, using Lean, this is clearly a form of waste because had it been done correctly the first time, it would not have needed correction. Similarly, 26 (1.81%) bleeps were while walking to the ward. This was classed as waste since it was working time in which nothing efficient or productive was being done that might have added value to clinical pharmacy activity.

DISCUSSION AND CONCLUSION
In combination, correcting errors was by far the most prevalent form of waste, and the trust, indeed the NHS, needs to examine strategies to tackle further and improve the quality of prescribing on a “right first time” basis. This has been highlighted in the recent EQUIP study. Pharmacists also appear to be entering information in the electronic patient record and in the paper record, which appears to be duplication; this requires further investigation. Accessing computers per se was not identified as a particularly important waste; however, waiting for computers to log on and log off was in

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**Table 1: Paracetamol dose refusal from 351 postoperative administration events per group**

<table>
<thead>
<tr>
<th>Patient group</th>
<th>Paracetamol doses refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without dementia</td>
<td>38 doses (5.1%)</td>
</tr>
<tr>
<td>With dementia (offered tablets only)</td>
<td>91 doses (25.9%)</td>
</tr>
<tr>
<td>With dementia (nurse chooses dose form)</td>
<td>48 doses (13.6%)</td>
</tr>
</tbody>
</table>

---

**REFERENCE**

The trust carries out monthly routine antimicrobial audits. Prophylactic “once only” doses are not within the scope of this work. This is a gap in the SRFT network of audits.

**AIM**

To assess the adherence of current prophylaxis antimicrobial prescribing against local guidelines and to identify areas for further audit and improvement.

**OBJECTIVES**

1. Ascertain percentage adherence to SRFT antimicrobial guidelines for urological surgery.
2. Identify types of urological surgery where guidance is difficult to apply.
3. Check clarity of documentation in cases when guidelines are not followed.
4. Record which antibiotics are given to urological patients as prophylaxis.
5.Ascertain the percentage of meticillin-resistant *Staphylococcus aureus* positive patients receiving correct antibiotics.
6. Plan for further audit.

**AUDIT STANDARDS**

1. 100% adherence to the SRFT 2011 guidelines.
2. Reasons for non-adherence to guidelines should be clearly documented in the notes.
3. Prophylactic doses should be prescribed as a “once only” dose.
4. A single prophylactic dose should be given, unless there is a documented reason otherwise.
5. Administration time of antibiotic should be documented in the notes in 100% of cases.
6. 100% of MRSA-positive patients should receive a dose of teicoplanin.

**METHOD**

Relevant patients were identified using urology, surgical high dependency and short stay surgery ward lists and urology elective theatre lists. Isotf clinical manager was used to assess each prescription chart/set of notes; the data was recorded on a data collection form and transferred to Microsoft Excel for analysis. A pilot study was conducted on 18 April 2012. The data collection tool was amended accordingly. Data collection was carried out on weekdays between 30 April and 4 May 2012. All patients undergoing urological surgery were included. Data was reviewed against audit objectives and standards.

Ethical considerations were not required; no more data was collected than would be reviewed on a routine pharmacist ward visit.

**RESULTS**

61% of prescriptions (n=33) were adherent to policy, 27% were non-adherent and in 12% of cases it was not possible to determine adherence status. The majority of patients received co-amoxiclav and gentamicin as per local policy. Reasons for non-adherence to policy included patients receiving other courses of prophylactic antibiotics and patients prescribed non-indicated antibiotics, particularly for cystoscopy and nephrostomy change.

Surgery not mentioned in SRFT policy was the main reason for non-determination of adherence. Incorrect antibiotics were given on two occasions where the bowel was directly involved in surgery, despite this being mentioned specifically in SRFT policy.

9% of patients were admitted to hospital prior to a procedure to receive prophylactic antibiotic courses with the majority receiving Tazocin. Documentation of reason for non-adherence was found in only one case.

18% of patients received additional prophylactic antibiotic doses/courses post-surgery; ie, not prescribed a stat dose alone. Co-amoxiclav alone or in combination with metronidazole or gentamicin was the most common drug used for this purpose. 66% of these did not have a valid documented reason for use.

Prophylactic doses were prescribed as “once only” medications in 70% of cases, if an antimicrobial was prescribed the time it was given was documented 100% of the time.

Standard 6 could not be assessed because no MRSA-positive patients were found during the audit.

**DISCUSSION AND CONCLUSION**

The study revealed that one of the six audit standards was fully met. Percentage adherence to guidelines has improved from 25%5 to 61%
following implementation of recommendations. The 12% of cases where guidelines could not be applied included surgeries omitted from local policy, suggesting the need for review of policy breadth, particularly for combined gynaecological and urological surgery.

Non-adherence to guidelines may represent additional non-documented concern about risk of SSI or further complications on the surgeons behalf; surgeons should be reminded of the risk of complications such as *Clostridium difficile*, MRSA and increased local antimicrobial resistance associated with antimicrobial use.

Previous audit raised concern that co-amoxiclav was often used alone for prophylaxis. This was not found to be a problem in this audit, demonstrating improvement and awareness of the need to give prophylaxis according to likely infective organisms.

Documentation of reason for non-adherence was shown to be poor. Further work and collaboration is required between policy writers and surgeons to review reasons for non-compliance, so that a consensus can be made about documentation standards.

Adherence to guidelines reduces costs. Correct administration of antimicrobials reduces overall consumption, reduces length of hospital stay, reduces penalties and associated costs of surgical site and healthcare associated infections.1,2,4

Encouragingly, adherence to guidelines has improved. Further audit is needed to confirm this improvement. Work must be carried out to improve documentation when policy if not followed. Surgical areas not covered by guidelines have been highlighted, requiring review by combined microbiology and pharmacy teams to amend future policies.

REFERENCES

BPSA CONFERENCE 2012 WINNING POSTER

What lives in your shisha? A microbiological assay of the hookah pipe used to smoke shisha

Daniels I, Isreb M, Hill C, et al
Bradford School of Pharmacy, University of Bradford

Shisha is a type of tobacco, flavoured with fruit and flavourings and soaked in honey and molasses.1 It appears that smoking shisha is becoming more common in the UK, with shisha bars popping up in cities across the country. Participants are allowed to smoke shisha in a trendy bar while eating, drinking, watching TV, listening to music or playing their favourite video games.

It has been found that smoking shisha may carry some of the same risks associated with smoking cigarettes. It has been established that smoking shisha is carcinogenic and has been compared to smoking 100 cigarettes in each shisha session.1 Despite this there is a common misconception that shisha is harmless.2 The World Health Organization acknowledges that smoking shisha may carry additional risks such as a risk of infection due to the routine practice of sharing a pipe.1

Shisha tobacco is not subject to the same regulations as cigarettes and tobacco products in the UK as shisha is an imported product.1 It has been found that only 2% of the surface area of shisha packaging contains a health warning.3 The packaging is brightly coloured and is often displayed and advertised in shop windows alongside ornate shisha pipes.

Table 1: Prevalence of shisha smokers in a northern university

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers of shisha only</td>
<td>13%</td>
</tr>
<tr>
<td>Smokers of shisha and cigarettes</td>
<td>26%</td>
</tr>
<tr>
<td>Smokers of cigarettes only</td>
<td>6%</td>
</tr>
<tr>
<td>Non-smokers</td>
<td>55%</td>
</tr>
</tbody>
</table>

OBJECTIVES
- To assess the infection risk from using a shisha pipe
- To probe into people's attitudes towards shisha smoking and hygiene

METHOD
After ethics approval was granted a survey was conducted within a university with 265 participants to explore attitudes towards shisha smoking and prevalence of shisha smokers. The microbiological assay was conducted using shisha pipes that had been donated and smoked by volunteers in line with ethical approval. Pipes were sealed using sterile equipment to stop contamination of the samples. By inoculating sterile media with samples taken from the shisha pipes colonies could be grown; these would correspond to microbes a shisha smoker may inhale or ingest. A range of media was inoculated to assist in identification. The colonies grown from samples were compared to stock images and known characteristics for identification.

