Boehringer Ingelheim Respiratory Award 2008

Chronic obstructive pulmonary disease: using patients perceptions to improve symptom control and quality of life outcomes

M Ledger-Scott, L Tadros, C Bradley, C Oates
County Durham and Darlington NHS Foundation Trust

Background
Chronic obstructive pulmonary disease (COPD) is a progressive, debilitating and often fatal disease with limited treatment options that can improve quality of life or control disease symptoms. Management of COPD is complex, with patients needing to make behaviour and lifestyle changes including smoking cessation and exercise therapy along with optimal medication adherence.

COPD patients have been found to be non-adherent with their treatment recommendations both intentionally and unintentionally. Poor adherence to drug therapy is a major factor resulting in emergency hospitalisation among COPD patients. Several factors predispose COPD patients to non-adherence. Patients are more likely to adhere to treatments when they perceive the recommended treatments are compatible with their personal beliefs about the illness and their experiences with past illness and/or current symptoms. Patient decisions to follow the recommended treatment are influenced by their beliefs about medicines as well as their beliefs about the illness that the medication is intended to treat or prevent.

It is increasingly evident that outcomes such as symptoms, exacerbations, patient perceptions and health-related quality of life (HRQL) are at least as important as changes in lung function in COPD management. The importance of such patient-centred outcome measures has been acknowledged in the British Thoracic Society guidelines and in the recently updated Global Initiative for Chronic Obstructive Lung Disease (GOLD) management guidelines, which emphasise that the extent to which the goals of effective COPD management can be realised varies with each individual patient. However, little attention has been paid to, or work done, on the patients' perspectives of effective disease management in COPD and how this affects adherence to therapy and outcomes.

Objective
The objective of the study was to determine if clinical outcomes and quality of life could be improved in COPD patients by focusing on patient-centred outcomes.

Method
Fifty patients attending their first hospital outpatient respiratory clinic within two weeks post discharge and who met agreed inclusion criteria were recruited to the study and referred to the independent prescriber pharmacist clinic by the consultant.

Inclusion criteria were as follows: primary diagnosis of moderate-to-severe COPD according to the generally accepted clinical and functional criteria, a history of at least two hospital admissions during the previous year due to COPD exacerbations, frequent use of antibiotics, and failure to quit smoking.

At baseline the following data were obtained: forced spirometry (FEV1), number of hospital admissions and number of GP visits due to recurrent infections which warranted a course of antibiotics and steroids in the past 12 months. Quality of life was assessed using the St George's Hospital Respiratory Questionnaire 10 (SGRQ).

The pharmacist worked with each patient, using the patient's perceptions of their disease and medicines to engage them in an individualised educational programme and management plan that would improve their management of their disease and provide them with the outcomes that they wanted to improve their quality of life.

After a 12-month period the same variables were assessed as in the initial evaluation for all patients.

Results
At the end of 12 months the respiratory consultant reviewed all patients and outcomes. At the end of the study there was significant improvement in FEV1; value from a mean of 56.1% to 62.7%, statistically significant (P<0.0007) using t-paired two sample for means.

There was a 72% reduction in GP visits and antibiotic prescribing, there was an 89% reduction in number of exacerbations and an 88% reduction in hospital inpatient bed days.

According to SGQR, used as a quality-of-life measurement, there was a 45.2% improvement in symptoms, 62.5% improvement in activity and 67.4% improvement of the impact of the disease on their daily lives.

Discussion and conclusion
The patients in the study had all been treated for COPD for a number of years and had all been in hospital with acute exacerbations a number of times.

The study differed from previous clinical interventions in that the patients perceptions of the disease, treatment and desired outcomes were paramount in determining their COPD management plan. The study looked beyond the traditional endpoints for COPD (for example, effects on lung function) and considered the outcomes that matter most in patients' daily lives. Although improving lung function is an important goal of COPD management, patients do not complain of poor lung
The independent prescribing pharmacist was able to identify and rectify drug-related problems (caused by any of the patient's medicines, not just those used to treat COPD), immediately initiate new medicines compatible with the patient's beliefs to ensure concordance, then set up an individualised education programme and disease management plan based on the disease severity, symptom control, the patient's environment, exercise levels, and any compliance problems.

Both clinical outcomes and patient-centred outcomes were improved. Focusing on patients' perceptions of what constitutes effective disease management in COPD motivated patients to achieve their own desired outcomes. Patients improved their adherence to the jointly developed disease management plan, managed their symptoms and reduced the impact that COPD had on their lives.

The study shows that both clinical outcomes and quality-of-life outcomes can be improved by using patients' perceptions of effective disease management in COPD.

References

GlaxoSmithKline Advanced Practitioner Award 2008

The successful use of non-medical prescribing of nutrition support in acute secondary care

P Austin, Z Leach, S Harding, M Stroud
Southampton University Hospitals NHS Trust

Background

The Health and Social Care Act 2001 provided a legal basis for non-medical prescribing in England by a number of professions, including pharmacists and nurses, and allows them to take full responsibility for their decisions. It was intended to support medical staff by reducing their workload and to improve access to medicines for patients.

This development promised to bridge traditional role barriers and, while there has been some support, it is understandable that there have also been some concerns, particularly from the medical profession, around whether this can be achieved safely and appropriately. It is important to demonstrate evidence that supports non-medical prescribing and to highlight practical requirements so that it is carefully introduced ensuring appropriate up-take and to prevent conflict.

Southampton University Hospitals NHS Trust has a reputation for innovative practice and four pharmacists completed the first available non-medical (supplementary) prescribing course with several more training or qualified since as supplementary and independent prescribers. In addition there are now numerous independent nurse prescribers within the trust.

The nutrition support team currently has three active non-medical prescribers, one pharmacist (qualified in January 2004 as a supplementary prescriber and later converted to independent prescriber in 2008) and two nurses (one qualified as an independent prescriber in November 2004 and the second in August 2008). With the initial intention of promoting non-medical prescribing in the field of nutritional support, it is in this setting that this review was carried out to see whether it has proved successful over the past few years.

This was to permit a validation of prescribing skill in practice as well as to consider the possible savings in physician time, which may prove significant in this context as an initial in-depth assessment and evaluation can be expected to take up to an hour and a subsequent review can typically take up to 20 minutes.

Objectives

There were two intended outcomes from this review:

- To demonstrate that non-medical prescribing can be routinely used for patient care allowing medical staff to spend more time with those patients that require their attention
- To demonstrate that non-medical prescribing can be routinely used successfully in an acute care setting

Methods

A specialist multidisciplinary nutrition support team works to meet the complex nutrition needs of adult patients within Southampton University Hospitals NHS Trust excluding the general and cardiothoracic intensive care units. This team primarily comprises a senior specialist pharmacist, two clinical nurse specialists and a specialist registrar and is directed by a medical consultant. The physicians lead the specialist ward rounds twice a week, the consultant on Tuesdays and the specialist registrar on Thursdays.

On the remaining three days there are routine non-medical prescribing ward rounds comprising the pharmacist and one nurse with access to one of the physicians should any complex decisions outside their competency be required.

All of the patients assessed and fed require intravenous feeding acutely, for example post-operatively, or are on long-term support at home and admitted with a complication requiring their feeding to be later acutely restarted in order to enable a timely discharge.

All prescriptions are written individually to meet the needs of a patient on a particular day and are therefore never simply a copy of the previous prescription and follow the National Institute for Health and Clinical Excellence (NICE) guidelines on prescribing adult nutrition support. This process also requires an in-depth clinical assessment and being able to anticipate possible changes accurately, for example to reported biochemistry. This requires strong knowledge of both the guidelines and of appropriate clinical nutrition assessment. Each prescription is written on a dedicated prescription chart and each of these is reviewed on one of the twice-weekly medical ward rounds. The discussion regarding the previous prescriptions considers how they fit with the NICE guidelines as well as the clinical situation of the patient.

This regular review ensures that a validation of the appropriateness of the non-medical prescribing is carried out despite the large number of prescriptions written.

Therefore, in order to meet the objectives of this review, all of the prescriptions written by the team since the introduction of non-medical prescribing in 2004 were summarised and split by prescribing profession. Additionally the average number of new referrals over this period was
calculated and added to the number of non-medical prescribing sessions to indicate potential cost savings to the trust.

**Results**
A total of 5,002 prescriptions were written by non-medical prescribers for a total of 5,580 treatment days following the introduction of non-medical prescribing in 2004 until the end of 2007. The proportion of total team prescribing that this represents is shown in Figure 1 (above). All of these prescriptions were considered appropriate during peer review by the team medics.

The mean number of annual new referrals over the period 2004 to 2007 was 290, equivalent to 83 sessions, and with the three non-medical ward rounds this is a total of 239 sessions per year of skilled physician time saved.

**Discussion and conclusion**
It is clear from the results that the trend is towards an increase in non-medical prescribing within the nutrition support team. The validation of the non-medical prescriptions by peer review suggests that it may be concluded that all of the non-medical prescribing was of a standard equivalent to a specialist medic.

This review has successfully shown that the release of medical time is possible by the routine use of non-medical prescribing in an acute setting. This is to the benefit of patients because the medics can then spend more time with those patients that have a greater need for their attention rather than having to spend their time prescribing. Having three non-medical prescribers allows for cover arrangements as well as other duties to be performed, which supports the local sustainability of this service.

There are also other benefits that have been highlighted, which include presenting a more professional image for the team and improved attention rather than having to spend their time prescribing. Having three non-medical prescribers allows for cover arrangements as well as other duties to be performed, which supports the local sustainability of this service.

There has been an increase in the number of referrals to the nutrition support team. This is due to the introduction of non-medical prescribing, which has allowed the medical team to focus on more complex cases. The validation of these prescriptions by peer review has ensured that all of the non-medical prescribing was of a standard equivalent to a specialist medic.

**Discussion and conclusion**
It is clear from the results that the trend is towards an increase in non-medical prescribing within the nutrition support team. The validation of the non-medical prescriptions by peer review suggests that it may be concluded that all of the non-medical prescribing was of a standard equivalent to a specialist medic.

This review has successfully shown that the release of medical time is possible by the routine use of non-medical prescribing in an acute setting. This is to the benefit of patients because the medics can then spend more time with those patients that have a greater need for their attention rather than having to spend their time prescribing. Having three non-medical prescribers allows for cover arrangements as well as other duties to be performed, which supports the local sustainability of this service.

There are also other benefits that have been highlighted, which include presenting a more professional image for the team and improved attention rather than having to spend their time prescribing. Having three non-medical prescribers allows for cover arrangements as well as other duties to be performed, which supports the local sustainability of this service.

**Discussion and conclusion**
It is clear from the results that the trend is towards an increase in non-medical prescribing within the nutrition support team. The validation of the non-medical prescriptions by peer review suggests that it may be concluded that all of the non-medical prescribing was of a standard equivalent to a specialist medic.

This review has successfully shown that the release of medical time is possible by the routine use of non-medical prescribing in an acute setting. This is to the benefit of patients because the medics can then spend more time with those patients that have a greater need for their attention rather than having to spend their time prescribing. Having three non-medical prescribers allows for cover arrangements as well as other duties to be performed, which supports the local sustainability of this service.

There are also other benefits that have been highlighted, which include presenting a more professional image for the team and improved attention rather than having to spend their time prescribing. Having three non-medical prescribers allows for cover arrangements as well as other duties to be performed, which supports the local sustainability of this service.
chronic pain clinic. Reasons for referring patients to the pharmacist’s clinic were: patients on strong opioid medication, with known concordance issues or complex medication regimens.

- “…to change from one opioid to another so that the change can be smooth with least problems experienced by the patient”
- “…review rational use of complex medications (with a view to identifying potential interactions)”

Colleagues thought the pharmacist added value to patients and staff: combining knowledge of medication with other aspects of persistent pain management was a common theme. Additional time to spend with patients discussing their medication was also viewed as a benefit.

- “…combine specialist knowledge of medications with understanding the biopsychosocial aspect of pain and its management”
- “…the pharmacist adds great value to my own practice in terms of support and education”

Aspects of the pharmacist’s contribution that colleagues considered unique included: education on medication; supporting evidence-based practice; knowledge of formulation and pharmacology.

- “Provide critical analysis of medication eg, questioning of information from pharmaceutical companies”
- “…provides a unique consultation where patients’ medication is the focus and they can feel free to discuss their difficulties with taking the medication and its side effects…”

Colleagues’ view of the pharmacist’s role had changed. The main view was that the pharmacist offered more than medication reviews for patients.

- “I have been surprised by the pharmacist handling much more challenging stuff than I had expected to be the case. The pharmacist now case manages patients with a wide variety of needs and not just medication issues”

Patients were receptive to the offer of talking with the pharmacist.

- “Yes and often actually request to see a pharmacist. Many patients think the pharmacist is more important than a doctor when discussing medication issues”
- “Proof comes in the time given to the local chronic pain support group. Group and individual sessions are highly valued”

All colleagues thought that the pharmacist’s service should continue within the clinic.

- “The pharmacist has been an outstandingly ‘good buy’”
- “The pharmacist is a priceless asset to the service for both patients and health care team”

Suggestions for change related to areas that the pharmacist could be involved in rather than specific changes to current service provision.

- “…additional training in motivational interviewing and managing behavioural change, an important aspect of pain management”

Discussion and conclusion

Responses were overwhelmingly positive. There were no negative comments, although this might have differed with anonymous replies. The next stage of this service evaluation will consider GP acceptance of pharmacist recommendations and patient-oriented outcomes such as pain and depression scores.

Before having a pharmacist, medication was managed by consultants for initiation and nurse-led appointments for follow-up. The pharmacist-led clinic covers initiation, monitoring and alterations to regimens where required — a cost-effective use of the available skill mix and relieving pressure on doctor’s clinic time. Persistent pain management is a complex field and not an area commonly covered in pharmacy teaching at any level. Patients present with multifarious histories, troubled social circumstances and years of investigations for their pain. This leads to a less straightforward patient group then might first appear. The skills that pain professionals require for consultations are different to those for everyday inpatient work on acute hospital wards. Staff at the RSH clinic are encouraged to develop their expertise by various means: utilising specialist training including master’s degrees in pain management; attending locally organised training and importantly sharing experiences with colleagues.