RESULTS
The plates were compared against known characteristics and stock images. The assay revealed a range of bacteria present in a shisha pipe; these included: haemolytic bacteria, anaerobic bacteria, lactose fermenters, non-lactose fermenters and fungi. The presence of a biofilm on the surface of the water bowl was confirmed by the presence of different microbes grown from the water sample and the water bowl surface swabs. The survey showed that 39% of 265 participants smoked shisha; the results also indicated that people who smoke shisha do not always consider themselves to be a smoker.

DISCUSSION
The survey results indicated that a large percentage of the student population smoked. Some interesting comments were added to the survey forms. Among them one participant disclosed that they had started smoking shisha at the age of 13 and had never been asked for identification. This indicates that shisha has an appeal to children, which may be explained by the range of brightly coloured packaging, confectionery flavours and lack of health warnings. These products are displayed in shop windows despite the new laws regarding the display of tobacco products in the UK. A further problem is that some shisha bars are illegal as they do not conform to the UK smoke-free laws. This means that they are often unregistered and may not have the necessary insurance and are not subject to inspection by hygiene inspectors despite the sale of food and drink. A further risk is that a number of participants stated that they did not consider themselves smokers and when questioned said they would tell their doctor that they did not smoke.

The results of the assay show that a biofilm forms on the inside of the water bowl as microbes found in this area are different to those found in the water. In addition to this, microbes appear to move from the water bowl surface to the vapour, through the pipe and to the mouthpiece. If participants were to share the pipe there is a further risk that viruses such as the herpes simplex virus could be transferred between participants.

CONCLUSION
The assay appears to show pathogenic bacteria that could pose a health risk to participants. It would appear that bacteria can move from the biofilm and into the vapour that would be inhaled. The presence of a biofilm in the water bowl demonstrates that it would be difficult to thoroughly clean a shisha pipe and that previous attempts at cleaning had missed the biofilm. Survey results may show that the NHS needs to pay more attention to publicising the risks of smoking shisha. In addition to this perhaps tobacco laws should be enforced on shisha products to limit the exposure of children to shisha paraphernalia.
**REFERENCES**


**BPSA CONFERENCE 2012 WINNING POSTER**

An evaluation of the usefulness of a computerised decision support system in the management of Type 2 diabetes mellitus by students: a vignette study

Ruth Oduneso
School of Pharmacy, Keele University

This single-arm (pretest–post-test) intervention experimental study aimed to evaluate the usefulness of a Type 2 diabetes computerised decision support system (CDSS) in particular groups of healthcare students at Keele University. Computer systems are increasingly popular for clinical decision-making processes because of the evidence for improvements in patient care gathered from research and use in practice. However, despite their advantages, CDSSs are yet to be used for education and training purposes.

**AIM**
The study aimed to evaluate the effects of CDSSs on students and to explore their subjective and objective views about it.

**METHODS**
The intervention was access to CDSS and hypothetical vignettes were used to present clinical scenarios. The inclusion criteria were registration on the following: Years 3 and 4 pharmacy, Years 3 to 5 medicine and Year 3 nursing degrees. This study evaluated the effect of CDSS on 41 healthcare students and also gathered their opinions on the system using questionnaires and semi-structured interviews. Competence, confidence and depth of understanding were evaluated quantitatively while the interview data were analysed qualitatively. Improvements in performance were explored by comparing performance before and after access to CDSS. There were a number of measures but the primary outcome measure was positive changes following CDSS access in the proportion of participants who made the correct decisions on two Type 2 diabetic patient vignettes (A and B). The secondary outcome measure was the applicability and acceptability of CDSS by participants. Ethical approvals for the study were obtained from the relevant schools within the university.

**RESULTS AND DISCUSSION**
Participants found vignette B more challenging than A and this was reflected in the results. For the primary outcome, there was an increase of 78.1% for vignette A but no change was observed for vignette B. With the other outcome measures, improvements in students’ performances were observed for both vignettes. Participants thought CDSS was great and would appreciate having it to supplement their learning.

**CONCLUSION**
The results of this study suggested that CDSS will aid students’ learning, understanding and preparation for future practice, although some scenarios might require participants to have background clinical knowledge.

**REFERENCES**


**REGIONAL PREREGISTRATION WINNING AUDITS**

An audit of NUH compliance with the medicines code of practice policy on restricted access to parenteral concentrated potassium solutions

Hall E
Nottingham University Hospitals NHS Trust, Nottingham

The July 2002 National Patient Safety Agency (NPSA) alert detailed actions that must be taken to reduce the risk of fatalities associated with concentrated potassium solutions. Intravenous potassium chloride concentrate solution can be fatal if given inappropriately. It is widely used and administered intravenously in diluted solutions to treat hypokalaemia and as a maintenance fluid. Patients in critical care settings may require potassium in the form of a very small volume of concentrated solution. Maladministration of potassium-containing solutions is a Department of Health “never event”.2

**AIM**
The Nottingham University Hospitals NHS Trust (NUH) medicines code of practice outlines the policy regarding storage of parenteral concentrated potassium and stipulates which areas are authorised stockholding areas.3,4 This audit aims to provide assurance that the controls in place are working and the policy is being adhered to.

**OBJECTIVES**

- To review the NPSA alert and concentrated potassium policy to define a set of audit standards
- To produce a data collection form based on the standards set to allow information to be gathered annually to determine whether compliance is achieved throughout the trust
- To assess storage of concentrated potassium solutions in all clinical areas of the city campus
- To propose recommendations to the safe use of injectables group if non-compliance is found

**AUDIT CRITERIA AND STANDARDS**

**Standard 1**: 100% of parenteral concentrated potassium solutions are stored in an authorised potassium stockholding area approved by the medicines management committee.

**Standard 2**: 100% of authorised potassium stockholding areas keep parenteral concentrated potassium stock in a locked Controlled Drug (CD) cupboard.

**Standard 3**: 100% of authorised potassium stockholding areas have a designated page in the CD register for concentrated potassium that balances with the physical stock level.

**Standard 4**: 100% of authorised potassium stockholding areas, storing more than one type of parenteral concentrated potassium, keep them segregated (eg, on a different shelf).

**METHOD**
The NUH authorised potassium stockholding areas document was reviewed to identify areas authorised to have stock of the four different preparations of concentrated potassium products. A data collection form was produced and piloted to assess appropriateness. Over one week, 48 areas (both unauthorised and authorised stockholding areas) were audited at city campus. They included 41 wards, three theatres and four cardiac catheterisation laboratories. Clinics, day case, dialysis units and unauthorised stockholding theatres were excluded. The data were collected and analysed, and a percentage of compliance against each audit standard calculated. Ethics approval was not required for this audit project.

**RESULTS**
Table 1 shows the levels of compliance against each audit standard.
DISCUSSION

Standards 1 and 3 achieved 100% compliance. Concentrated potassium is only stored in authorised areas, with CD register entries that balance with the stock. Standard 2 achieved 92% adherence (n=12). Potassium chloride 50mmol/50mL vials were not in the CD cupboard on one ward. The prefixed syringes (PFS) did not fit in the CD cupboard, hence when supplied with vials staff stored them in the same place. This audit was completed while there was a supply problem of PFS and is a limitation to the audit.

Standard 4 requires most improvement. Only one area that stocked more than one product (n=7) segregated the preparations. In some cases segregation may be difficult due to size restrictions of the CD cupboard. Cardiac catheterisation laboratories 2, 3, and 4 never use concentrated potassium yet are authorised stockholding areas. The policy states that potassium chloride 15% must only be ordered on a single named-patient basis for the foetal care unit. This is not being adhered to and 10 ampoules are being issued at a time.

Limitations of the audit are that it was carried out over just one week and that some clinical areas were excluded. Although most theatres were excluded, the pharmacy technician who maintains their stock provides reassurance of compliance.

As a result of this audit the following recommendations can be made:

1. Segregate multiple concentrated potassium preparations where possible
2. Assess the size of CD cupboards that may store PFS to allow compliance
3. Remove catheterisation labs 2, 3 and 4 as authorised stockholding areas
4. Only supply to foetal care unit on a named-patient basis
5. Reaudit annually

In conclusion, the trust is adhering to the concentrated potassium policy in order to satisfy the NPSA requirements. Record keeping and restriction of supply is being well managed. There is scope for improvement, particularly regarding segregation of multiple concentrated potassium products. Segregation good practice will ensure that mix-selection errors are minimised and that every effort is being taken to reduce risk and improve patient safety.

REFERENCES


An audit on the safe use of epidural infusions at North West London Hospitals NHS Trust

Sherreard N, Al-Hasani M
Northwick Park Hospital, North West London Hospitals NHS Trust

Between January 2005 and May 2006 there were 346 incidents nationally resulting in harm or death that involved epidural infusions.1 Although many incidents may result in little or no harm, all have the potential to cause major health consequences to patients, and significant repercussions for hospitals, from a legal and financial perspective. In 2007, the National Patient Safety Agency (NPSA) released a safety alert that highlighted that errors related primarily to epidural infusions being administered by the intravenous route, or vice versa, or the wrong product being selected, resulting in the wrong drug or dose being administered.1 How epidural infusions and devices are labelled, stored and used need to meet standards in order to avoid errors from occurring and to make patient care safer.2

Within the North West London Hospitals (NWLH) NHS Trust, epidural infusions are commenced in recovery during the post-operative period, as well as within the delivery suite for women pre-labour. This audit across the trust — Northwick Park Hospital (NPH), St Mark’s Hospital and Central Middlesex Hospital — was against six NPSA recommended standards, with the aim to promote safe epidural use and ensure patient safety.

OBJECTIVES

■ Audit epidural infusions, administration sets, devices and staff during a one week period, across all wards involved in epidural use within the trust, against NPSA standards: (1) 100% of all epidural infusion bags and syringes must be labelled “For epidural use only” in large font, with judicious use of colour; (2) 100% of epidural infusions must be ready-to-administer epidural infusions; (3) 100% of epidural infusions must be stored in separate cupboards or refrigerators; (4) 100% of epidural administration sets and catheters must be labelled “Epidural” when in use; (5) 100% of infusion pumps and syringe drivers for epidural infusions are easily distinguishable and used exclusively for epidural therapy or, if not, devices should be labelled “For epidural use only” when used for epidural therapy; (6) 100% of all staff involved in using epidural therapy should have received adequate training.

■ Make recommendations to improve adherence to standards if necessary.

METHOD

Ethics approval was not required for this audit. Wards that used epidural infusions were identified using pharmacy computer software, and by contacting a pain nurse to confirm the final list. A data collection proforma was designed, and a pilot conducted across the ward with the highest epidural infusion use (delivery suite, NPH), which proved the proforma successful; no amendments were made. The proforma was taken to each ward, epidurals were examined, and relevant information pertaining to Standards 1 to 3 was filled into the proforma. The ward nurse was asked if any patients were currently receiving epidurals via administration devices, and if epidural devices were stocked on the ward, to allow data collection relating to Standards 4 and 5, respectively. Finally, the ward manager was contacted to allow data collection relating to staff training for Standard 6. Data was then transferred from proformas into a specially designed table in Microsoft Excel, which allowed statistical manipulation of tabulated data and generation of graphs.

RESULTS

Across the trust, a total of 62 epidural infusions were found to be kept on the wards. Of these, 100% adhered to Standard 1, 100% adhered to Standard 2 and 100% adhered to Standard 3. Three patients were receiving epidurals via administration sets during the period of data collection; of these there was 100% adherence to Standard 4. There were 113 epidural devices stocked on the wards, of which 100% adhered to Standard 5. There was a total of 277 staff

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<th>Table 1: Compliance with audit standards</th>
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<td>Audit standard</td>
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</tr>
<tr>
<td>Standard 1: stockholding</td>
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<tr>
<td>Standard 2: storage</td>
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<td>Standard 3: CD register</td>
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<td>Standard 4: segregation</td>
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<table>
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<tr>
<th>Table 1: Adherence of epidural infusions, administration sets, devices and staff to standards</th>
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<tr>
<td>Audit standard</td>
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<tr>
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<tr>
<td>Standard 1: labelling of infusions (n=62)</td>
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<td>Standard 2: infusions ready-to-administer (n=62)</td>
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<tr>
<td>Standard 3: infusions storage (n=62)</td>
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<td>Standard 4: labelling of administration sets (n=3)</td>
</tr>
<tr>
<td>Standard 5: devices used exclusively for epidural therapy (n=113)</td>
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<tr>
<td>Standard 6: adequate training of staff (n=231)</td>
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Audit of day of surgery nil by mouth guidelines

Palmer C, Graham L (supervisor)
University Hospital Southampton NHS Foundation Trust, Southampton

When deciding whether to withhold or continue regular medication perioperatively the following should be considered: the withdrawal potential of the medication, the potential for disease progression if therapy is interrupted, the potential for regular medication to interact with anaesthesia and the doses are clearly documented on drug charts as clinical reason “6”. The trust is compliant with Standards 1 to 5. There is safe, separate storage of, and use of warning labels with colour on, ready-to-administer epidural medicines, across all wards within the trust. Patients who were receiving epidurals were doing so via the correctly labelled and appropriate administration sets. Epidural devices, such as pumps and syringe drivers, were all appropriately labelled and distinguishable. However, the trust is performing below 100% for Standard 6, in the area of staff training.

Most long-term staff had received appropriate epidural training in the form of attending a pain training day, whereas newly started staff had not yet attended. As a trust, it is not acceptable for untrained staff to be looking after epidural patients, even if under supervision. Therefore, one recommendation for improvement would be to shorten the length of time between new staff starting and the training day that takes place, by having more frequent training days, as well as to make attendance mandatory. Some ward managers stated reluctance at sending staff for training that lasted a full day, due to staffing pressures, and felt the current pain training day provided superfluous information, whereas their staff required just epidural training. Therefore, the second recommendation would be for a more succinct, on-the-ward training session tailored to give advice on epidurals, which may be more appropriate and would standardise epidural training for all staff. The third recommendation was to present our findings to our trust’s medicines safety group, and heads of nurses meeting, in May 2012.

A limitation of the audit was the low number of patients receiving epidurals during data collection. However, the results are valid across the entire trust, as all wards that used epidurals were audited. This audit is reproducible; therefore, a re-audit against the same standards would be advisable. Overall, for Standards 1, 2, 3, 4 and 5 the trust is 100% compliant and safe, according to advice set out by the NPSA.

REFERENCES

An audit of antibiotic prophylaxis in gastrointestinal surgery

Hambridge LJ, Davies S
Princess of Wales Hospital, Bridgend

Antibiotic prophylaxis should be regarded as one component of an evidence-based, multicomponent strategy to control healthcare-associated infections and prevent surgical site infections. The Abertawe Bro Morgannwg (ABMU) Health Board secondary care antimicrobial guidelines recommend a maximum of three perioperative antibiotic doses for gastrointestinal (GI) surgery.1 Prolongation of antimicrobial prophylaxis for more than three doses poses a risk to the patient of resistant infections, Clostridium difficile and increases costs.2–3 Clostridium difficile is high on the agenda for the Welsh Government, which recommends that all Welsh health boards should adopt an explicit policy of zero tolerance.4 The ABMU Health Board has set a target of 20% reduction in C difficile cases for 2011/2012.