Analysis of this feedback is encouraging for pharmacists interested in specialising in pain management. It was acknowledged that the pharmacist could make a unique contribution to the pain clinic. Combining education and critical analysis of medications, with specialist counselling, is seen as an asset by colleagues and is standard practice for many pharmacists. Preparedness to adopt new methods of working in order to achieve specialist practitioner status and integrate into established teams is essential. In this case, by doing so, the pharmacist met and exceeded the expectations of colleagues.

References


Lilly Critical Care Award 2008

Improvement in glycaemic control and outcome corresponding to intensive insulin therapy protocol development

R Shulman**, S J Finney*, S M Ali*, N Shah†, R Greene†, P Glynne*

*Pharmacy Department, Intensive Care Department, University College Hospital; †Intensive Care Department, Royal Brompton Hospital; ‡School of Pharmacy, †Pharmacy Department, King’s University

Introduction

Intensive insulin therapy (IIT) has been shown to reduce mortality and morbidity in longer-stay critically ill patients.1 The benefits have been shown while aiming for tight glycaemic control (TGC; blood glucose [BG] 4.4–6.1mmol/L). However, this has only been demonstrated at a single site, while two multi-centre studies2,3 have been prematurely terminated mainly due to hypoglycaemia. Other difficulties with IIT include efficacy of glycaemic control. We previously described how our first protocol did not deliver glycaemic control.4 Here we describe how IIT can be improved by protocol simplification and removal of glucose supplementation.

Objective

To compare an updated IIT protocol with a previous IIT protocol and a control group, in terms of the degree of TGC achieved, monitoring frequency, hypoglycaemic events and mortality.

Method

At our general adult 22-bed ICU, a clinical information system established at each bedspace guided staff through the IIT algorithms. Three groups
Table 1: Study outcome

<table>
<thead>
<tr>
<th></th>
<th>IIT2 (n = 51)</th>
<th>IIT1 (n = 50)</th>
<th>CIT (n = 50)</th>
<th>P-value comparing three groups (P-value comparing IIT 1 and 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients experiencing severe hypoglycaemia</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>0.93 (0.76)</td>
</tr>
<tr>
<td>Mean number of glucose readings/day (SD)</td>
<td>11.5 (3.3)</td>
<td>14.5 (5.7)</td>
<td>11.6 (3.3)</td>
<td>&lt;0.001&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Number surviving at 28 days (%)</td>
<td>38 (74.5%)</td>
<td>34 (68%)</td>
<td>24 (48%)</td>
<td>0.02&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> = chi squared test; <sup>b</sup> = one way analysis of variance; SD = standard deviation

Figure 1: Stacked bar chart of blood glucose measurements represented in terms of percentage time (%) in predefined glycaemic ranges

Table 1: Study outcome

<table>
<thead>
<tr>
<th></th>
<th>IIT2</th>
<th>IIT1</th>
<th>CIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients experiencing severe hypoglycaemia</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Mean number of glucose readings/day (SD)</td>
<td>11.5 (3.3)</td>
<td>14.5 (5.7)</td>
<td>11.6 (3.3)</td>
</tr>
<tr>
<td>Number surviving at 28 days (%)</td>
<td>38 (74.5%)</td>
<td>34 (68%)</td>
<td>24 (48%)</td>
</tr>
</tbody>
</table>

Despite the large single-centre studies showing the benefits of IIT, there are large variations in practice, and this has proved to be a contentious area of ICU practice. The main concerns are related to the risk of hypoglycaemia, the additional workload necessary and the complex protocols. We addressed these issues by comparing an updated IIT protocol with our original protocol and previous conventional practice. IIT protocol optimisation was associated with increased glycaemic control and improved 28-day survival. The better optimised IIT2 protocol provided tighter control than either the IIT1 or CIT protocol without increased sampling or incidence of hypoglycaemia. The clinical effectiveness of this IIT algorithm appeared to be improved by simplifying the protocol to meet the needs of the critical care unit. A limitation of this work is that it was a retrospective cohort study. The use of historical controls does not allow the presumption of a causal effect of the associations described. Finally, it was not possible to record the insulin doses.

References


Novartis Antimicrobial Management Award 2008

Modelling the impact of antibiotic use and infection control practices on the incidence of hospital-acquired methicillin-resistant Staphylococcus aureus: a time-series analysis

M A Aldeyab<sup>1</sup>, D L Monnet<sup>2</sup>, J M López-Lozano<sup>1</sup>, C M Hughes<sup>1</sup>, M G Scott<sup>3</sup>, M P Kearney<sup>3</sup>, F A Magee<sup>4</sup>, J C McClain<sup>4</sup>

<sup>1</sup>Clinical and Practice Research Group, School of Pharmacy, Queen’s University Belfast, Northern Ireland; <sup>2</sup>National Center for Antimicrobials and Infection Control, Statens Serum Institut, Copenhagen, Denmark; <sup>3</sup>Investigation Unit, Hospital Vega Baja, Orihuela, Alicante, Spain; <sup>4</sup>United Hospitals Trust, Antrim, Northern Ireland

This paper has already been published elsewhere.1

Reference

Impact of a pharmacist-led epilepsy clinic on adherence to therapy and quality of life

A Fogg1, E Staufenberg1, D Bhattacharya2, I Small1
1NHs Norfolk, Norwich; 2School of Chemical Sciences and Pharmacy, University of East Anglia, Norwich; 3School of Medicine, Health, Policy and Practice, University of East Anglia, Norwich

Introduction

Epilepsy is the most common chronic neurological condition, largely managed with antiepileptic drugs (AEDs), the primary goal being a seizure free patient. This is, however, not achieved for all patients, with medication non-adherence being commonly cited as a reason for poor treatment outcome with AEDs. It has been reported that between 30% and 50% of patients deviate from their prescribed regimen to the extent that it interferes with optimal treatment. Furthermore, between 31% and 33% of hospital admissions due to uncontrolled seizures have been found to be associated with low or undetectable blood levels of AEDs arising from non-adherence. An improvement in medication adherence has been demonstrated by pharmacist-provided counselling regarding prescribed treatment, medical condition and benefits of adherence for long-term medications. However, the impact of an epilepsy-specific medication review clinic on adherence and quality of life has not been reported.

Seizure frequency is characteristically used as a primary outcome measure for most novel interventions for epilepsy management; however, research has demonstrated that patient perceptions of treatment outcome often include parameters additional to seizure frequency. The use of an epilepsy-specific self-reported measure of quality of life therefore provides a more comprehensive measure of the effect of a novel intervention designed to improve general mental and physical well-being of patients with a diagnosis of epilepsy. With a view to expanding the role of the pharmacist, this study was designed to determine the effect of a pharmacist-led epilepsy clinic on patient adherence to prescribed AEDs and quality of life.

Objectives

The objectives were to describe the level of self-reported quality of life, the magnitude of self-reported non-adherence to AEDs, and the change in self-reported quality of life and non-adherence post pharmacist led epilepsy clinic.

Method

Post research governance and ethical committee approval, all patients registered with one of five medical practices within Norwich with a diagnosis of epilepsy, over the age of 18 years and prescribed AEDs, were identified. Patients with substance misuse problems and/or no contact telephone number were excluded. All eligible patients were invited by telephone to attend a pharmacist-led epilepsy clinic. 117 patients were required in order to detect a 15% change in adherence from 70% to 85% with a power of 80% and 5% significance. Medication errors occur most commonly on transfer between care settings and thus the pharmacist is ideally positioned to confirm drug histories as soon as possible after admission and a time limit of (set at 90% to reflect restricted GP opening hours at weekends), and to measurement of AED levels as an assessment of adherence if this study is to be repeated. It is therefore necessary for this intervention to be assessed in a larger number of patients using the randomised trial format and possibly including measurement of AED levels, to identify whether a practice-based pharmacist-led epilepsy clinic improves patient quality of life and adherence to AEDs.

Results

171 patients met the inclusion criteria, of whom 74 (43.3%) consented to attend clinic. A further 11 (14.9%) withdrew prior to attendance while 13 did not complete the follow-up questionnaire. 50 patients attended clinic and completed the two-month follow-up questionnaire. The mean (CD95) age of participants was 54 [2-4] years and 47% were male. A significant improvement (P=0.037, paired t-test) in QOLIE10 score was demonstrated with a mean (CD95) change in score of 1.8 [0.12-3.5] from 26.54 at baseline to 24.74 post intervention. Median (IQ) MARS score was 24 (24, 25) at baseline, with no significant change post intervention. A score of 25 indicates perfect self-reported adherence.

Discussion

Accepting the limitations of a before and after study and thus inability to identify causal links, a significant improvement in patient-reported quality of life in epilepsy was demonstrated post clinic. The absence of a significant change in self-reported adherence contradicts previous reports of similar pharmacist interventions for other therapeutic areas. However, it was to be expected given that the study was underpowered, as the initial target of 117 patients was not achieved due to fewer than expected patients meeting the inclusion criteria and a low consent rate.

Furthermore, self-reported adherence is prone to overestimates of adherence due to self-presentation bias. This may be overcome by the measurement of AED levels as an assessment of adherence if this study is to be repeated. It is therefore necessary for this intervention to be assessed in a larger number of patients using the randomised trial format and possibly including measurement of AED levels, to identify whether a practice-based pharmacist-led epilepsy clinic improves patient quality of life and adherence to AEDs.

References


Hameln Oral Communication Winner 2008

A Fogg, E Staufenberg, D Bhattacharya, I Small

Hameln Poster Winner 2008 (1)

Medicines reconciliation by pharmacy staff at weekends on the Acute Medical Unit (AMU) in the Chelsea & Westminster Hospital

S Scarle
Chelsea and Westminster Hospital NHS Foundation Trust, London

Introduction

Medication errors occur most commonly on transfer between care settings and at the time of admission. These errors can lead to considerable patient harm. In a recent joint publication with the NPSA, NICE reported that pharmacist involvement in medicines reconciliation resulted in fewer discrepancies between hospital and home medications compared with nurse or doctor-conducted histories. It is therefore recommended that pharmacists confirm drug histories as soon as possible after admission and a time limit of 24 hours has been suggested as a reasonable target. At one London teaching hospital, a weekend ward-based pharmacy service has been recently initiated, in addition to weekday hours, to meet the increasing workload of the AMU. This audit was undertaken to assess the impact of the weekend pharmacy service with regard to the timely reconciliation of patients’ medications.

Objectives

The objectives were to assess adherence to the locally agreed pharmacy standard that 90% of drug histories should be confirmed by a pharmacist/pharmacy technician within 24 hours of a patient’s admission (set at 90% to reflect restricted GP opening hours at weekends), and to
investigate reasons for non-adherence by evaluating the methods of medicines reconciliation.

Method
Data were collected at weekends over a two-month period (16 days) from November 2007 to January 2008. All pharmacists scheduled to work on the AMU during this period were briefed and asked to record the time and date that each drug history was confirmed, along with the method used e.g. GP, ‘patients’ own drugs’ (PODs). Patients admitted onto the AMU between midnight on Friday and midnight on Sunday were identified via the admissions book on the ward and the hospital’s electronic patient records system was used to identify the time of patient admission. A standard data collection tool was used to record the required information, taken directly from drug charts, which were located after each weekend. The time difference between admission to the AMU and completion of the drug history was calculated and data were analysed using simple descriptive statistics.

Results
During the period of this study there were 139 patient admissions, however, 130 drug charts were located. A further five patients were discharged within 12 hours of admission onto the AMU and it was felt that these patients should be excluded from the results as it is not always practical or necessary to confirm a drug history within such a short time frame. For the remaining 125 patients, a drug history was confirmed within 24 hours for 97 (78%) patients.

The methods used to obtain the drug histories for the 28 patients (22%) confirmed outside the 24-hour window were variable (Table 1, above). The reasons that a drug history was not confirmed in three patients are unknown and the remaining two patients could not speak English. Five patients (Table 1) were able to recall their own drug history and/or bring in PODs and therefore the drug histories could have potentially been confirmed within 24 hours. The reasons that they were not are unknown. This similarly applies to the patient whose drug history was confirmed using a recent DSUM, but confirmation occurred greater than 24 hours after admission.

Discussion
Adherence to the standard occurred for only 78% of patients during this audit and therefore the proposed target of 90% was not achieved. One reason for this is that the majority of patients that fell outside the standard could not recall details of their medications and contact with their GP surgery was required for confirmation. As few GP surgeries are currently open at weekends, a delay in medicines reconciliation is likely. This is something that may change in the future with the development of the central health information spine, which will make it easier to share patient information and will facilitate the drug history-taking process. However, this is not an immediate solution and it is clear that in order to improve adherence to the standard and comply with NICE/NPSA guidance the focus needs to be on other methods of medicines reconciliation.

Increased utilisation of information from community pharmacies may aid the process and discharge summaries and PODs can also act as a prompt for patients. Patients are encouraged to bring PODs into hospital but some may be discouraged by previous experiences where their medications were lost during transfer or inadvertently discarded. Effective transfer of PODs may therefore be an area to improve to facilitate drug history taking. For patients who do not speak English, a translator service at weekends would be helpful to ensure correct documentation of medication. This audit suggests that timely medicines reconciliation at weekends is possible for the majority of patients but identifies areas to target in order to achieve both the locally agreed standard and the optimum of 100%.

Table 1: Methods of medicine reconciliation for patients where the drug history was completed more than 24 hours after admission (n=28)

<table>
<thead>
<tr>
<th>Method of obtaining drug histories</th>
<th>Drug history not confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP surgery</td>
<td>Patient/POD</td>
</tr>
<tr>
<td>Relative DSUM*</td>
<td>16</td>
</tr>
<tr>
<td>% of patients</td>
<td>60</td>
</tr>
</tbody>
</table>

* DSUM = Electronic discharge summary from previous admission (used only to facilitate drug histories if dated within three months of current admission)

References

Hameln Poster Winner 2008 (2)

Use of extended thromboprophylaxis in high risk surgical patients

R Patel, K Foster, N Husain
Pharmacy Department, Kings College London; Pharmacy Department, Guy’s and St Thomas’ NHS Foundation Trust

Introduction
Venous thromboembolism (VTE), which encompasses deep vein thrombosis (DVT) and pulmonary embolism (PE), is the largest cause of preventable death in hospital.1 In May 2007, Guy’s and St Thomas’ NHS Foundation Trust (GSTFT) implemented a prescribing guideline for adult surgical inpatients. The guideline recommends extended thromboprophylaxis (28-day course of enoxaparin 40mg + graduated elastic compression stockings [GECS]) for very-high-risk patients undergoing total hip replacement (THR), hip fracture surgery (HFS), major gynaecological surgery for cancer or major general surgery for cancer.