AIMS AND OBJECTIVES

The aim of the audit was to determine whether the ABMU secondary care antimicrobial guidelines for surgical prophylaxis are being adhered to in GI surgery in terms of choice of antibiotic(s), dose of antibiotic(s) and the duration of prophylaxis. The audit also aimed to establish where surgical antibiotic prophylaxis is prescribed and if the post-operative antibiotic prophylaxis duration is documented.

CRITERIA AND ACCEPTANCE STANDARDS

All prophylactic antibiotic prescribing in GI surgery should comply with the ABMU secondary care antimicrobial guidelines.
METHOD

Data were collected from 7 November 2011 to 27 January 2012, on the surgical wards 7 and 8 of Princess of Wales Hospital (POWH). Ward pharmacists identified patients by inclusion and exclusion criteria, with the data collection being performed by the author using information obtained from the patients' medical records, the patients' medication charts and if required the patient information management system (PIMS+). All data collected were transferred onto Microsoft Excel spreadsheets for analysis. Ethics approval was not required as this was an audit project.

RESULTS

Thirty-three per cent (n=10) of patients were prescribed antibiotics in accordance with the ABMU secondary care antimicrobial guidelines. Twenty-seven per cent (n=8) of patients had antibiotics prescribed that were non-compliant with the guidelines in more than one way, i.e., choice, dose or duration. The most common reason for non-compliance was prolonged duration of antibiotic prophylaxis, which occurred in 57 per cent of patients audited (n=17). In 3 per cent of patients (n=10) the pre-operative dose was prescribed in more than one place. All post-operative doses were prescribed on the regular section of the medication chart. The duration of post-operative prophylaxis was documented for 85 per cent of patients (n=17) who received post-operative doses (n=20).

CONCLUSION

The prescribing of prophylactic antibiotics in GI surgery is not in accordance with the ABMU secondary care antimicrobial guidelines. Areas of inappropriate prescribing include the choice of antibiotic, the dose of antibiotic and the duration of post-operative antibiotic prophylaxis. There is also disparity in where pre-operative antibiotics are prescribed.

The recommendations from this audit are to publicise the ABMU secondary care antimicrobial guidelines to all doctors, to present the findings of the audit to the GI surgical teams, to signpost the ABMU guidelines in the anaesthetic rooms and theatres; to recommend to the antimicrobial advisory group a review of the ABMU antimicrobial guidelines, suggesting their simplification as well as the guidelines stating that all post-operative doses should be prescribed on the STAT section of the medication chart and a re-audit following the implementation of these recommendations.

REFERENCES

1 Abertawe Bro Morgannwg University Health Board. Secondary care antimicrobial guidelines, 2010.
2 Department of Health. Clostridium difficile infection: how to deal with the problem, 2010.

AIMS AND OBJECTIVES

To retrospectively audit “to take out” prescriptions (TTOs) dispensed from a general paediatric ward, without review by a pharmacist, to establish:

Technical accuracy of prescriptions:
1 100% of TTOs should display the correct patient details – name, address, date of birth, patient identification details (PID)
2 100% of TTOs should be signed by the prescriber
3 100% of TTOs should be presented clearly and professionally (This includes correct spelling of each drug, correct units, all text printed clearly and signatures present for the dispensing and accuracy checking of each drug)

Clinical appropriateness of drugs prescribed:
4 100% of prescribed drugs should be indicated for the patient’s medical condition(s)
5 100% of dosing regimen should be appropriate for the patient

METHOD

Data were collected from copies of TTOs dispensed out of hours from a general paediatric ward between 3 February 2009 and 17 November 2011.

Each prescription was reviewed for technical accuracy. The PID was entered into the patient information database on the trust intranet and the details compared with the information on the script. The presence of the prescriber’s signature was confirmed. The spelling and units of each drug were checked against the relevant British National Formulary for Children (BNFC), or trust paediatric guidelines, and the text of the TTO was examined to ensure that it could be clearly read. Finally, the presence of signatures for dispensing and accuracy checking were confirmed.

Each prescribed drug was reviewed for clinical accuracy. Correct indication was verified by comparing the medical condition(s) discussed in the TTO with the drug monograph in the BNFC or trust paediatric guidelines. The appropriateness of the dosing regimen was checked by using the patient’s age or approximate weight, found using the table at the back of the BNFC, to calculate the dose according to that stated in the BNFC or trust paediatric guidelines.

RESULTS

The results are set out in Table 1. 100% of prescribed drugs were indicated for the patient’s medical condition(s). All other standards failed due to incorrect spelling of patient name and incorrect addresses, omission of the prescriber’s signature, poor presentation of TTOs and finally not all dosage regimens were thought to be appropriate for the patient according to their age or weight.

SUMMARY AND CONCLUSION

The results showed that clinically most TTOs were accurate and suitable for the patients that they had been prescribed for. However, the audit demonstrated that technically the prescriptions were not being completed to a high enough standard. This had caused the legality of some of the TTOs to be compromised and the presentation to be confusing or unprofessional. This could lead to misinterpretation in primary care and could therefore lead to inconsistent treatment and sub-optimal patient care.

This audit was limited by the fact that the only information available on the background of the patient was that stated in the diagnosis and findings section of the TTO. Therefore in some cases it was not possible to guarantee whether or not treatment and doses were appropriate for the individual.

Table 1: Percentage of TTOs and medicines that met the required standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Percentage compliance</th>
<th>Standard achieved</th>
</tr>
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<tbody>
<tr>
<td>Correct patient details</td>
<td>85%</td>
<td>No</td>
</tr>
<tr>
<td>Signed by the prescriber</td>
<td>93%</td>
<td>No</td>
</tr>
<tr>
<td>Clearly and professionally presented</td>
<td>63%</td>
<td>No</td>
</tr>
<tr>
<td>Drug indicated</td>
<td>100%</td>
<td>Yes</td>
</tr>
<tr>
<td>Appropriate dosage regimen</td>
<td>90%</td>
<td>No</td>
</tr>
</tbody>
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E. An audit of out-of-hours TTO prescribing and dispensing on a general paediatric ward

Brien SV
Heart of England NHS Foundation Trust, Birmingham

The primary-secondary care interface is a common place for prescribing errors to occur and pharmacists have the knowledge and experience to play a key role in identifying and preventing these. A previous study found that adverse events occur in approximately 20% of discharged patients and that two-thirds of these are related to medication errors. This highlights the importance of accurate prescribing and dispensing, and emphasises the need for trust policies to be strictly adhered to where these activities occur outside of pharmacy hours. A paediatric ward was chosen for this audit as there is potential for more serious errors in this age group. Ethical approval was not required.
The findings of the audit were highlighted at the paediatric junior doctors’ induction and a poster was displayed on the ward, setting out the key points to remember when prescribing and dispensing medication out of hours. These standards will be re-audited in one year’s time.

In the long term, collaboration with the IT department to discuss the inclusion of patient allergy details and weight sections on paediatric TTOs would be beneficial. This would help to ensure that medication is suitable and would enable calculation of an exact dose.

Electronic prescribing for paediatrics may be a possibility in the future, which may reduce the incidence of some of the technical errors underlined in this report.

REFERENCES

The in treatment monitoring and completion of the prescribing chart for unfractionated heparin at Sheffield Teaching Hospitals

Pearce M
Sheffield Teaching Hospitals

Unfractionated heparin (UFH) is a high risk medicine used to provide anticoagulation. It is high risk due to the unpredictable patient response as well as the increased risk of adverse effects such as heparin-induced thrombocytopenia compared to low molecular weight heparins (LMWH). Despite its declining use since the advent of LMWH it is still an important option for certain patient groups. Its use places increased demands on clinicians due to the intensive monitoring that surrounds its use.1

A revised chart specifically for UFH was introduced to Sheffield Teaching Hospitals (STH) in 20092 following problems surrounding its prescribing previous to this. This aimed to clearly state what needs to be tested, when and provide a clear means of recording what rate of UFH the patient had received and what their APTT test results were.

OBJECTIVES
- To establish if the pre-treatment checks are carried prior to administration (patient weight, full blood count, coagulation screen, renal function)
- To assess the extent to which in-treatment monitoring is being performed correctly and being actioned appropriately, ie, activated partial thromboplastin time (APTT) tests taken at the appropriate intervals as shown on the chart and the appropriate action taken on them
- Loading dose given as appropriate with exclusion criteria for it clearly documented in patient notes

METHODS
Stratified retrospective sampling of patient’s medical notes and test results3 of patients who received UFH between 23 January and 5 June 2011. Data were recorded using a proforma designed to address the criteria and standards of the audit. All patient data were anonymised by keeping a record of any patient identifiers separately to any of their medical information and this information was stored on a private area of the trust network. Approval was obtained from the trust Caldicott guardian, ethics panel approval was not required.

RESULTS
The results are set out in Table 1. The testing and record keeping surrounding APTT testing was the area of greatest concern found in the audit with only one patient among the sample of patients receiving 100% of their APTT tests within the time periods set out and further breakdown showed just 16% of patients had 50% or greater compliance with this standards. In addition to this the recording of the administration was often omitted. Just 10% of patients had their administration section 100% correctly completed. These may to some extent be due to the significant burden of paperwork and monitoring surrounding UFH use but it poses a serious problem with regard to keeping a clear picture of what the patient has received and when.

DISCUSSION AND CONCLUSIONS
Some areas of good compliance with the chart completion and in-treatment testing (full blood counts) but areas which were cause for concern included low levels of compliance with pre-treatment blood tests, conducting in-treatment tests on time and correct documentation surrounding of administration.

The outcomes from the audit should be a drive to help improve the practice around the use of UFH by educating those involved where appropriate, improving the usability of the current chart and highlighting the areas in which compliance was lowest and the clinical risk to the patient is the greatest. In particular a tick-based box in relation to the pre-treatment testing would help to prompt prescribers to ensure these are completed to a greater extent and a review of the usability of the chart with nurses who frequently have to complete it. The possibility of the laboratory reports stating the change in rate and when the next level needs to be taken could also be used to reduce some of the burden placed on the ward staff.

REFERENCES
2 Sheffield Teaching Hospitals STH UFH infusion treatment charts (Intranet) (Issued January 2011).
3 Sheffield Teaching Hospitals. Patient notes, results reporting system (ICE).

The financial and clinical implications of ciclosporin brand-generic switching in the dermatology directorate

Robertson P (supervisor Lamerton E)
Salford Royal NHS Foundation Trust

Ciclosporin first entered clinical use three decades ago as a revolutionary agent for the prophylaxis of organ transplant rejection that was capable of dampening the immune response without cytotoxic activity. The potential application of ciclosporin in dermatology was identified serendipitously in 1979, where the drug not only acted as a novel therapeutic option but helped redefine our understanding of the pathophysiology of many dermatoses. Despite undeniable efficacy, clinical uptake was hindered by its narrow
therapeutic index, unpredictable pharmacokinetics and sometimes severe side effects of hypertension and renal toxicity. In 1995, Novartis produced a micro-emulsion formulation of ciclosporin (Neoral) that greatly improved the pharmacokinetic reliability of the drug,1 making ciclosporin a much more viable treatment option. As a function of this reliability and promises of improved safety, the Neoral product has held market dominance since soon after its introduction. Recently, the emergence of generic micro-emulsion formulations (Capimune and Deximune) that claim to produce near-identical pharmacokinetic profiles at a fraction of the cost are becoming an attractive alternative to Neoral. Any cost savings made through brand-to-generic switching should be seen as benefiting the NHS economy as a whole through allowing for the reapportionment of funding within the NHS and, should brand-generic switching be successfully extended within the Salford Royal NHS Foundation Trust (SRFT), it will set the precedent for other trusts to adopt similar policies. Although the potential cost savings cannot be ignored, such brand–generic switches carry additional clinical and ethical considerations and great care must be taken not to compromise patient safety.

Based on current trust guidance, agreed in October 2011, the only patients who qualify for treatment with generic ciclosporin must have a confirmed diagnosis of plaque psoriasis and must have never received ciclosporin in the past.

**OBJECTIVES**

To provide a literature review of the clinical implications of ciclosporin brand-generic switching and to provide trust-specific data on the potential cost-savings brand-generic switching would bring in dermatology.

**METHOD**

Issues of ciclosporin recorded on the pharmacy system at SRFT, for both inpatients and outpatients, were examined between November 2010 and November 2011. Data pertaining to the financial expenditure were obtained from the ASCrbe dispensary management system as a Microsoft Excel Workbook (using current SRFT contract prices). To this workbook, columns were added to accommodate information gained from clinic letters (for which ethics approval was gained) using the iSoft Electronic Patient Record (EPR) system under the headings of indication for use, length of supply (days), daily dose (mg) and previous treatment with ciclosporin.

**RESULTS**

In the time period investigated, 96 patients were initiated with ciclosporin who were naïve to ciclosporin therapy. Of this population, 56 patients were started for the treatment of plaque psoriasis and as such would have qualified for a switch under the current trust guidelines. A further 11 patients were newly started for another form of psoriasis and, thus would qualify under the licences of Neoral, Capimune and Deximune. Seventeen patients were prescribed for severe eczema and would have a licensed indication for Neoral, Capimune and Deximune usage. Finally, 12 of these patients were prescribed for an unlicensed indication regardless of the formulation used. With respect to the financial cost during this time period, the expenditure to patients newly prescribed ciclosporin according to the ASCrbe data was £48,337.64. Since the total ciclosporin expenditure was £195,200 the portion exclusively attributable to newly started patients was 24.8%. Of this portion of the total expenditure dedicated to new patients 57.3% (£27,694.64) (being treated for plaque psoriasis) and therefore could have been initiated on Capimune (based on current trust policy). Using these patient populations and the figures quoted previously for contract pricing of Capimune, potential savings to the trust can be estimated. Had each patient newly started on ciclosporin for plaque psoriasis been given Capimune for the duration of their treatment expenditure would be ~£7,957 (~28.7% of the cost expected with Neoral). Patients newly started on ciclosporin for an off-label indication are responsible for of the total ciclosporin expenditure (£195,200).

**DISCUSSION AND CONCLUSIONS**

Clinicians appear to be exercising caution in prescribing their patients Capimune; since its formulary approval in October, 13 prescriptions were dispensed to patients for Neoral who would have qualified for treatment with Capimune, yet only two boxes of Capimune had been issued to patients. This apparent reluctance could be attributed to a number of potential root causes. Among these it should be borne in mind that prescribing consultants have a much greater familiarity with the Neoral brand and may feel uncomfortable prescribing new patients Capimune due to a perceived lack of quality assurance. It must be borne in mind throughout the prescribing process that both Capimune and Deximune have achieved licensed generic status in the UK and should be viewed as non-inferior products. The process of dosage titration appears to vary considerably between patients and depends on the conditions being treated. Although no consistent data was gained from this study that would describe these fluctuations in detail, it did appear that the notion of “stabilising” a patient on ciclosporin is more appropriate in the prophylaxis of transplant rejection than the management of inflammatory dermatoses. Ciclosporin doses in dermatology are titrated to patient response and tolerance, not blood ciclosporin levels, and as these courses tend to be limited to a few weeks, even patients previously treated with ciclosporin therapy may, with the patient’s approval, qualify for a brand-generic switch to a cheaper alternative to Neoral. To encourage generic ciclosporin usage patient inclusion criteria should be extended to include patients diagnosed with severe eczema who have not yet received Neoral previously (reducing expenditure from ~£8,532 to ~£1,747 (~80% reduction)). As SRFT is a tertiary referral centre for dermatology patients, a significant portion of the sample population received ciclosporin off-label for an unlicensed indication. Generic ciclosporin is a no less valid treatment option than branded ciclosporin in this case, therefore any patients prescribed ciclosporin off-label who have not yet received Neoral should be treated with Capimune (reducing expenditure from ~£11,999 to ~£2,344 [81% reduction]). Depending on the success of this extension of inclusion criteria, consideration could then be made towards switching patients previously with Neoral, with an ultimate goal of rolling out a total switch from Neoral to Capimune, reducing ciclosporin expenditure from £195,200 to ~£42,143.