Objective
To determine the percentage of patients discharged on extended prophylaxis whose discharge prescription is correct (drug, dose, duration), who are able to self-administer enoxaparin, whose information needs are fully met prior to discharge, who are fully compliant, whose platelets are monitored five days post discharge, and who dispose of sharps safely.

Method
All patients discharged on extended thromboprophylaxis over a two-month period were identified by asking surgical ward pharmacists to refer patients, examining records of dispensed discharge prescriptions, and reviewing a report on all issues of enoxaparin from the pharmacy computer system.

Data on type of surgery, date of surgery and extended prophylaxis prescribed (drug, dose, duration) were collected from the discharge prescription. Patients were then contacted and asked to complete a questionnaire via telephone interview. The questionnaire covered: whether self-administration of enoxaparin had been possible; quality of teaching provided by nursing staff during admission; provision of GECS, compliance; knowledge of adverse effects; platelet monitoring post discharge; and disposal of sharps.

Results
Fifty-six patients were identified and 42 were included in the audit (six refused to participate, eight could not be contacted). Twenty-four patients had undergone major gynaecological surgery for cancer; eighteen patients had undergone major general surgery for cancer. All patients were prescribed the correct dose of enoxaparin and the correct quantity to enable completion of a 28-day course. GECS were not prescribed; 24% of patients were supplied GECS at discharge and a further 12% kept the GECS they had worn during their admission. 83% of patients were able to self-administer enoxaparin, 17% were administered enoxaparin by a friend, relative or district nurse. All patients able to self-administer were taught how to do so prior to discharge. A variety of methods were used (Figure 1, p68). All patients thought that the quality of teaching provided was either “excellent” or “good”. 80% felt that no improvements needed to be made, 20% would have liked to have been taught earlier in their hospital stay. 55% injected into their thigh, 29% into their abdomen and 17% into their upper arm. All patients rotated the exact site of injection. 76% of patients did not miss any doses of, 19% missed one dose, and 5% missed more than one dose. Reasons for missed doses included syringe
breakage (three patients), forgetfulness (three patients), friend/relative not available to administer (three patients), intentionally stopped therapy (one patient, reason unknown). Of the 15 patients discharged with GECS, 13 wore them every day.

29% of patients received information about potential side effects of enoxaparin: 38% experienced side effects (15 patients reported bruising at the injection site, one patient reported bleeding). Only 7% of patients were instructed to visit their GP five days post discharge in order to have their platelet count checked.

83% of patients were provided with a sharps bin and 64% were advised how to dispose of it. All patients given a sharps bin disposed of it safely (via local pharmacy, GP practice, hospital, district nurse), except one patient who disposed of it in their household waste.

Discussion
Patients prescribed enoxaparin on discharge for extended prophylaxis were prescribed it correctly. GECS and sharps bins should also be prescribed on the discharge letter in order to ensure that they are always supplied on discharge.

At GSTFT this could be achieved by including a standard extended prophylaxis prescription in the electronic discharge letter program.

Most patients were able to self-administer enoxaparin and few reported missed doses, indicating that use post-discharge is achievable. Patients considered the quality of teaching provided by nursing staff to be good, however standardisation is required to ensure that all patients are informed about the correct site of administration (abdomen or thigh). Teaching should begin as soon as possible after surgery.

A patient information leaflet should be developed, informing patients about potential side effects, action to take if these occur, need for GP to check platelet count five days post discharge and how to dispose of sharps bins.

References

Method
During the first week in October 2007, a one-week "Healthy Heart" campaign was conducted in a city-centre pharmacy in Aberdeen. A 15-item, customer questionnaire was developed, focusing on heart disease and lifestyle. Pharmacy staff were trained to conduct the questionnaire with customers using a standard operating procedure. A method of recording non-participation was also developed. Participating customers received written information (from NHS Grampian Health Promotions) and verbal lifestyle advice. A list of NHS patient-based web resources on risk factors for coronary heart disease was also made available to customers. Local general practices were informed about the campaign by letter. A poster advertising the campaign was displayed in the pharmacy branch and in local surgeries.

The objectives of this study were to inform the target group about the benefits of a healthy lifestyle, to ascertain the numbers of participants that currently have risk factors for coronary heart disease, to quantify the number of participants that already have some form of cardiovascular disease and to signpost individuals to appropriate services within Grampian.

The criteria outlined in SIGN 97 “Risk estimation and the prevention of cardiovascular disease” were utilised when deciding on the factors that would warrant a referral to a GP practice. Customers would only be encouraged to visit their surgery if they were >40 years, had multiple lifestyle risk factors and had not seen a GP for over 12 months.

Results
In total, 99 customers participated. Of these, 20 (~20%) reported established heart disease, and 41% had familial heart disease. While all participants with established disease reported having a healthy diet, 65% and 25% consumed only 1–3 portions and 4–5 portions of fruit or vegetables daily, respectively. Approximately 2% reported consuming six or more portions of fruit and vegetables a day. Twenty-eight participants had a normal BMI 30 were overweight, 38 were obese; and four were morbidly obese. Thirty-six participants were smokers, of whom 22 smoked 10–20 cigarettes/day, eight smoked <10/day and six smoked >20/day. Most participants (n=99) drank alcohol, 15 of whom drank more than the weekly recommended allowance. Forty-eight participants reported taking regular physical activity less than twice a week.

Discussion
A wide range of lifestyle factors were recorded, along with participant personal and family history of heart disease. There have been many published studies and some systematic reviews carried out on the effects of lifestyle on morbidity and mortality. Missing data was a limitation of this study. The record of non-participants was incomplete and inaccurate due to non-completion by staff during busy periods. Facilities were established in the consultation room to weigh, and measure the height and waist circumference of, customers for whom any of these factors were unknown. Approximately 30 customers omitted their waist circumference measurement. This may be partly attributed to staff being unable to attend each customer during busier periods.

Many customers reported modifiable risk factors for CHD Community pharmacy is ideally placed to help address these factors. Smoking cessation advice and treatment is already an established community pharmacy service within Grampian. Additional services that should be considered are brief interventions (eg, motivational interviewing) for alcohol consumption and healthy weight management. Obesity, in particular, has a major impact on physical, social and emotional well-being. Bandolier reported “Better health through better lifestyle”, combining all the different aspects of healthy living, makes a substantial difference to health outcomes by reducing the chance of heart attack or stroke by about 80% over fourteen years. A pharmacy-based healthy weight management service might be developed using the results of this study.

References
Impact of a pharmacist-led epilepsy clinic on adherence to therapy and quality of life

Fogg A*, Staufenberg E‡, Bhattacharya D§, Small I
NHS Norfolk, Norwich; *School of chemical Sciences and Pharmacy, University of East Anglia, Norwich; ‡School of Medicine, Health, Policy and Practice, University of East Anglia, Norwich

Introduction
Epilepsy is the most common chronic neurological condition, largely managed with antiepileptic drugs (AEDs), the primary goal being a seizure free patient. This is, however, not achieved for all patients, with medication non-adherence being commonly cited as a reason for poor treatment outcome with AEDs. It has been reported that between 30 and 50% of patients deviate from their prescribed regimen to the extent that it interferes with optimal treatment. Furthermore, between 31% and 33% of hospital admissions due to uncontrolled seizures have been found to be associated with low or undetectable blood levels of AED arising from non-adherence.

An improvement in medication adherence has been demonstrated by pharmacist-provided counselling regarding prescribed treatment, medical condition and benefits of adherence for long term medications. However, the impact of an epilepsy specific medication review clinic on adherence and quality of life has not been reported.

Seizure frequency is characteristically used as a primary outcome measure for most novel interventions for epilepsy management; however, research has demonstrated that patient perceptions of treatment outcome often include parameters additional to seizure frequency. The use of an epilepsy-specific self-reported measure of quality of life therefore provides a more comprehensive measure of the effect of a novel intervention designed to improve general mental and physical well being of patients with a diagnosis of epilepsy. With a view to expanding the role of the pharmacist, this study was designed to determine the effect of a pharmacist led epilepsy clinic on patient adherence to prescribed AEDs and quality of life.

Objectives
- Describe the level of self-reported quality of life
- Describe the magnitude of self-reported non-adherence to AEDs
- Describe the change in self-reported quality of life and non-adherence post pharmacist led epilepsy clinic

Method
Post research governance and ethical committee approval, all patients registered with one of five medical practices within Norwich with a diagnosis of epilepsy, over the age of 18 years and prescribed AEDs were identified. Patients with substance misuse problems and/or no contact telephone number were excluded. All eligible patients were invited by telephone to attend a pharmacist led epilepsy clinic. 117 patients were required in order to detect a 15% change in adherence from 70% to 85% with a power of 80% and 5% significance.

Baseline measurement of quality of life was assessed via the QOLIE10 which is a validated quality of life assessment tool specific for epilepsy and self-reported medication adherence was assessed via Medication Adherence Report Scale. Patients attending the clinic received a 30-minute consultation designed to provide them with an opportunity to ask questions related to their therapy and included a level 3 pharmacist medication review. The same data as baseline were collected 2 months post intervention.

Results
171 patients met the inclusion criteria, of whom 74 (43.3%) consented to attend clinic. A further 11 (14.9%) withdrew prior to attendance while 13 did not complete the follow-up questionnaire. 50 patients attended clinic and completed the 2 month follow-up questionnaire. The mean [CI95] age of participants was 54 [24, 84] years and 47% were male.

A significant improvement (p = 0.037, paired t test) in QOLIE10 score was demonstrated with a mean [CI95] change in score of 1.8 [0.12, 3.5] from 26.54 at baseline to 24.74 post intervention. Median (IQ) MARS score was 24(25, 25) at baseline and then demonstrated no significant change post intervention. A score of 25 indicates perfect self reported adherence.

Discussion
Accepting the limitations of a before and after study and thus inability to identify causal links, a significant improvement in patient reported quality of life in epilepsy was demonstrated post clinic. The absence of a significant change in self-reported adherence contradicts previous reports of similar pharmacist interventions for other therapeutic areas.

However, it was to be expected given that the study was underpowered, as the initial target of 117 patients was not achieved due to fewer than expected patients meeting the inclusion criteria and a low consent rate. Furthermore, self-reported adherence is prone to overestimates of adherence due to self presentation bias. This may be overcome by the measurement of AED levels as an assessment of adherence if this study is to be repeated. It is therefore necessary for this intervention to be assessed in a larger number of patients using the randomised trial format and possibly including measurement of AED levels, in order to identify whether a practice based pharmacist led epilepsy clinic improves patient quality of life and adherence to AEDs.

References
admitted for other reasons do not receive a review of their inhaler treatments. Anecdotally, it is felt that many of these patients use inappropriate inhaler treatments, putting them at risk of poor control and subsequent respiratory-related admissions. Incorrect inhalers may also be prescribed to hospital in-patients due to inaccurate drug histories taken at initial clerking.

A baseline audit to measure the appropriateness of inhalers and their devices for optimal COPD/asthma management has not previously been conducted in our Trust. This work assesses the quality of care in the provision of the right inhalers for our patients.

Objectives
1. To assess the proportion of patients on inappropriate inhalers for their clinical indication and step of therapy according to national guidelines\(^7\) [Standard 1-100% of inhalers prescribed are clinically appropriate for the clinical indication and step of therapy].
2. To assess the proportion of patients on inappropriate inhaler devices. [Standard 2-100% of inhaler devices prescribed for patients are suitable for patients allowing optimal delivery and benefit of drug].
3. To assess the proportion of inaccurate inhaler drug histories recorded by doctors at admission. [Standard 3-100% of inhaler drug histories taken by doctors are accurate].

Method
A referral system via pharmacists was used to identify all patients admitted to the Trust with inhalers during a 6-week period (29 November 2007 to 31 January 2008, excluding 24 December 2007 to 4 January 2008). Patients on critical care and paediatric wards were excluded. A team of 4 pharmacists and 2 respiratory nurses assessed the referred patients, analysed the drug histories and assessed the clinical appropriateness of the prescribed inhalers for the patients’ indications and the step of therapy according to national guidelines.\(^7\)

The patients’ inhaler techniques were also assessed using a standardised method developed locally with the respiratory nurses checking for inspiratory effort and dexterity. Interventions were made where necessary.

Results
Results were collected for 125 out of 135 referred patients, of which 87 (70%) had COPD, 34 (27%) had asthma and 4 (3%) were on inhalers for other reasons. 40% of referred patients were for non-COPD/asthma admissions who would normally not be referred to the respiratory nurses. One hundred and twelve (89.6%) patients assessed had one or more interventions made. A total of 170 interventions were made for 125 patients assessed (Table 1). Sixty-six (53%) patients had inappropriate inhalers for their clinical indication [47% of Standard 1 was achieved] and 64 (51%) patients had poor inhaler technique and required optimisation [49% of Standard 2 was achieved]. Thirty-one (24.8%) inhaler drug histories taken by doctors on admission were inaccurate [75.2% of Standard 3 was achieved]. Inaccuracies included omitting inhalers (20), prescribing incorrect drug (2), strength (7) and dose (4).