Although the bioequivalence of the new generic formulations is strongly supported by their licensed generic status and the potential cost savings are incontrovertible, the decision to switch from branded to generic product should be led by the clinical team. Using careful evaluation of individual patients, along with providing appropriate patient counseling on the particulars of brand-generic switching, inclusion criteria for generic ciclosporin therapy can be extended, thus reducing pharmaceutical expenditure in the dermatology directorate.

**REFERENCES**


O’Mahony M, Beaney A, Black A

Newcastle Upon Tyne Hospitals NHS Foundation Trust

European Council Directive 2010/32/EU, “Implementing the framework agreement on prevention from sharp injuries in the hospital and healthcare sector between European Hospital and Healthcare Employers’ Association (HOSPEEM) and the European Federation of Public Services Unions (EPSU)”, has given rise to some concerns in the UK, as it may result in an outright ban on resheathing needle-sticks for health and safety reasons. Member states have until 11 May 2013 to implement the legislation set out by this Directive. The Directive will apply to all workers in the hospital and healthcare sector,1 including staff working in pharmacy aseptic units and radiopharmacies, where needle resheathing is currently common practice.

**AIMS**

To undertake a risk assessment to demonstrate the impact of a ban on resheathing in pharmacy aseptic units
An audit to assess compliance to trust guidelines for the use of morphine and fentanyl intravenous patient controlled analgesia

Radford L (supervisor Lam A)
Barts Health NHS Trust

Winner of Pfizer Best Pre-registration Poster Award (see pS8)

Timely administration of prandial insulin to diabetic patients during hospital admissions

Young L, Green C
Norfolk and Norwich University Hospital, Norwich

In the UK, there are believed to be 2.9 million adults living with a diagnosis of diabetes. It is estimated that the cost of diabetes to the NHS is £1billion/hour or £16,666/minute. Insulin is often essential to maintain suitable blood glucose levels. Timing of prandial insulin administration may affect the health of the patient and reduce the number of hospital admissions. Suitably timed injections may be one way of reducing diabetes related hospital admissions and thus saving the NHS money.

A recent National Patient Safety Agency alert highlights the need for systems to be in place that enable inpatients to self-administer insulin where feasible and safe. They concluded that this should reduce the harm associated with incorrect timing of insulin administration. A further study assessed the accuracy of timing when the patient self-administered compared to when the nurses administer. The results showed that patients were much more accurate. In 2011, a study on insulin listed “incorrect timing” as a commonly reported error.

There are no guidelines or standards set at the Norfolk and Norwich University Hospital (NNUH) relating to administration of prandial insulin. It is believed that most insulin is administered by the nurse. By disempowering patients to administer their insulin and through inconsistency due to shift changes, we may be introducing risks to patients resulting in more complex admissions. At the March 2010 Diabetes UK poster conference it was noted that ward staffing levels affect the accuracy of insulin administration. It is suggested that the accuracy of insulin administration can be improved by enabling patients to self-administer their insulin.

AIM
To audit the accuracy of the timing of prandial insulin administration to inpatients with diabetes

OBJECTIVES
1. To compare the time of insulin administration to the time the patient received their meal

REFERENCES
To determine whether the insulin is being administered by the patient or the nurse and to see if this affects accuracy

To assess patients preference for patient/nurse administration

To assess patient satisfaction with the timing of the insulin administration

**METHOD**

Standards have been defined using the summary of product characteristics and the BNF 62 (September 2011). 100% of patients with diabetes receive prandial insulin at the recommended time depending on insulin as follows: up to 10 minutes before or soon after a meal for biphasic insulin aspart; up to 15 minutes before or soon after for biphasic insulin lispro; 30 minutes before a meal for human biphasic isophane insulin; up to 10 minutes before a meal or shortly after for insulin aspart; up to 15 minutes before a meal or shortly after for insulin lispro.

**RESULTS**

30 patients from both medical and surgical wards were included which will be sufficient to make valid comparison to the standards.

72 insulin administrations were recorded (45 patient and 27 nurse). Although 69% of all administrations met standards, 91% (+/- 8.3%) of self administrations were within the recommended time compared to only 33% (+/- 17.7%) of nurse administrations (Table 1). 83% of patients felt that the timing of their insulin was appropriate and 93% patients felt that the correct person administered it. This suggests patients are satisfied with their insulin administration while in hospital.

**DISCUSSION**

The results of this audit agree with the results of previous studies: allowing patients to self-administer does improve the accuracy of the timing. Nurse administration is much less efficient with 66% patients receiving insulin outside the recommended time. Although 83% of patients felt that the timing of their insulin was appropriate, when comparing to standards, only 58.8% of patients actually received it at the recommended time. This may highlight the need for further education for diabetic patients.

It is important to note that the standards set are recommendations and that timing may be based on clinical condition. In an attempt to accommodate this, where patients received their insulin outside the recommendation, I examined reasons for this. In no cases did patients state it was due to hypo- or hyperglycaemia. Reasons included nurse not bringing insulin and insulin not being ordered.

The study was not without limitations. The most significant was the recruitment process. This may be due to increased usage of long-acting insulin only or that staff were too busy. A larger sample size would have been more representative and allowed greater generalisation of the results. Another drawback was that patients needed to be well enough to complete the data collection form meaning confused and acutely unwell patients were excluded.

Suggestions for the future would be to empower inpatients to administer their own insulin, to allow the patient to keep their insulin on their person, and to develop a more robust way of logging patients in the hospital that are using insulin.

**REFERENCES**


2 Diabetes.co.uk. Cost of diabetes. diabetes.co.uk/cost-of-diabetes.html (accessed 6 February 2012)


**Table 1: Comparison of patient and nurse administration of prandial insulin**

<table>
<thead>
<tr>
<th>Person administering</th>
<th>Number (percentage) of administrations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Appropriate time</td>
</tr>
<tr>
<td>Patient</td>
<td>41 (91%)</td>
</tr>
<tr>
<td>Nurse</td>
<td>5 (33%)</td>
</tr>
</tbody>
</table>

**What a waste: an audit on waste medicines in an inpatient and outpatient setting**

Nettey V

Oxleas NHS Foundation Trust

Approximately £300m per year out of an NHS budget of £8.1bn accounts for NHS primary and community care prescription medicines wastage in England. It is believed that between 30 and 30 per cent of the volume identified of this amount is preventable.1 In primary care, a number of campaigns, audits and reports have been carried out,2,3 but there has been less attention in the hospital setting regarding waste medicines.4 In the Oxleas NHS Foundation Trust, roughly £250,000 worth of waste medicine comes back to the pharmacy annually.

Reasons for medicines wastage vary; they range from patient to prescribing factors as well practices within hospitals and pharmacies. Though there is an inevitability associated with medicines going to waste for certain reasons (eg, medication stopped or changed and death), there are numerous situations where it is preventable. The audit was done to get a snapshot of the reasons for medication being returned to the pharmacy and the cost incurred by the trust. As this was an audit project and patient details not recorded, ethics approval was not required.

**AIMS**

- To find out the amount and cost of waste medicines returned to the pharmacy from an inpatient and outpatient setting
- To discover the underlying reasons behind medicines being returned to the pharmacy
- Recommend ways of helping to reduce waste of medicines after analysis of the results

**OBJECTIVES**

- To establish the quantity and the cost of medicine that is returned (stock and patient specific) to the pharmacy for disposal over a four-week period.
- To establish the reasons for the returns and if they were patient specific, determine this through RiO (the Oxleas clinical information system) or via telephone.

**AUDIT STANDARD**

- There should be no preventable waste.