Table 1: Interventions made for 125 patients

<table>
<thead>
<tr>
<th>Type of intervention</th>
<th>Number of interventions</th>
<th>Total</th>
<th>COPD</th>
<th>Asthma</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Interventions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose optimisation</td>
<td>15</td>
<td>14</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Therapy optimisation</td>
<td>44</td>
<td>37</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Stopping inappropriate therapy</td>
<td>15</td>
<td>11</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Additional patient-focused education</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Technique Optimisation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-ordination problems</td>
<td>32</td>
<td>23</td>
<td>8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Counselling</td>
<td>31</td>
<td>18</td>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Inspiratory problems</td>
<td>17</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dexterity problems</td>
<td>8</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>170</td>
<td>127</td>
<td>39</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Discussion
Having achieved less than 50% for both Standards 1 and 2, this audit clearly indicates either a lack of knowledge and/or lack of review of patients’ COPD and asthma management. The latter is mainly attributed to the lack of time and resources available for patients admitted for non-respiratory admissions. The majority of these patients would not have received a respiratory review until they deteriorated or were hospitalised. This audit indicates poor quality of care given to patients on inhaler therapy prior to referrals and demonstrates the positive impact of the respiratory nurses and additional four pharmacists who contributed towards interventions that optimised inhaler therapy and patient care.

A quarter of inhaler drug histories taken by doctors were inaccurate, of which 60% resulted in the omission of inhalers that led to missed doses. The other inaccuracies resulted in patients taking the wrong drug, which showed poor clinical care. This therefore highlights the importance of having pharmacists to confirm drug histories as part of a high quality pharmaceutical service to patients, which is currently limited to working hours.

The study does have limitations. Several patients on inhalers were not referred to the team particularly the non-medical wards with high patient turnover and junior pharmacy staff who have limited time on wards. There were also ten referred patients where the team was unable to assess due to workload.

This audit highlights the need for improving quality of care in COPD/asthma patients. It also demonstrates the need for a referral system for non-COPD/non-asthma related admissions to ensure the right patients get the right inhalers. Furthermore, extending the pharmacists’ role of medicines reconciliation beyond traditional opening hours may reduce the occurrence of incorrect prescribing due to inaccurate drug histories at initial clerking. The above recommendations would therefore ensure appropriate inhaler therapy to achieve optimal patient outcomes across the Trust. A re-audit will be undertaken once recommendations have been agreed and implemented.

References

3 Developing a documentation system for continuity of pharmaceutical care across the primary/secondary interface in elderly patients

Stewart J, Todd G, Kinnear M

NHS Lothian Pharmacy Service, Roodlands Hospital, Haddington and Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow.

Introduction
There is a need to achieve continuity of care across the primary-secondary care interface\(^3\). Medicine related problems are common as patients transfer between these sectors of care and improved communication of medicines related information has the potential to minimise such problems\(^3\). New responsibilities for community pharmacists provide the opportunity for pharmacists to work collaboratively across the interface to improve exchange of medicines related information.
Objective
To design and evaluate a documentation system to facilitate the transfer of pharmaceutical care across the primary/secondary care interface to provide continuity of care for elderly patients.

Method
This was a prospective, cohort study using data from 43 patients admitted to a Care of the Elderly Unit in a rural community hospital over a 5 month period. Patient medication profiles and pharmaceutical care plans were completed by the clinical pharmacist in accordance with normal pharmacy practice. Patients who used one community pharmacy agreed to the transfer of information, on the proposed transfer form, between the hospital and community pharmacists and GP. Community pharmacists were contacted to provide information from their medication records which was added to the hospital pharmaceutical care plan and issues identified or resolved using this information were recorded and analysed.

A pharmaceutical care transfer (PCT) form was designed, drawing from existing documentation. Feedback was obtained from local hospital and community pharmacists. The document was field-tested on discharge for 43 patients. The document was sent by secure fax to the community pharmacy and the patient’s GP. The PCT was retrieved from community pharmacists approximately 3 months post discharge and the care issues investigated to determine the type resolved, on-going or reasons for no action. A postal questionnaire assessing the value of the PCT to the community pharmacist in terms of aiding the provision of pharmaceutical care was sent. Confirmation that research ethics committee approval was not required for this study was obtained.

Results
Of 43 patients, 17 (40%) were male. The mean(SD) age was 77.3 (SD) and mean (SD) duration of stay was 15.8 days (SD). The mean (SD) number of pre-existing conditions was 4.5 (SD 2.0) and the mean (SD) number of medications on admission was 7.5 (SD 5.2).

On admission, 181 care issues were identified [median 3 (IQR 2, 6) per patient] in 43 patients. Using data obtained from community pharmacists for 41 patients helped identify 61 (34%) and resolve 8 (4%). Of those issues identified from community pharmacy data 48 (79%) were actual or possible drug omissions.

On discharge, 223 care issues were transferred [median 5(IQR 2, 8) per patient]. Most (85%) were due to medication changes. PCT forms were returned for 14 (33%) patients. Another 14 patients were followed up by examination of community pharmacy medication records. Of 97 recommended medication changes 91% could be confirmed but 9% were not executed, no reasons were provided. Only 20% of the remaining issues had further documentation confirming follow-up. One asthma review had been performed by the GP, it is unknown how many other issues were followed up by the GP.

Ten out of 17 (59%) questionnaires were returned. All agreed the information on the PCT was useful as an aid to providing pharmaceutical care. The degree of usefulness was rated individually for 14 patients: “very useful” 7 (50%), “slight benefit” 6 (43%), “extremely useful” 1 (7%), “no benefit” 0, “potential use” 0. Of particular value was information regarding medicine changes, including temporary changes, adverse drug reactions or required monitoring.

Discussion
Information from community pharmacists confirmed potential drug omissions or errors made when patients are admitted to hospital. The documentation system developed was perceived to be useful for ensuring medication changes were effected and encouraging appropriate monitoring. However further work is required to encourage community pharmacists to document their provision of pharmaceutical care.

References

Table 1: Self Administration of Medicines (SAM) – Quick Step Check

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is the patient likely to take their own medicine on discharge?</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Does the patient want to take part in the SAM scheme?</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Will the patient be on your ward for more than 24 hours?</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

4 Evaluating the impact of a potential self administration of medicines service on medical, surgical and elderly wards

C Parkes, Department of Pharmacy, Northumbria Healthcare NHS Foundation Trust

Introduction
Self administration of medicines (SAM) is a programme where patients have responsibility to manage and administer their own medicines whilst in hospital. This is thought to have many benefits such as improving patient knowledge and compliance with their medication and increasing patient empowerment and rehabilitation. Medication timing can be more accurate and medicines management problems can be identified before discharge, making this a speedier process. There is a new trust policy for self administration of medicines which states that practitioners should assess all patients on the ward with the ‘SAM quick step check’ (table 1) and the patients meeting these criteria should be fully assessed to determine their level of SAM. Level 1 is when the practitioner educates the patient whilst administering the medicines, level 2 is when the patient takes their medicines under supervision but the practitioner retains responsibility for storage and security and level 3 is when the patient administers their medicines themselves and is also responsible for storage and security.

Objectives
To assess the potential impact the new trust policy will have on medical, surgical and elderly wards by assessing the number of patients suitable for self administration, and to estimate the time taken for the assessments.

Methods
Data was collected from three medical, three surgical and three elderly care wards at two hospital sites. Patients were initially assessed using the
quick step check in Table 1, and then those patients meeting these criteria were further assessed using the detailed assessment from the policy. It was explained to the patients that this was only a potential service.

**Results**

Of 156 patients assessed in total, 53 (34%) were likely to be self-administering on discharge, and 14 patients (9%) would choose to take part in the scheme, and were suitable for the full assessment. Of these one patient was at level 1, six patients were at level 2 and seven patients were assessed to be at level 3.

Of the 63 patients assessed on medical wards, 22 patients (35%) were likely to self-administer their medicine on discharge, and seven patients (11%) wanted to take part in a SAM scheme (table 2). This means that of those suitable for the full assessment, approximately two in every three patients opted not to take part in SAM. Those that opted in to the scheme were then assessed using the full assessment and five patients (8%) were at level 2, and two patients (3%) were able to self-administer safely at level 3.

**Table 2: Number of patients suitable for SAM using the ‘quick step check’ and levels determined following full assessment**

<table>
<thead>
<tr>
<th>Level</th>
<th>Medicine</th>
<th>Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elderly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of patients</td>
<td>63 (100%)</td>
<td>42 (100%)</td>
</tr>
<tr>
<td>Number likely to self administer on discharge</td>
<td>22 (35%)</td>
<td>23 (55%)</td>
</tr>
<tr>
<td>Number of these likely to participate in SAM</td>
<td>7 (11%)</td>
<td>5 (12%)</td>
</tr>
<tr>
<td>Level 1</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Level 2</td>
<td>5 (8%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Level 3</td>
<td>2 (3%)</td>
<td>5 (12%)</td>
</tr>
</tbody>
</table>

On the surgical wards 42 patients were assessed and 23 patients (55%) were likely to self-administer on discharge, but only five patients (12%) were wishing to participate, meaning that almost four patients out of every five that were likely to take their own medicines on discharge opted not to take part in SAM. On the surgical wards all five patients were found to be suitable for self-administration at level 3.

Of the 51 patients assessed on the elderly wards only eight patients (16%) managed their own medicines at home, and two patients (4%) in total wished to participate, the remaining 12% opting out. Those wishing to participate were assessed and one patient was at level 1 and one patient was at level 2.

It took on average ten to thirty seconds to complete the ‘quick step check’ per patient, and approximately three to six minutes to complete each full assessment.

**Discussion**

The implementation of a self-administration of medicines service would seem to be feasible, due to the relatively low numbers of patients deemed to be suitable to participate in the scheme. The largest potential impact of the service was on the surgical wards where the largest number of patients were suitable to self-administer, and who were all at level 3. The smallest proportion of patients able to self-administer was on the elderly wards, with no patients able to safely administer at level 3. A high proportion of patients chose to opt out of SAM due to reasons such as their medication was changing frequently, they preferred the current system with the nurses administering, and some worried about how to manage after their surgery. Further explanation of the benefits of SAM along with reassurance to the patient may encourage participation; however this was difficult due to the hypothetical situation in which this was carried out.

The ‘quick step check’ was swift and easy to complete, and it was an effective way of quickly ruling out those patients unsuitable for self-administration. It would therefore be a feasible scheme to put into practice. With the many potential benefits to SAM and the feasibility of the assessment the scheme should be implemented, and could have a potential place both on surgical wards where it would be ideal for elective admissions and on longer stay medical and elderly wards where patients could work up the levels, increasing their compliance before discharge. We need to increase the awareness of self administration of medicines and the new policy amongst both staff and patients, and once implemented, continued evaluation of the scheme is necessary to ensure it remains fit for purpose.

**References**

maximum of 20 minutes per patient. Both investigators reviewed the first 20 sets of case notes. Details of ADE triggers identified and the reasons for them were recorded on the data collection form. Where the trigger was felt to be indicative of an ADE, the severity of the ADE was estimated using the NCC MERP index by the investigators.

Results
Notes of 150 patients were requested. Seventy four sets of case notes were available of which 50 were included in the audit. The remaining 24 sets of case notes were excluded.

The sample included 24 females and 26 males with an average age of 52 years (range 14–86, median 45). Patients from all clinical specialties were represented: Cardiac (5), Critical Care (1), Liver (4), Medicine (7), Neurosciences (5), Paediatrics (2), Private Patients (2), Renal (1), Surgery (14), Women’s Services (9).

A total of 56 triggers were identified in 35 patients. Eight patients were considered to have experienced an ADE associated with 12 triggers (Table 1). All ADEs were categorised as ‘E’ (temporary harm not requiring or prolonging hospitalisation).

The investigators spent a total of 1400 minutes reviewing case notes.

Table 1. Triggers and adverse events identified

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Number identified</th>
<th>Number of ADEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiemetic</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Laxatives</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Plasma expander</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Unexpected medication stop</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Overdose/lethargy/falls</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Fall in haemoglobin&lt;25%</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Electrolyte abnormalities</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

Discussion
Eight patients (8/50, 16%) appeared to have experienced an ADE during their hospital stay. None of these adverse drug events were associated with permanent harm. The most serious outcome was a patient who collapsed following a dose of tamsulosin, a recognised side effect of alpha-blockers. Antiemetics and laxatives were often co-prescribed with opiates propranololically; on three occasions laxatives were used to treat opiate-induced constipation. Six unexpected medication stops were due to ADEs and in all these cases they were associated with another trigger, e.g. frusemide discontinued in a patient with dehydration and hypokalaemia who was also septic and pyrexic.

More than 23 hours was spent by investigators reviewing the notes. This represents 3 whole working days. Additionally an unknown amount of time was spent by staff in other departments to obtain the case notes for the audit. No cases of serious harm were identified. It is estimated that between 3.5–9% of inpatients may experience severe harm from their medicines. It might be expected that a review of 50 sets of notes would identify 2–4 harmful ADEs. However this was not our experience.

Pharmacists review medication charts for hospital inpatients daily and review laboratory results and clinical notes as part of the pharmaceutical care process. This retrospective case note review duplicates these activities and may therefore not represent good use of resources. A more efficient method of measuring the incidence of inpatient ADEs is needed. A trust-wide point prevalence study of the indicators used in this study is being evaluated.

Conclusion
Retrospective review of 50 sets of case notes for ADE triggers identified no medication incidents associated with serious harm and may not represent the most efficient ongoing method for detecting ADEs in UK hospitals.

References
5. Bloon G, Morse S, Cawell G. Specificity of trigger drugs as indicators of adverse drug events. UKCPA. November 2006

6 Separate storage of beta-lactams: impact on practice and knowledge

Oborne CA,1 Taher F, Torrens N, Lippett S, Smith F, Walker CA,1 Whelan G,1 Wan R2
1Pharmacy, Guy’s and St Thomas’ NHS Foundation Trust, London
2School of Pharmacy, London

Introduction
Allergy to penicillins is the most frequent cause of drug-induced immunological reactions1. Cross-sensitivity is about 10% for first generation cephalosporins and for carbapenems2. The Nursing and Midwifery Council standards for medicines management3 require checks of: patient identification, patient allergies, the drug’s therapeutic use, precautions and contraindications, before drug administration. In America, the Joint Commission for the Accreditation of Healthcare Organisations found substantial and sustained reduction in incidents after an alert requiring separate storage of concentrated potassium and the UK National Patient Safety Agency (NPSA) also advocates separate storage of high risk drugs1. In the study hospital, patients’ wrist bands specify patients’ identity and allergies.

Objectives
1. To observe nurses’ allergy checking in presence and absence of beta-lactam cupboards
2. To assess nurses’ opinion of which antibiotics are safe to give in penicillin allergic patients
3. To evaluate nurse opinion of penicillin cupboards and impact on drug administration
4. To quantify the accuracy of content of beta-lactam storage cupboards.

Method
One acute medical admissions ward (AW1) already had a beta-lactam cupboard but the other (AW2) did not. Beta-lactams (penicillins, cephalosporins, carbapenems) were moved to separate cupboards on three intensive care units (ICUs).

Registered nurses on AW1, AW2, and three ICUs after beta-lactam cupboard implementation, were observed during drug administration for checks of patients’ wrist band, and confirmation with patient (if conscious) about allergies. Drug chart allergy statement checking was too unreliable to assess by observation.

A questionnaire was distributed on morning, afternoon and night shifts to nurses on ICUs before cupboard implementation and AW2 nurses. It used closed questions to ask whether penicillins, antibiotics related to penicillins and non-beta-lactams were safe, contraindicated or ‘use with caution if no alternative’ in penicillin allergy.

A similar questionnaire to ICU nurses after cupboard implementation and AW1 nurses also included open questions assessing nurses’ opinions of the cupboards’ effect on their checking practice, patient safety, and their awareness of allergy to specific antibiotics. All questionnaires were anonymous to optimise participation.

Cupboard content was assessed 24 hours after stock delivery to the ward to identify if beta-lactams were incorrectly stored in general
cupboards and whether non-beta-lactams were stored in the beta-lactam cupboard. Data analysis included chi-square and Fisher exact test.

**Results**

**Checking for allergies:** Of 36 antibiotic dose administrations observed, patient wrist bands were checked 25/36 (69%) times. Of 25 occasions where patients were conscious, 14/25 (56%) were asked verbally about their allergies, Eleven (31%) patients were neither asked about allergies nor wrist band checked. More checks were made on wards with beta-lactam cupboards (chi-square, p=0.006) (Table 1). Most 23/24 (96%) beta-lactam doses observed were taken from the main cupboards or beta-lactam cupboard, one (4%) was taken from the bed-side locker.

**Staff knowledge:** Rating of individual antibiotics as safe in penicillin allergy was unchanged without and with beta-lactam cupboards for penicillin VK (0%:0%), co-amoxiclav (13%:8%), Augmentin (13%:32%), amoxicillin (5%:0%), benzylpenicillin (0%:2%), Taocin (49%:29%) and cefalexin (35%:19%) (Fisher p=>0.05). Rating of flucloxacillin (5%:0%), cefotaxime (58%:35%), ceftriaxone (60%:33%) and cefuroxime (48%:29%) as safe fell (p<0.05).

<table>
<thead>
<tr>
<th>Drug storage on the ward</th>
<th>No wrist band check or ask patient before administration</th>
<th>At least one check (wristband or ask patient) before administration</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No beta-lactam cupboard</td>
<td>9 (53%)</td>
<td>8 (47%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Beta-lactam cupboard</td>
<td>2 (11%)</td>
<td>17 (89%)</td>
<td>19 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>25</td>
<td>36</td>
</tr>
</tbody>
</table>

Ratings of gentamicin as safe in penicillin allergy increased (73%:94% p=0.01) but not clarithromycin, (78%:67%), vancomycin (75%:92%), or doxycycline (63%:55%) (p>0.05).

**Opinion of cupboard impact:** Nurses on AWI (13/13, 100%) and nurses on ICUs (33/42, 79%) were aware of the beta-lactam cupboards. They felt the cupboards affected their awareness of penicillin allergy (100%, 57%) and allergy to antibiotics related to penicillins (100%,67%) affected allergy-checking practice (69%,50%), increased patient safety (92%,74%), and affected penicillin-related incidents (70%,35%) respectively. Overall 95% nurses stated they would recommend implementation of cupboards throughout the hospital.

**Content accuracy:** Of 17 checks of the accuracy of drug stock cupboard content, non-beta-lactams were found in the beta-lactam cupboard seven (41%) times, including telithromycin, clarithromycin, vancomycin, co-trimoxazole, gentamicin. Beta-lactams were found in the main medicines cupboards six (29%) times including penicillins, flucloxacillin injection, azlocillin capsules, co-amoxiclav tablets.

**Discussion**

Separate storage of beta-lactams appears to improve the frequency of checking wrist bands and asking patients about allergies. Nurses were not informed of the specific purpose of observation thus an effect from observation is unlikely. However direct observation of drug administration does not reliably assess whether nurses read drug allergy statements when reading prescriptions on drug charts.

No change was seen for knowledge of safety of commonly prescribed penicillins, probably because knowledge was already high, particularly on acute medical admission wards.

Nurses indicated the cupboards reduced risk but some felt the ICU cupboards were poorly advertised and could be better labelled. Clearer posters on the outside of cupboards specifying that these antibiotics are contraindicated in penicillin allergy may be an educational tool.

Including second and third generation cephalosporins (with very low or no cross sensitivity) may confuse staff and these drugs should be removed.

The effect of beta-lactam cupboards is lost if stock cupboard contents are inaccurate, which was common, or if doses are given from bed-side lockers, which was rare. There is still room for improvement, particularly nurses’ knowledge of specific antibiotics and storage accuracy.

**References**

Evaluating the introduction of lanthanum — a novel non-calcium based phosphate binder — into the treatment of hyperphosphataemia in patients receiving either haemodialysis or peritoneal dialysis

Murray AEM, Snape JM, Drinkwater A
University Hospital of North Staffordshire, Stoke-on-Trent

Introduction
Persistent hyperphosphataemia in dialysis-dependent patients is associated with increased morbidity and mortality. The role of hyperphosphataemia in the development of secondary hyperparathyroidism and the development of high turnover bone disease is well documented. Hyperphosphataemia also contributes to vascular calcification, arterial stiffening and the development of cardiovascular disease, known to be the leading cause of death in this patient group. K-DOQI (Kidney Disease Outcomes Quality Initiative) guidelines for dialysis-dependent patients state that pre-dialysis serum phosphate levels should be maintained between 1.13 – 1.78mmol/L ([2]. A significant proportion of patients do not achieve this target serum phosphate level even with dietary advice and phosphate binder treatment.

Aim and objectives
This audit aimed to assess how the introduction of lanthanum has affected serum phosphate control in a small group of dialysis-dependent patients who had previously been unable to tolerate their phosphate binders or who had exhibited poor phosphate control even with high doses of phosphate binders. The objectives of this audit were:

- (i) to establish how many patients were compliant with the K-DOQI guideline for serum phosphate control – target 1.13 - 1.78mmol/L (main audit standard)
- (ii) to quantify the change in average serum phosphate levels before and after lanthanum's initiation

Methods
Using departmental records of Non-Formulary applications received to initiate lanthanum treatment between May 2007 and October 2007, dialysis-dependent patients treated with lanthanum were identified. Reasons for the initiation of lanthanum and discontinuation of any of the patient's previous phosphate binders were recorded. The pharmacy computer dispensing system was searched to determine the dose of lanthanum prescribed, while the patient's previous phosphate binder therapy was ascertained by the Advanced Pharmacist Practitioner - Renal Medicine.

The date of the receipt of the application to initiate lanthanum was used as the date for lanthanum's commencement. An average pre-dialysis serum phosphate level in the preceding three months prior to lanthanum's initiation, and in the subsequent three month period after lanthanum was commenced, was calculated. For a two week period immediately after lanthanum’s commencement serum phosphate levels were discounted from the analysis. A comparison of the number of patients meeting K-DOQI guidelines for phosphate control before and after lanthanum initiation could then be made. A crude cost comparison was also made to determine the difference in expenditure relating to the change in therapy.

Results
Eighteen dialysis-dependent patients were identified; six of whom were on peritoneal dialysis with the remainder on maintenance haemodialysis patients. The most frequent reason for lanthanum’s initiation was intolerance of, or non-compliance with sevelamer (n=13). Before lanthanum was initiated, compliance with K-DOQI guidelines for phosphate control was achieved in 4 patients (22%) in the preceding three months. After lanthanum’s initiation, 7 patients (39%) achieved compliance in the three month period after lanthanum was commenced (table 1).

| Table 1: Percentage compliance with K-DOQI guideline for pre-dialysis serum phosphate levels |
|---------------------------------------------|---------------------------------------------|
| Pre-lanthanum initiation (n=18)            | Post-lanthanum initiation (n=18)            |
| 22%                                        | 39%                                        |

Furthermore, mean serum phosphate levels decreased significantly from 2.27mmol to 1.99mmol/l (P=0.07, paired t-test) after the initiation of lanthanum (table 2).

| Table 2: Effect of switch of phosphate binder to lanthanum on serum phosphate levels |
|---------------------------------------------|---------------------------------------------|
| Pre-Lanthanum                              | Post-Lanthanum                              |
| Mean serum phosphate (mmol/l) + SD         | Mean serum phosphate (mmol/l) + SD         |
| Range (mmol/l)                             | Range (mmol/l)                             |
| 2.27+0.51                                  | 1.99+0.49                                  |
| 1.5-3                                      | 1.2-2.8                                    |

On the assumption that patients were filling their prescriptions as the prescriber intended, there would be a considerable reduction in expenditure post lanthanum initiation. Annualised expenditure for this group’s (n=18) phosphate binder treatments would be reduced by 66%, representing a net expenditure reduction of £68000 (based on hospital acquisition costs).

Discussion
The patients included within this audit were among the first to be prescribed lanthanum and perhaps represented a patient group whose main difficulty was tolerating / complying with their previous phosphate binders, especially with high dose sevelamer-based therapy.

The applicability of these results to the wider dialysis-dependent patient group is unclear; however these results would suggest that phosphate control with lanthanum is not inferior to other commonly used treatments. Indeed this small audit indicates lanthanum may achieve a better degree of phosphate control in patients who are not tolerating high dose sevelamer-based phosphate binder therapy.

The difference in expenditure on phosphate binder treatments demonstrated in this audit would indicate lanthanum to be more cost effective than high dose sevelamer treatment. However, the size was small and consequently the results should be interpreted cautiously. It would be desirable to study lanthanum’s use as a phosphate binder in a larger study group to enable a more robust assessment of its efficacy.

ACKNOWLEDGEMENT The authors would like to extend their appreciation to Dr S Tagboto (Consultant Nephrologist, University Hospital of North Staffordshire) for providing clinical guidance into the production of this abstract.

References
2 Use of the MIdatabank medicines information enquiry database by specialist pharmacists

O’Sullivan P, Ng J, Cann S
Pharmacy Department, Imperial College Healthcare NHS Trust, London

Introduction
MIdatabank is a paperless medicines information management system developed by CoAcS Ltd (Bath, UK) in association with UK Medicines Information (UKMI), as a national system for the UK. Future versions of the database are planned to include features aimed at increasing its usefulness for clinical pharmacists, both as a source of information and as a means to enter their own enquiries. The software was installed in the Medicines Information (MI) departments at Charing Cross and Hammersmith Hospitals in 2006. This provided the opportunity to explore its potential for use by specialist clinical pharmacists within our Trust.

Objectives
Our objectives were:
- To explore whether MI enquiries could be logged on the database and completed by specialist clinical pharmacists
- To determine what proportion of the workload of the MI department had the potential for referral to specialists
- To determine how many enquiries in a typical month were actually referred

Methods
Sixteen specialist clinical pharmacists were trained in searching and entering data in the MIdatabank database (v1.3) between February and September 2007. From October 2007, MI staff were asked to refer enquiries to a specialist pharmacist wherever possible, and to complete only those enquiries where the specialist was unable to assist. Daily reports of all enquiries completed were sent to specialists by email. Specialist pharmacists were also encouraged to enter and answer enquiries directly on the database themselves wherever possible. MI workload data were obtained using the MIdatabank reporter function for a six month period from October 2007 to March 2008. Enquiries from patients and those originating from pharmacy staff were regarded as core MI enquiries, along with enquiries originating from specialties without a nominated specialist pharmacist within our Trust. The remaining enquiries had the potential for referral to specialist pharmacists. Enquiries from a one month period (January 2008) were hand searched to explore their involvement.

Results
During the six month period, 2250 enquiries were logged on the MIdatabank database. Of these, 22 enquiries (1%) were entered and completed by specialist pharmacists (n=8) without MI staff assistance.

<table>
<thead>
<tr>
<th>Table 1: Examples of MI enquiries completed by specialist pharmacists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enquiry title</strong></td>
</tr>
<tr>
<td>Can a haemodialysis patient breastfeed?</td>
</tr>
<tr>
<td>Can risperidone cause alopecia?</td>
</tr>
<tr>
<td>What are the therapeutic drug levels for maxifloxacin and linezolid?</td>
</tr>
<tr>
<td>Can methylprednisolone injection be given orally?</td>
</tr>
<tr>
<td>What malaria prophylaxis is suitable for a sickle cell patient?</td>
</tr>
</tbody>
</table>

Examples are given in table 1. A further 1301 enquiries (58%) were considered to be core MI enquiries. The remaining 927 enquiries (41%) originated from directorates with a specialist clinical pharmacist, and were potentially suitable for referral.

In the one month period examined in detail (Figure 1), 375 MI enquiries were logged on the database. Four enquiries (1%) were entered and completed by specialist pharmacists.

Specialists took over 2 enquiries (0.5%) from MI staff, and offered advice and information in a further 36 enquiries (9.5%). Specialists were occasionally unable to help or impossible to contact, and 37 enquiries (10%) were considered straightforward and inappropriate for referral. In the remaining 52 enquiries (14%), reasons for not contacting a specialist were not documented.

Discussion
Training specialist clinical pharmacists in use of the MIdatabank database has enabled them to enter and answer some MI enquiries without the assistance of MI staff, and to provide valuable information and advice in answering a larger number of other enquiries. We believe that this has facilitated closer working between the MI department and clinical specialists in our Trust, and increased the usefulness of the database as an information resource for the whole pharmacy.