**METHOD**

Waste medicines returned from both units to the pharmacy were assessed over a four-week period, from 12 December 2011 to 6 January 2012. This was presumed to consist of patient-specific medicine as well as stock items. All returned medicines were recorded under their brand, the quantity returned for each medication and its cost. The cost of each medicine returned was obtained from the stores department in the pharmacy using the Ascribe computer system. The cost of the medicine did not include VAT.

RiO records were then used to check patient specific medication in order to try and determine the reason for them being returned. If there were no details on RiO, then telephone contact was to be made with the person responsible for the care of the patient to determine a reason.

**RESULTS**

Preventable waste was classified as excess medication (eg, over-ordering), medication not collected and the patient being discharged or transferred to another unit or ward. They are highlighted in italic in Table 1.

No national standards in relation to waste medicines could be found so the standard was set with the aim that there should be no preventable waste. From the audit, the amount of medicines waste received in the pharmacy that was preventable from the inpatient ward and the outpatient unit was 80% and 53%, respectively (Table 1). The standard that was set regarding the reason for medication being returned was therefore not met. The total cost of waste
received in the pharmacy (without VAT) was £350.50 for the inpatient ward and £825.17 for the outpatient unit.

**DISCUSSION**

It should be noted that both the figures for cost and quantity only accounted for medication that was returned to the pharmacy. There was the possibility of wastage between when the medication was transferred to another ward and when it was reordered. Additional time would have provided more comprehensive and clearer data.

The recommendations that have been made as a result of this audit are, in order of priority: first, creating awareness on the wards and highlighting the cost of medicines and medication wastage to the appropriate healthcare professionals; secondly, developing a workable system to ensure a patient’s medication is transferred with them when they transfer to another ward. It is important to work with the acute (psychiatric) wards to try to make the TTOT/discharge system more efficient. Down the line, exploring systems in community mental health centres (CMHCs) that can help with stock control and early identification of poor adherence will help improve the use of medicines, reduce wastage and promote efficient prescribing. Revisiting systems to encourage use of appropriate medication a patient brings into hospital with them can also be considered. A reaudit can be carried out once the changes have been put in place and implemented for a reasonable amount of time.

**REFERENCES**


**Table 1: Audit results**

<table>
<thead>
<tr>
<th>Reason for return</th>
<th>Number (percentage) of returns</th>
<th>Inpatient unit (n=20)</th>
<th>Outpatient unit (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharged/transferred</td>
<td>16 (80%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excess medication</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication changed</td>
<td>1 (10%)</td>
<td>10 (38%)</td>
<td></td>
</tr>
<tr>
<td>Medication stopped</td>
<td>1 (5%)</td>
<td>3 (12%)</td>
<td></td>
</tr>
<tr>
<td>Not collected</td>
<td>—</td>
<td>3 (12%)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>2 (10%)</td>
<td>2 (8%)</td>
<td></td>
</tr>
<tr>
<td>Other (supply switched to community)</td>
<td>—</td>
<td>1 (3%)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 1: Comparison of knowledge based questions results in Section 3 of questionnaire**

<table>
<thead>
<tr>
<th>Knowledge-based Question</th>
<th>Pre Parkinson’s training</th>
<th>Post Parkinson’s training</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>79.46</td>
<td>97.61</td>
</tr>
<tr>
<td>2</td>
<td>50.00</td>
<td>95.23</td>
</tr>
<tr>
<td>3</td>
<td>30.70</td>
<td>71.42</td>
</tr>
<tr>
<td>4</td>
<td>68.10</td>
<td>78.57</td>
</tr>
<tr>
<td>5</td>
<td>58.97</td>
<td>95.23</td>
</tr>
</tbody>
</table>

Enhancing the pharmaceutical care of patients with Parkinson’s in the Western Health and Social Care Trust

Walsh M, Morrissey E, Kirby G, Parkhill S, King K, Friel A Pharmacy Department, Altnagelvin Area Hospital, Derry

In February 2010, the National Patient Safety Agency released an alert on reducing harm from omitted and delayed medicines, this alert specifically recommended that Parkinson’s disease (PD) medicines be included as being on critical medicines list. Parkinson’s UK highlighted to the Western Health and Social Care Trust (WHSCST) trust that PD patients often do not get their medication on time when admitted to hospital. The “Get it on time” campaign was launched by Parkinson’s UK in April 2006. Its aim is to make sure that people with Parkinson’s while in hospital get their medication on time, every time. This campaign was launched with the key objective to ensure Parkinson’s patients get their medication on time to avoid their Parkinson’s becoming uncontrolled, to shorten hospital stays, and to reduce the chances of people being readmitted after being discharged from hospital and reduce the burden on ward staff.

**OBJECTIVE**

To initiate a multidisciplinary care pathway for Parkinson’s disease sufferers within WHSCST that will ultimately enhance the pharmaceutical care of this group of patients and to successfully implement the “Get it on time” campaign at ward level.

**METHOD**

A consultation was conducted with Parkinson’s UK and specialist Parkinson’s nurses to identify issues requiring urgent attention for PD patients within secondary care. Multidisciplinary focus groups were conducted to ascertain the perceived need and desire for PD training within Altnagelvin Area Hospital. A questionnaire containing open and closed questions and a visual analogue scale (VAS) was distributed to nursing staff both pre- and post-training to determine their knowledge of PD.

A training programme was developed on PD and anti-parkinsonian medication and delivered to nine wards using PowerPoint presentation throughout February 2012. A guideline was produced, detailing how to care for a PD patient on admission to hospital.

Ethics approval was not required for this project.

**RESULTS**

There was a multidisciplinary agreement on the need for an educational training programme to improve the knowledge of nursing staff and this would be supported at ward level.

Post-training questionnaires indicated a definite improvement in nursing staff’s knowledge of Parkinson’s disease by comparing the results of the knowledge based questions in section 3 of the questionnaire (Table 1).

A t-test was used to measure the results from the visual analogue scale whereby nursing staff marked on a 10cm line what they believed their perceived knowledge of Parkinson’s disease to be before and after training. The mean score of the visual analogue scale was 3.9/21.8 before training was carried out versus 8.4±0.7 after training had been completed. P<0.001 therefore demonstrating that the training had a statistically significant impact.

Information packs developed in association with Parkinson’s UK have been placed on each ward and are used as a reference source for nursing staff. Feedback from Parkinson’s UK was very positive and it is keen to ensure that the work continues and progresses.

**DISCUSSION**

The training programme was well received within Altnagelvin Hospital and efforts are continuing to implement the “GIOT” across all wards in WHSCST. Nursing staff have a better understanding of PD and the pharmaceutical aspects of effective medicines management for patients and utilise the expertise of family members to obtain best results.

**REFERENCES**

A retrospective audit of total parenteral nutrition use at Milton Keynes Hospital NHS Foundation Trust

Mak K
Preregistration Pharmacist, Milton Keynes Hospital NHS Foundation Trust, Milton Keynes

Total parenteral nutrition (TPN) is an intervention that should only be initiated after careful consideration due to the invasive nature of treatment, risks associated and costs. Clinical guidelines from the National Institute for Health and Clinical Excellence (NICE) detail the criteria for assessment and prescribing of parenteral nutrition (PN). 1 According to a National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report in June 2010, 28.7% of patients studied did not have an appropriate indication for PN and only 19.5% of the patients had PN care that NCEPOD advisors considered good practice. NCEPOD also found that 43.3% of patients had inadequate monitoring, and 39.3% of patients experienced metabolic complications. 2

OBJECTIVES

The aim of this audit was to review the local use of PN to ascertain that PN is appropriately prescribed to ensure adequate patient care and cost effectiveness. The audit had the following as its objectives:

- To determine that the indications for prescribing PN in adult patients were documented and compliant with NICE guidelines
- To establish that adequate care was conducted before the prescribing and administration of PN and that regular monitoring and review was carried out
- To ascertain that patients had the appropriate intravenous line inserted according to the type of PN prescribed and that peripheral PN is used in the short-term only
- To document the common types of non-metabolic and metabolic complications encountered at MKHFT and determine the percentage of patients who experienced complications

The standards for this audit were obtained from NICE, 1, NCEPOD 2 and European Society for Clinical Nutrition and Metabolism (ESPEN) 3 guidance documents, and are as follows:

- 100% of patients should be appropriately assessed for TPN against the prescribing criteria by a healthcare professional competent in this field before initiation of TPN
- 100% of patients should be prescribed TPN for an appropriate indication as set out by NICE and NCEPOD
- 100% of the patients should be monitored daily initially, reducing to twice weekly when stable
- 100% of patients should have the appropriate line inserted depending on type of TPN
- 100% of the patients should not have peripheral PN for more than 14 days
- At least 90% of PN should be started on weekdays during normal working hours (9am–5pm).