A training commitment is necessary in order to enable specialist pharmacists to use the MIdatabank database. We found that approximately one hour per specialist was required, with little further support needed. The one month period examined in detail may not have been representative of a normal month. However, the reduction in enquiry workload observed, while small, has allowed MI staff to begin to focus on other tasks such as developing clinical guidelines. This effect could increase over time as specialists’ familiarity with the database increases. A proportion of enquiries, notably enquiries from the patient helpline, have remained core MI activities.

Further work could further examine the types of enquiries suitable or unsuitable for referral to specialists, reasons for non-referral, and differences in the approach to enquiry answering between MI staff and specialist pharmacists.

References
3 Implementing and evaluating evidence-based clinical pharmacy for older people admitted to a secondary care trust

Blagburn J and Acomb C
Leeds Teaching Hospitals NHS Trust, Leeds, UK

Introduction
Despite a scarcity of quality outcome research, the value of a clinical pharmacy service to patients has been accepted.12 Recently, multivariate analyses in the US and the UK have demonstrated a link between certain types of clinical pharmacy provision and a reduction in length of hospital stay and mortality rates.13,14 However, the priorities for practitioners of clinical pharmacy for older people are not well defined. Individual pharmacists have had to develop their own practice, largely guided by risk issues and by government targets. We felt that if a standardised, evidence-based model of care could be developed and implemented this could have significant benefits for patient care.

This paper describes the model of clinical pharmacy for older people that we developed at the trust between 2004 and 2006, how it was implemented and evaluated throughout 2006–7 and our findings.

Objectives
To develop, implement and evaluate an evidence-based model of clinical pharmacy for older people within a secondary care trust.

Method
An extensive literature review and stakeholder consultation was undertaken by one of us (JB). The clinical pharmacy team for medicine for older people at Leeds Teaching Hospitals NHS Trust developed an evidence-based, outcome-oriented model of care from the evidence base and the National Service Framework (NSF) for Older People. Six standard operating procedures (SOPs) were developed. These focused on medicines reconciliation, medicines management, resolution of drug-related problems, monitoring for and reporting adverse reactions, supporting concordance and seamless discharge to primary care. Documentation was developed to enable the pharmacists and technicians to record the care they provided. This medicines management record card is kept with the patient’s prescription chart so that it is accessible to the multidisciplinary team and becomes part of the patient record on discharge.

Our trust divides easily geographically into two halves so to test the new model of care it was implemented on one side of the city only. Patients and clinical pharmacists on the other side of the city acted as a control group. Outcome measures were chosen to reflect the aims of the NSF for older people, namely safe, effective, cost-effective drug use and avoidance of iatrogenic illness. Appropriate statistical tests were applied to the outcome data to test the hypothesis that there would be no significant difference in any outcome measure between intervention and control groups. At the end of the 12 month pilot, physicians and pharmacists completed a survey about their inter-professional relationships and perception of the new model of care. Pharmacists were also asked how the change in clinical practice had affected them and what they perceived the advantages and disadvantages to be.

Results
Patients proved difficult to engage as stakeholders in the service redesign and so older peoples’ local action groups were consulted in their place.

There was no significant difference between observed and expected length of stay, mortality rate or readmission rate in the intervention group during the pilot. Inpatient mortality rate was higher than expected in the control group as shown in table 1. There were significantly more pharmacist interventions (X²=20.57, df=1, p<0.001) and medication incident reports (X²=12.83, df=1, p<0.001) in the new model of care.

The time–motion studies showed that pharmacists working with the new SOPs spent less time on prescription charts and more time resolving drug related problems. Significant correlations between clinical pharmacist activities warrant further investigation; for example, pharmacists who spent most time talking with patients made the most interventions with physicians. Compliance with the new SOPs was typically around 60% with wide inter-practitioner variability. There was no significant difference in drug expenditure between the intervention and control groups.

The new model of care was well received by physicians. Indeed information on the Medicines Management Record Card was commonly used by physicians at the end of the pilot. The ten clinical pharmacists who had worked with the new model of care unanimously felt their confidence and skill as a practitioner had improved as a result of working within the SOPs and that the SOPs were not difficult to use. Only one would have preferred to revert to their old way of working instead of using the new SOPs.

Discussion
The new model of care was well received and has been adopted trust-wide following this study. It enabled the pharmacists to focus on drug related problems. Improved resolution of drug related problems may have had a positive impact on inpatient mortality rate in the intervention group. Increased reporting of pharmacist interventions and medicine related incidents suggests a safer system had been created in the intervention group. Further work and subgroup analysis may reveal areas of practice that have a significant benefit on patient care.

References
5 Anon. Lives can be saved by investing in clinical pharmacy services. Hospital Pharmacist 2006; 13: 387.

Table 1: Inpatient mortality rates (%)

<table>
<thead>
<tr>
<th>Patient group</th>
<th>Year before intervention</th>
<th>First year of intervention</th>
<th>Chi-square test for difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention group (n = 8290)</td>
<td>15.1</td>
<td>16.0</td>
<td>Not significant</td>
</tr>
<tr>
<td>Control group (n = 8,870)</td>
<td>11.1</td>
<td>13.1</td>
<td>X²=3.57, df=1, p=0.059</td>
</tr>
</tbody>
</table>

4 Developing a programme to enhance provision of clinical placements in undergraduate pharmacy education

Parsons C*, Haughey S*, O’Hare R**, Ashfield L***, King K****, Laird S**, Shephard L***** and Collier P*
School of Pharmacy, Queen’s University Belfast*, Craigavon Area Hospital **, Ulster Hospital, Dundonald ***, Altnagelvin Area Hospital, Londonderry ****, Antrim Area Hospital*****

Introduction
Pharmacy education in the UK has been criticised for providing insufficient practical clinical exposure to generate professionalism in
undergraduates. Clinical placement provision within the MPharm degree at the School of Pharmacy has traditionally been limited to one half-day placement in Level 3 and two half-day placements in Level 4. Funding was provided by the University and the Department of Health, Social Services and Public Safety (DHSSPS) for an expanded Clinical Placement Programme (introduced in the 2007–2008 academic year) and provided a unique opportunity to create five new Teacher Practitioner (TP) posts, based in Trust hospitals. These TPs have worked in partnership with the two Clinical Placement Co-ordinators in the School, to develop a Clinical Placement Programme to be delivered using a variety of methods including workshops, bedside teaching and experiential learning. The clinical placements have been incorporated into the existing MPharm degree programme in each of the four years of the course; students in Level 1 undertake a half-day placement, while students in Level 2 undertake a two-day placement, and those in Levels 3 and 4 are on placement for one week. These new placements were designed with the objective of providing students with an opportunity to apply their clinical knowledge and skills to real-life situations and to promote professional attitudes and behaviours.

**Objectives**
The present study was undertaken to determine the views of the first cohort of students to undertake placements in the new programme (Level 3 students).

**Method**
A questionnaire was designed and administered to Level 3 students who had undertaken the week-long clinical placement. Ethical approval was obtained and the questionnaire distributed to the students for completion. Questions solicited information on placement organisation, travel arrangements, helpfulness and approachability of the TPs, and on whether the placement had provided opportunities to develop knowledge and skills, or had influenced future career plans. In answering each question, students were asked to indicate their level of agreement with a number of statements by selecting SA (strongly agree), A (agree), N (neither agree nor disagree), D (disagree) or SD (strongly disagree).

**Results**
Of the 114 students who undertook the clinical placement, 105 students returned questionnaires, yielding a response rate of 92.1%. Analysis of the responses indicated that overall the students had enjoyed the placements, finding placement organisation and travel arrangements satisfactory. However, only 54% of the respondents agreed or strongly agreed that completion of the reflective portfolio encouraged them to engage in self-directed learning. More than 90% of the students agreed or strongly agreed that the TPs and clinical pharmacists in the hospitals were helpful, approachable and asked challenging questions. Students were then asked which skills, if any, they felt they had developed whilst on placement, and their responses are detailed in Table 1.

### Table 1: Student responses regarding the skills they developed on clinical placement

<table>
<thead>
<tr>
<th>Question</th>
<th>Number (%) of students who responded to the question in each category</th>
</tr>
</thead>
<tbody>
<tr>
<td>The clinical placement helped me to develop the following skills:</td>
<td>SA</td>
</tr>
<tr>
<td>Communication with patients</td>
<td>47 (45)</td>
</tr>
<tr>
<td>Communication with pharmacist colleagues and other healthcare professionals</td>
<td>53 (50)</td>
</tr>
<tr>
<td>Presentation skills</td>
<td>53 (50)</td>
</tr>
<tr>
<td>Team work</td>
<td>51 (49)</td>
</tr>
</tbody>
</table>

90% or more of the students agreed or strongly agreed that their communication skills (with patients, pharmacists and other healthcare professionals), presentation skills and team-working skills had been developed. Students were also invited to detail other skills they felt they had developed; one student stated that the placement gave “confidence in applying my knowledge”, one felt that skills in “counselling patients” were developed, whilst one identified “problem-solving” skills.

With regard to clinical knowledge, 98% of the students agreed or strongly agreed that the clinical placement helped them to apply their knowledge, while all students agreed or strongly agreed that the placement improved their knowledge. In relation to influencing future career plans, 71% of the students indicated that the placement had made them more likely to pursue a career in hospital/clinical pharmacy.

**Discussion**
This study highlights the students’ satisfaction with the newly expanded clinical placement programme. Analysis of the responses to the questionnaire has demonstrated that the students felt that their clinical knowledge had improved and that the placement enabled them to apply this knowledge. Furthermore, students felt that the placement had provided them with opportunities to develop skills such as communication, team-working and presentation skills, and made them more likely to consider hospital/clinical pharmacy as a future career choice. These findings are in agreement with those obtained at Aston University following expansion of clinical placement provision.

The questionnaire also identified a number of areas where improvements could be made, such as improving student engagement with the reflective portfolio and increasing patient contact and time on the wards. These will be considered for future placements, both in Level 3 and in other years of the MPharm degree programme.

**References**
1. Nathan A. Pharmacy education in the UK needs an overhaul. Pharmaceutical Journal 2006; 277: 747

---

**Tailoring pharmacy services to meet the needs of the admissions ward**

**Morgan HR**
Pharmacy Department, Chelsea and Westminster NHS Foundation Trust, London

**Introduction**
With pressure on hospitals to decrease the waiting times in emergency departments and reduce the length of hospital stays, patient turnover in admissions wards is becoming increasingly rapid. Over the last few years we have adapted the pharmacy service to our admissions ward to ensure that it meets the changing needs of the ward.

Our resident pharmacists had traditionally visited the admissions ward at midnight. The purpose of this visit was to confirm drug histories for new admissions, supply new items and assess patients own drugs. Midnight was originally chosen because this was when the residents finished their work in the dispensary. However it became apparent that this time did not suit the ward as patients were often asleep. Also, medications were often required before midnight so the nurses had to send the charts to pharmacy for dispensing in advance of the pharmacist’s visit. Therefore we moved the time of the visit from midnight to 8pm.

Secondly, with the rapid turnover of patients on the admissions ward, timely provision of discharge medication (TTOs) is absolutely essential to avoid blocking of beds. Various methods of speeding up TTOs have been investigated previously1,2. We decided to implement a ward dispensing service using a JAC labelling system to label ward stock. We
have a Pharmacist and Medicines Management Technician (MMT) based on the ward who are available to provide this dispensing service amongst other duties.

**Objectives**
- To assess the impact of changing the time of the resident pharmacist visit on the management of medication requests from the admissions ward.
- To assess the impact of full time pharmacy staff on the admissions ward using a ward based JAC labeller on the response time and preparation time of discharge medication.

**Method**
The number and timing of bleeps received by the resident pharmacist were collected from the record forms that are used to document resident calls. This data was collected for 2 months prior to moving the visit to 8pm and for 4 months after the change.

The dispensary turnaround time of urgent TTOs was obtained from the dispensary workload log. The time taken to dispense TTOs dispensed on the ward was collected by the ward-based medicines management technician. The response time for TTOs by the ward-based pharmacy staff was compared to 2 general medical wards who have more traditional twice daily ward visits. The response time was measured as the time between the TTO being prescribed and the TTO being clinically screened by the pharmacist. These times were obtained from our electronic prescribing system.

**Results**

**Resident Pharmacist Visit**: 4 months after the resident pharmacist visit had been moved to 8pm the total number of bleeps received from the admissions ward had decreased by 43%. The detailed breakdown of the number of bleeps is shown in Table 1.

**Discharge Medication**: Dispensing TTOs on the ward saved an average 41 mins per prescription. See Table 2. The average response time for TTOs was 3 minutes for the admissions ward compared to 1 hour 18 minutes and 2 hours 28 minutes for the 2 general medical wards.

**Discussion**
The nurses are aware of the new timing of the resident pharmacist visit so, unless medication is very urgent, they keep the charts on the ward for review by the pharmacist at 8pm. This means that the pharmacist’s workload is better planned rather than getting interrupted frequently by bleeps, any problems are resolved more easily at ward level, patients own medicines can be assessed and authorised for use thereby reducing the amount of dispensing required, nursing time spent bleeping the pharmacist and sending drug charts to pharmacy is reduced and the drug charts stay on the ward so they are available for review by the medical staff on the ward round.

Two of the steps in the process of preparing discharge medication are the ward getting the TTO to the pharmacist and the dispensing of the medication. Both of these steps are significantly reduced by having pharmacy staff based on the ward and providing a labeller on the ward that can be used by these staff to dispense medication.