METHOD

The study population consisted of adult inpatients over the age of 18 who had TPN prescribed and administered to them between the six-month period of 1 April to 30 September 2011, inclusive, for a minimum of one day. Patients receiving home PN when admitted and children under the age of 18 were excluded. Eligible patients were identified retrospectively using pharmacy dispensing records and administration records in the Department of Critical Care (DoCC). Ethical approval was not required for this audit.

Data collection was performed using a short questionnaire adapted from the NCEPOD PN study patient care questionnaire. As part of the audit process, the data questionnaire was initially tested and refined prior to initiating data collection. Data were collected using the questionnaire by the investigator from the following sources:

- Prescribing and monitoring records updated by dieticians and the Advanced Nurse Practitioner for Nutrition
- Patients’ medical records (drug charts, clinical, nursing and nutrition notes)
- Trust biochemistry results system (for reviewing biochemistry results for information on metabolic complications)

RESULTS

A total of 56 patients aged from 24 to 92 years were identified, consisting of 26 males (46%) and 30 females (54%). 39% of patients were given TPN on DoCC, 43% on mixed medical/surgical wards, 16% on medical wards and 2% of which could not be identified.

All 56 (100%) patients were assessed for PN based on clinical grounds, biochemical review and patient weight. 100% of indications were appropriate for PN. The indications included obstruction, post-surgical complications, perforated or leaking gut, cancer, post-operative ileus, no access for or failure of enteral nutrition, infection, non-functioning gut, Crohn’s disease, fistulae, malabsorption, Stevens-Johnson syndrome, dysmotility, pre-operative nutrition, ulcerative colitis and bowel rest. Patients were reviewed twice a week by dietitians and an advanced nurse practitioner, and reviewed once a week by doctors and as needed. Pharmacists review the prescription daily with regards to supply of TPN and alert dietitians or doctors as necessary for a review. 100% of the patients had the correct mode of PN delivery. All patients who were prescribed peripheral PN had it for less than 14 days before they were stopped or switched to central PN. All decisions to start PN in the patients reviewed were made during normal working hours (Monday to Friday, 9am to 5pm).

DISCUSSION

To summarise, 100% compliance was attained for all six audit standards measured. This reflects that the trust had been prescribing PN appropriately and has been adequately assessing, reviewing and monitoring patients. An average of approximately 100 patients are administered TPN annually at MKHFT, and so the sample size of 56 was reasonable for a six-month period. Most patients receiving PN were patients undergoing surgery and/or critical care patients, indicating complex surgical problems and multiple comorbidities that necessitate nutritional support. Overall, 35.7% of patients experienced metabolic complications while on PN. This is similar to the rate reported by NCEPOD (39.3%).

Due to the retrospective nature of the audit, the investigator was reliant on the records made by clinicians or other health professionals. A prospective audit would improve the validity of the data collected as there would be an opportunity for the investigator to observe the decision-making processes, resulting in a better reflection of practice. However, a retrospective audit was the preferred choice due to time constraints.

REFERENCES


An audit of the dispensing practices of “to take away” packs at Torbay Hospital

Dove V

Torbay Hospital, Torquay

Dispensing can be defined as “the provision of drugs or medicines as set out properly on a lawful prescription.” 1 The usual means of dispensing is to have...
medicines prepared, dispensed and checked by a member of pharmacy staff. However due to sheer demand for bed spaces and procedures such as rapid discharge, this is not always the case.1

Prepacked medication is medication that has been labelled by the hospital pharmacy department. The labels include the drug name, strength, quantity and directions for use. Gaps are left for the patient name and date of dispensing to be added at ward level. They are often referred to as “to take away” (TTA) packs. Provision of TTA packs allows nurses to dispense standard items against a prescription, which can facilitate rapid discharge. TTA packs are currently on 10 wards at Torbay hospital. There should be a clear record of dispensing of all TTA packs. However, the principal pharmacist was unsure whether this was currently taking place. An audit therefore was devised to establish whether dispensing standards were being upheld by the nursing staff.

AIM
To look at the procedure of issuing TTA medications on wards at the hospital to see whether the processes in place are safe and appropriate.

OBJECTIVES
The audit was designed to measure the following five standards:

- 100% of TTA pack medication should be stored separately to ward stock
- 100% of nurses dispensing a TTA prescription should have a second checker to check their dispensing
- 100% of wards that keep TTA packs should have a record or all medication given out
- 0% of ward stock should be used to create a TTA pack for dispensing
- 100% of dispensing nurses and the second checker should sign accountability on the product, the prescription and in the record book

METHOD
A questionnaire was devised by the auditor and principal pharmacist to look at the dispensing and recording of TTA packs at Torbay Hospital. The questionnaire was piloted in December 2011 and the reviewed questionnaire distributed to all 10 wards that keep TTA packs in January 2012. Ethics approval was not required because this was an audit.

Table 1: Audit results
<table>
<thead>
<tr>
<th>Question</th>
<th>Words that said yes</th>
<th>Words that said no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a second checker procedure in place</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Is ward stock used to create TTA pack medication for discharge</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Do you have a record book for dispensing TTA packs</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

RESULTS
All 10 wards had adequate separation of TTA packs and ward stock. Only half of the wards kept a TTA record of TTA pack dispensing. Table 1 shows the number of wards that kept records of dispensing and those wards that would pack down ward stock to create discharge medication. Four of the 10 wards did not have a second checker system in place.

DISCUSSION
All 10 wards had separate storage for their TTA packs and ward stock; this reduces the chance of dispensing unlabelled ward stock. Four wards did not have a second checker in place; this is unsafe and increases the risk of dispensing errors and therefore harm to patients. Five of the wards did not keep a record of TTA packs given out to patients; a record book should be kept on each dispensing ward so that each TTA pack given to patients is recorded and therefore can be accounted for. Of the wards asked, 50% would pack down ward stock to create TTA packs. This is extremely unsafe and could lead to patient harm. Only TTA packs issued to the wards have been deemed safe for nurses to dispense. One study identified that hospital pharmacists detect errors in around 1.5% of prescription items written.2 If a nurse is making their own TTA packs for unapproved medication, errors such as drug interactions and incorrect dosages may not be picked up. It is essential that prescriptions for items not kept as TTA packs must be sent to pharmacy for dispensing. Signing accountability leaves a dispensing trail and allows risk reduction measures to be put in place if an error is found. Only one ward had a policy of the dispenser and second checker signing the prescription, product and record book.

CONCLUSION
Only one of the audit standards was achieved at Torbay hospital and therefore the audit highlighted the need for change in the dispensing, and recording of TTA pack medication. Emergency meetings have occurred as a result of the audit to highlight the unsafe dispensing of ward stock by nurses. As a result of the meetings, training programmes for nursing staff have been started and each ward without a record book has been issued one.

REFERENCES
3 Barber N, Rawlings M, Dean Franklin B. Reducing prescribing error: competence, control, and culture. Quality and Safety in Health Care 2003;12:i29–i32. bmj.com/content/12/suppl_1/i29.full (accessed 20 February 2012).