**References**

---

**Table 1: Reduction in the number of bleeps received by the resident pharmacist**

<table>
<thead>
<tr>
<th>Number of Bleeps per month (Monday–Friday)</th>
<th>Early evening (6 to 9pm)</th>
<th>Night time (9pm to midnight)</th>
<th>Early morning (Midnight to 4am)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>May and June 06</td>
<td>62</td>
<td>65</td>
<td>20</td>
<td>147</td>
</tr>
<tr>
<td>July and August 06</td>
<td>37</td>
<td>48</td>
<td>17</td>
<td>102</td>
</tr>
<tr>
<td>Reduction in number of bleeps immediately after introduction</td>
<td>40%</td>
<td>26%</td>
<td>15%</td>
<td>31%</td>
</tr>
<tr>
<td>Sept and October 06</td>
<td>29</td>
<td>35</td>
<td>20</td>
<td>84</td>
</tr>
<tr>
<td>Reduction in number of bleeps 2 months after introduction</td>
<td>9953%</td>
<td>46%</td>
<td>0</td>
<td>43%</td>
</tr>
</tbody>
</table>

**Table 2: Time to dispense TTOs on the ward compared to in the dispensary**

<table>
<thead>
<tr>
<th></th>
<th>Mean (Mins)</th>
<th>Median (Mins)</th>
<th>Range (Mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispensary</td>
<td>49</td>
<td>45</td>
<td>4 - 151</td>
</tr>
<tr>
<td>Ward</td>
<td>8</td>
<td>5</td>
<td>3 - 20</td>
</tr>
<tr>
<td>Time saved</td>
<td>41</td>
<td>40</td>
<td>1 - 131</td>
</tr>
</tbody>
</table>

---

**Hameln Poster Winner 2008 (1)**

**Medicines reconciliation by pharmacy staff at weekends on the Acute Medical Unit (AMU) in the Chelsea & Westminster hospital**

**Scarle S**

Chelsea & Westminster NHS foundation Trust, London

**Introduction**
Medication errors occur most commonly on transfer between care settings and at the time of admission. These errors can lead to considerable patient harm. In a recent joint publication with the NPSA, NICE reported that pharmacist involvement in medicines reconciliation resulted in fewer discrepancies between hospital and home medications compared with nurse or doctor-conducted histories. It is therefore recommended that pharmacists confirm drug histories as soon as possible after admission and a time limit of 24 hours has been suggested as a reasonable target. At one London teaching hospital, a weekend ward-based pharmacy service has been recently initiated, in addition to weekday hours, to meet the increasing workload of the AMU. This audit was undertaken to assess the impact of the weekend pharmacy service with regard to the timely reconciliation of patients’ medication.

**Objective**
- To assess adherence to the locally agreed pharmacy standard that 90% of drug histories should be confirmed by a pharmacist/ pharmacy technician within 24 hours of a patient’s admission (set at 90% to reflect restricted GP opening hours at weekends)
- To investigate reasons for non-adherence by evaluating the methods of medicines reconciliation

**Method**
Data was collected at weekends over a two month period (16 days) from November 2007 to January 2008. All pharmacists scheduled to work on the AMU during the data collection period were briefed and asked to record the time and date that each drug history was confirmed, along with the method used e.g. GP ‘patients own drugs’ (PODs). Patients admitted onto the AMU between midnight on Friday and midnight on Sunday were identified via the admissions book on the ward and the hospital’s electronic patient records system was used to identify the time of patient admission. A standard data collection tool was used to record the required information, taken directly from drug charts, which were
located after each weekend. The time difference between admission to the AMU and completion of the drug history was calculated and data was analysed using simple descriptive statistics.

Results
During the period of this study there were 19 patient admissions, however, 130 drug charts were located. A further five patients were discharged within 12 hours of admission onto the AMU and it was felt that these patients should be excluded from the results as it is not always practical or necessary to confirm a drug history within such a short time frame. For the remaining 125 patients, a drug history was confirmed within 24 hours for 97 (78%) patients.

The methods used to obtain the drug histories for the 28 patients (22%) confirmed outside the 24 hour window were variable (table 1).

The reasons that a drug history was not confirmed in three patients are unknown and the remaining two patients could not speak English. Five patients were able to recall their own drug history and/or bring in PODs and therefore the drug histories could have potentially been confirmed within 24 hours. The reasons that they were not are unknown. This similarly applies to the patient whose drug history was confirmed using a recent DSUM but clarification occurred greater than 24 hours after admission.

Discussion
Adherence to the standard occurred for only 78% of patients during this audit and therefore the proposed target of 90% was not achieved. One reason for this is that majority of patients that fell outside the standard could not recall details of their medications and contact with their GP surgery was required for confirmation. As few GP surgeries are currently open at weekends, a delay in medicines reconciliation is likely. This is something that may change in the future with the development of the central health information spine which will make it easier to share patient information and facilitate the drug history taking process. However this is not an immediate solution and it is clear that in order to improve adherence to the standard and comply with NICE/ NPSA guidance the focus needs to be on other methods of medicines reconciliation. Increased utilisation of information from Community Pharmacies may aid the process and discharge summaries and PODs can also act as a prompt for patients. Patients are encouraged to bring PODs into hospital but some may be discouraged by previous experiences where their medications were lost during transfer or inadvertently discarded. Effective transfer of PODs may therefore be an area to improve to facilitate drug history taking. For patients that do not speak English, a translator service at weekends would be helpful to ensure correct documentation of medication. This audit suggests that timely medicines reconciliation at weekends is possible for the majority of patients but identifies areas to target in order to achieve both the locally agreed standard and the optimum of 100%.

Table 1: Methods of medicine reconciliation for patients where the drug history was completed more than 24 hours after admission (n=28)

<table>
<thead>
<tr>
<th>Method of obtaining drug histories</th>
<th>Drug history</th>
<th>DSUM* not confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP surgery</td>
<td>Patient/PD</td>
<td>Relative</td>
</tr>
<tr>
<td>No. of patients</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>% of patients</td>
<td>57</td>
<td>18</td>
</tr>
</tbody>
</table>

*DSUM = Electronic discharge summary from previous admission (only used to facilitate drug histories if dated within 3 months of current admission)

References
Students enjoyed patient interaction, which is central to their future role as practising pharmacists. Evaluation of the other sessions revealed that the more practical aspects eg. answering practice MI queries and aseptic manipulation, were popular with students, whereas lectures proved less popular. Students also remarked about the poor timing of the placement in relation to their examinations. Analysis of the pharmacist/technician role exercise revealed an enhanced understanding of roles at the end of the placement.

Feedback from staff who assisted during the placement was mixed. Positive aspects included student interest and good organisation. Negative aspects included the number of students per session (too many) and their limited therapeutic knowledge, rendering it difficult for effective student participation and teaching at ward level.

Discussion
The placement achieved the objective of introducing students to aspects of hospital pharmacy, with many students commenting on having acquired new knowledge of hospital pharmacist roles. This was also undertaken successfully by Hindle et al., 2007. Some students also expressed an interest in a future hospital pharmacy career, and although not directly measured during this placement, the impact of undergraduate hospital pharmacy placements on pre-registration applications will be assessed in 2009. Negative aspects of the staff feedback will be taken into consideration in order to improve next year’s session eg. reducing the number of students per session which will ease staff pressures and improve student learning. The TP’s biased with QUB regarding the timing of the placement in relation to examinations and possible alterations to the undergraduate course structure in order to improve therapeutic knowledge.

Reference

Using the patient’s journey to introduce pharmacy undergraduates to the roles of the clinical pharmacist.

Ashfield L1, O’Hare R2, Laird S3, King K4 and Sheppard L4
1South Eastern Health and Social Care Trust; 2Southern Health and Social Care Trust; 3Western Health and Social Care Trust; 4Northern Health and Social Care Trust.

Introduction
A Teacher Practitioner Team was funded in Northern Ireland to develop a hospital based teaching programme for undergraduate students at Queen’s University Belfast. This was to include introductory sessions in year one and two, culminating in week long clinical placements in years three and four. The 2007–8 Level 3 students were the first cohort to visit participating hospitals for their clinical placements.

Objectives
● Identify the role of clinical pharmacists within the healthcare team
● Appreciate how these roles contribute to the care of patients
● Develop and apply clinical pharmacy skills to real life patient scenarios

Method
The placement programme was designed to reflect the patient’s journey through secondary care. The students were each given a hospital placement portfolio to read prior to the placement. This provided them with an overview of the week and also some practical guidance on issues such as dress code, confidentiality issues and general behaviour on the wards.

During the placement the Team members delivered tutorials and workshops each morning to introduce the various roles and the skills required to undertake these roles (We also made it clear that many of these skills were also required for working in the community pharmacy setting) This was followed each afternoon by a ward visit with clinical pharmacists that gave students the opportunity to practice their newfound skills on actual patients (Table 1). Each day concentrated on a different stage of the patient’s journey through the hospital and linked this to the pharmacist’s role. On the final day each student then presented a case to their peers and the Teacher Practitioner which was peer assessed. Assessment of the students was also conducted during the week using a variety of other methods including Multiple Choice Questions, observation and written Pharmaceutical Care Plans. A mandatory question was also included in the exam paper for the pharmaco therapy module.

Results
At the end of the week students were asked for their opinion on the content of the placement using an evaluation form. They were asked to rate the week overall and to comment on what they liked best and least and what one thing they would take away from the week.

Of the 116 students who undertook the placement 97 % thought it was good or very good with the other 3% rating it as satisfactory.

Replies to ‘One thing they would take away from the week’ included:
● ‘Importance of communication and presentation skills to a pharmacist’
● ‘Role of pharmacist as part of ward MDT’
● ‘How to interact with patients’
● ‘Patients all have different journeys’
● ‘Teamwork’
● ‘You need to do a lot of background work before speaking to a patient’

General student comments about the placement are included below:
● ‘Too much assessment’
● ‘I enjoyed the week and felt it gave me more confidence to interact with my peers and other Health Care Professionals’

Table 1: Programme for the clinical placement.

<table>
<thead>
<tr>
<th>Day</th>
<th>am (classroom based)</th>
<th>pm (ward based)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Introduction to placement</td>
<td>Introduction to ward environment and patient documentation</td>
</tr>
<tr>
<td></td>
<td>Role of clinical pharmacist</td>
<td>Take a medication history from a patient</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Medication history taking</td>
<td>Develop a care plan for a patient on the ward</td>
</tr>
<tr>
<td>Wednesday</td>
<td>Pharmaceutical care plans</td>
<td>Counsel a patient on their medications</td>
</tr>
<tr>
<td></td>
<td>Clinical interventions</td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td>medication counselling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discharge planning</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>Case presentation</td>
<td></td>
</tr>
</tbody>
</table>
Keep ‘in’ the reach of children – introducing Hospital Pharmacy as a career to Year 10 students

King K, Traynor O and McCarron M
Pharmacy Department, Altnagelvin Hospital, Western Health and Social Care Trust, Londonderry, Northern Ireland

Introduction
New methods of promoting Pharmacy and ultimately recruiting staff are required within the Western Health and Social Care Trust (WHSCFT) given a low response to advertised posts. The opportunity to participate in a ‘Real World Science Conference’ for Year 10 students was extended to WHSCFT and a Team (teacher practitioner, senior pharmacist and senior pharmacy technician) attended to deliver practical teaching.

Objectives
The Team aimed to highlight how Hospital Pharmacy practice links healthcare with science while ensuring the safe use of medicines. The workshop sought to introduce Hospital Pharmacy as a viable career option and offer interactive, fun activities.

Method
The event sponsor extended invitations to a number of schools in the North West to each send fifteen Year 10 students to the conference. There were 23 interactive workshops allowing students to sample a diverse range of careers including forensics, robotics, rocket science, civil engineering, and podiatry. Approximately 280 students attended and each participated in three workshops. The Hospital Pharmacy workshop was delivered three times to a maximum of 12 students per workshop.

The Team did not know if the workshop was one of the students’ preferred choices. The workshop was planned around five areas:

- An initial PowerPoint presentation to provide information on Pharmacy including the variety of roles and qualifications required;
- A Dispensary workstation where students learned the legal requirements of a prescription, reviewed a doctor’s prescription, designed a label for the medicine and finally prepared the suspension using placebo tablets;
- An Aseptics workstation where a Team member demonstrated pharmaceutical incompatibilities with intravenous medicines. Students then had the opportunity to prepare an injection for a patient using needle-free transfer devices and syringes;
- A Medicines Information (MI) workstation where a choice of activity was offered. Some students identified mystery tablets from photographs and reference texts, and some students answered an interactive, computerised ‘ethical dilemma’; and,
- Additional visual activities such as a video of a dispensing robot and agar plates showing growth from everyday objects including hair, carpet, and door handles.

The workshop was held in a school laboratory. The workstations were designed to be hands-on, interesting and educational. Each student participated in all workstations.

Results
Evaluation of the workshop occurred at the end of each session using a questionnaire and observation. The questionnaire was designed to be simple and quick to complete as the students were required to attend further workshops following a short break. A total of 31 completed evaluation forms were received from 35 students attending the workshops (response rate 89 percent). Table 1 shows the results of the teaching provided on Hospital Pharmacy practice for the responding students.

All students felt they had learned about Hospital Pharmacy practice from attending the workshop. 3 students (11 percent) were really interested in and 25 students (86 percent) might consider a career in

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>% Response</th>
<th>% Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much did you learn about Hospital Pharmacy?</td>
<td>Lots</td>
<td>65</td>
<td>Some</td>
</tr>
<tr>
<td>How much fun was the Dispensary workstation?</td>
<td>Lots</td>
<td>58</td>
<td>OK</td>
</tr>
<tr>
<td>How much fun was the Aseptics workstation?</td>
<td>Lots</td>
<td>71</td>
<td>OK</td>
</tr>
<tr>
<td>How much fun was the MI workstation?</td>
<td>Lots</td>
<td>42</td>
<td>OK</td>
</tr>
<tr>
<td>Which activity did you do?</td>
<td>Mystery tablet</td>
<td>45</td>
<td>Ethical dilemma</td>
</tr>
<tr>
<td>How interesting were the other activities (video, agar plates)?</td>
<td>Really interesting</td>
<td>37</td>
<td>OK</td>
</tr>
<tr>
<td>How interested are you in a career in Pharmacy now?</td>
<td>Really interested</td>
<td>3</td>
<td>Might consider</td>
</tr>
<tr>
<td>What was the best bit of the workshop and why?</td>
<td>Aseptics and dispensary workstations – very practical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptics workstation – using syringes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dispensary workstation – making a medicine</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethical dilemma</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finding out about drugs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agar plates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What was the worst bit of the workshop and why?</td>
<td>No worst (majority)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MI workstation – no practical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mystery tablet – boring, out of book</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethical dilemma - hard</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Talking</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pharmacy as a result. The Aseptics workstation proved most popular with the students, followed by the Dispensary workstation, the MI workstation and finally the additional visual activities.

Discussion
The workshops clearly met their objectives in providing information on Hospital Pharmacy practice as a career and in being fun and interactive. Similar success has recently been reported by researchers at the University of Manchester in promoting Pharmacy in primary schools.1 Students preferred the hands-on Aseptics and Dispensary workstations where they manipulated syringes or crashed tablets, and made an important medicine for a patient. The Medicines Information workstation was less enjoyable. The students found the ‘ethical dilemma’ challenging. The mystery tablet identification exercise was planned to be computerised but the Team had to alter this at a late stage. The paper-based exercise required reference to textbooks and did not have the same practical impact as other activities. The Team was delighted with the level of understanding and questions generated by students. During the mystery tablet exercise, some of the students recognised the condition being treated from the name of the identified tablets (e.g. Eplim®). Feedback was also extremely positive from teachers attending the workshops to supervise the students. The Team now need to investigate methods of determining the long-term impact on students’ career pathways.

Reference

10 Pharmacist contributions made on the acute medical wards

Reynolds S, Bracey G,
Charing Cross Hospital, Imperial College Healthcare Trust, London

Introduction
One of three pharmacists from the Pharmacy Admissions and Discharge (PAD) team at Charing Cross hospital will partake in the post-take ward round (PTWR) seven days a week, and provide ward services to the acute medical wards. The presence of a pharmacist on PTWRs has been shown to reduce prescribing errors, minimise unintentional omissions to drug histories, and minimise medication-related risk to patients.1,4 Accurate drug histories (DH) are important early on admission to ensure that patients continue important medicines during admission, to help identify any possible adverse drug reactions (ADRs), and to highlight any non-adherence to drug therapy. The importance of drug history taking has been highly publicised, and there are many papers highlighting the need for pharmacists to be involved with this process.4 The National Patient Safety Agency (NPSA) and National Institute for Health and Clinical Excellence (NICE) have recently published guidance on medicines reconciliation, which states that pharmacists should be involved in medication reconciliation as soon as possible after admission to hospital. Medication errors pose a threat of harm to hospital inpatients, leading to increased morbidity, mortality and economic burden to health services.

A previous audit at the Charing Cross Hospital reviewed the number and type of interventions made during the PTWR and on the acute medical wards, but did not assess the clinical significance of these contributions.7 The present study follows-on from the previous audit and will analyse clinical significance of interventions on the acute medicine wards.

Objectives
To document the number, types, and clinical significance of interventions made by the admissions pharmacists, both during the PTWR and while providing ward cover to acute medical patients on the two admissions wards, over a 7-day period.

Method
Three admissions pharmacists collected data over a 7-day period, recording all interventions made either on the PTWR, after clerking a DH, or to an existing patient on the ward. An intervention included anything recommended by a pharmacist, either in writing or verbally, whether it was accepted or not. After data collection the contributions were grouped and a representative list of 50 different interventions was produced. This list was sent to 9 healthcare professionals (doctors, nurses and pharmacists) and they were asked to grade them, with respect to patient harm caused if the intervention had not been made, on a scale of 1-10 (1 being not significant, 10 being extremely significant). The results from the 9 lists were averaged (mean) to give an overall grade for each intervention. These were then sorted into groups of minor (if scored <3 on the scale), moderate (4-7 on the scale) and major (>7 on the scale) interventions, depending on where the average answer lay, and all other contributions were classified into the same groups. Interventions were also classified into categories determining the different types of interventions made either on the PTWR, after clerking a DH, or to an existing patient on the ward.

Results
A total of 122 patients were seen and 194 interventions made; an average of 1.6 interventions per patient in total. Of these interventions, 44.3% (n=86) were made during the PTWR, 45.9% (n=89) were made after clerking a DH, 6.7% (n=13) were made on existing patients, and 3.1% (n=6) were made on new patients seen prior to the following day's PTWR. During the PTWR 86 interventions were made equating to 1.0 intervention per patient on the PTWR. As per previous literature the most common type of intervention from the PTWR was in the category of “therapeutic choice” (51.2%, n=44), which meant the pharmacist played an integral role in the prescribing of a medicine for a patient. The most common intervention made after a pharmacist had taken a drug history was recommending starting medicines which had been unintentionally omitted (71.9%, n=64). All of the interventions made by the pharmacists were considered to be of either moderate or major (66%, n=129 and 34%, n=65 respectively) significance. Pharmacists tended to rate the interventions of lower clinical significance than other healthcare professionals.

Discussion
A vast amount of interventions are made during the PTWR, showing that the pharmacist presence on the PTWR is of great value; in addition to providing a ward pharmacy service. Making one intervention per patient is comparable to previous studies,1,2 and the majority of these contributions fell into the category of “therapeutic choice” emphasising that pharmacists make significant contributions to patient care as they offer advise at the point of prescribing, thus reducing potential errors. As expected, the majority of interventions occurred after clerking a drug history with the main intervention being restarting a medicine which had been unintentionally omitted from the drug history on admission; these errors can follow the patient throughout their admission, either causing problems on discharge, or confusion in primary care if a GP is unsure why a medicine is not prescribed. The acute medicine pharmacist plays an integral role in reducing these omissions. The most common items unintentionally omitted were inhalers, eye-drops and bisphosphonates. Other healthcare professionals considered pharmacist interventions to be more clinically significant than pharmacists, highlighting that pharmacists input is appreciated and recognised. The fact that none of the interventions were considered minor is likely to be due to the subjective nature of the questionnaire/list.

Limitations - Ideally this study should be carried out for longer e.g. over 3–6 months, as seven days is only a short amount of time to data collect and does not reflect differences in the trends of patients seen over the year, or the differences in doctors present on the PTWR. Data collection
was time consuming; therefore there may have been fewer interventions made than normal, and due to the fast nature of the PTWR it is possible that some interventions may not have been recorded. Pharmacists were asked to record their own interventions, which may have resulted in researcher bias. The rating of clinical significance of the interventions was highly subjective, and dependent on the healthcare professionals’ own experiences.

Full time pharmacists on the admissions wards can reduce potential harm to patients from their medicines, reduce errors in drug histories, and possibly reduce prescribing costs by providing formulary advice.

References

Introduction
With one-stop dispensing and increasing use of automation within hospital dispensaries, medicines are routinely supplied in original packs, together with the relevant patient information leaflet (PIL). However in many wards, the PIL is locked away, within the bedside locker. PILs are regarded as a key resource for patients, but are thus unavailable to them at a time when changes to medicines, including the introduction of new medicines, are likely to occur. A recent in-patient survey identified that the majority of patients were given written or printed information about their medicine to take home with them,1 but did not determine the extent to which such information about medicines was provided during their stay. Directing patients to read their PILs during hospital stays may be of benefit in improving their understanding of medicines prior to discharge. A pilot scheme was therefore initiated on two wards within one acute trust to encourage the use of PILs by patients.

Objectives
- To determine the views of in-patients and staff on PILs and other information about medicines.
- To determine whether informing patients about the location of PILs increased their use during a hospital stay.

Methods
Four wards in Wirral University Teaching Hospitals NHS Foundation Trust (WUTH) were involved in the study, for which we were informed that ethics approval was not required. A novel “service” was introduced in two of the wards in November 2007. This involved the placement of laminated notices attached to all bedside lockers, informing patients that PILs were contained therein and advising them to ask staff for access. In addition staff pro-actively advised patients that they could read their PIL and ask if they wished to see it.

Two questionnaires were devised, one for patients and one for staff, to ascertain their views and practices concerning the provision of information about medicines during hospital admissions, including PILs. These were administered to staff and patients on all four wards during a four-week period in January/February 2008 using a face-to-face interview technique.

All patients admitted to all four wards during this period were screened by nursing staff for fitness to complete the interview. Those who were deemed fit were approached and the study explained using an information leaflet and consent obtained from those who agreed. All staff working on the wards at the time of the study were approached to participate, given an information leaflet and interviews conducted with those who consented.

Data were analysed using SPSS version 14. Chi-squared tests were used to determine whether differences existed between wards with the novel service and those without.

Results
A total of 213 out of 484 admitted patients were interviewed. The remainder were either deemed unfit by nursing staff or refused to participate. Fifty-four staff were interviewed.

Over three-quarters of patients (163; 76.5%) claimed that they normally read their PILs and a similar proportion (165; 77.5%) stated they preferred a combination of written and verbal information about medicines. 36 patients preferred verbal information alone. A large majority (187; 87.8%) agreed that they would read their PILs during their stay if given the chance to do so. Pharmacists were by far the most preferred staff to provide verbal information about medicines, selected by 180 participants (84.5%), followed by doctors (120; 56.3%), then nurses (90, 42.2%).

The majority of health professionals (44; 82%) thought PILs were useful sources of information and 46 (85%) thought patients should be directed to read them during hospital stays. They too felt that pharmacists were the most appropriate staff to convey verbal information (49; 91%), followed by doctors (40, 74%), then nurses (37; 69%).

However, when asked to assess the frequency with which they referred patients to PILs, only 25 (46%) stated that they did this, although 46 (85%) claimed they were asked questions about medicines at least once daily. Furthermore, only 57% of staff claimed to pro-actively ask patients if they required more information about medicines when prescribing, administering or supplying them.

More staff referred patients to PILs on wards where the policy was implemented compared to those which did not implement the policy (18/29 vs 7/25; p<0.05). Patients on the wards where reading PILs was encouraged were more likely to have been offered a chance to read them (34/108 vs 7/105; p<0.001), but did not ask questions about their medicines more often than those on wards where this was not encouraged (69/108 vs 78/105; p = NS).

Discussion
Although the public have been found to rate PILs as the third most useful source of information after doctors and pharmacists,2 MHRA encourages their use.3 Our study suggests that patients do tend to read them and would welcome the opportunity to do so during hospital admission. Hospital staff feel that PILs are useful, but in practice do not refer patients to them frequently. More respondents among both staff and patients in this study felt that pharmacists, more than doctors should provide information, in contrast to the above survey.2 Piloting a novel method of raising awareness of PILs appeared to have some impact on the frequency with which staff referred patients to them and patients read them. Further work is required to assess the benefits of PILs to hospital patients as part of the wider provision of information and to determine the most appropriate way of ensuring that they are accessible.

References
12 Developing Hospital Clinical Pharmacists’ ability to teach clinical pharmacy to undergraduate pharmacy students; a pharmacist ‘Train-the-Trainer’ programme


Introduction
A network of five hospital-based Teacher Practitioners (TPs) linked with Queens University in Belfast, Northern Ireland was established in October 2007. Prior to this date, undergraduate pharmacy students were limited to one or two half-day visits to a hospital in Level 4. The TPs ongoing responsibility is to design and develop a staged undergraduate clinical pharmacy programme for students from level 1 to 4 and to deliver this programme with the support of the Queens University (QUB) and the Clinical Pharmacists at the hospital sites. A range of staff from band 6 up to band 8b pharmacists are available at the various hospital sites to facilitate and guide student learning. Due to the wide variety of pharmacist experience and to ensure consistency of clinical pharmacy training across each site, the TP team along with colleagues from the school of pharmacy and the Centre for Education and Development (CED) at QUB, designed and delivered an introductory ‘Train-the-Trainer’ programme. The workshop was designed to be interactive and to stimulate discussion on various teaching methods as well as to introduce the clinical pharmacists to their role as ‘pharmacist tutor’ to the undergraduates and to provide detail of the upcoming Level 3 clinical placement.

Objectives
1. Identify and address key concerns of clinical pharmacists with regard to the provision of undergraduate teaching with an emphasis on clinical pharmacy skills.
2. Provide training for clinical pharmacists to develop teaching and facilitation skills to enable them to enhance the student learning experience.
3. Provide detail of the level 3 clinical placement.

Method
All of the clinical pharmacists in each of the hospital sites (129) were invited to attend the ‘Train the Trainers’ course, which was run over five separate afternoons in late November and early December 2007. The course facilitators initially invited the clinical pharmacists to raise any concerns they had in relation to teaching and facilitation of student learning. They then proceeded to outline the remit of the course and what would be addressed in the session. The three hour workshop was divided up into:

- An initial PowerPoint presentation by the TP and school of pharmacy staff which addressed the role of the pharmacist tutor during the undergraduate student’s clinical visit at the hospital site. That is, to integrate the student’s knowledge of the pathophysiology of disease as well as medicines use with the development of new clinical skills such as drug history taking, development of pharmaceutical care plans and patient counselling. The role of the pharmacist tutor in relation to grading of student work and professional behaviour was also discussed.
- A session on ‘helping students to learn’, which encompassed small group teaching, listening skills, questioning students, encouraging student participation as well as providing feedback.
- Examples of good and bad teaching and facilitation, delivered via a range of multimedia resources including video examples.
- Two role play exercises to highlight ‘explaining technical information’. The pharmacists were divided into groups of two and allocated a role of either pharmacist or pharmacy student. The pharmacist was then asked to describe how to undertake a clinical pharmacy skill e.g. a drug history or counselling a patient on a new drug to the undergraduate pharmacy student. The roles were then reversed.

The sessions were evaluated via an evaluation form given to all attendees. A ‘debriefing’ session was also conducted with the course facilitators from the Centre for Education and Development and the School of Pharmacy, QUB.

Results
The ‘Train-the-Trainer’ programme was delivered five times to a total of 119 pharmacists (92% of the available pharmacists) from all four of the hospitals involved. A total of 49 pharmacists completed the evaluation form (response rate 41%).

The clinical pharmacists had a wide range of objectives for attending the course, from learning about:

1. Their role as a pharmacist tutor (35%) e.g. ‘identify my role in educating students’
2. Teaching tips (32%) e.g. ‘to provide better training and more effective ways of training students’, ‘what facilitates and improves learning’, ‘to know how much to help students – to challenge them but not overtax or spoon-feed them’
3. Development of communication skills with students (19%) e.g. ‘level of information to provide’, ‘how to ensure students participate in the discussion’, ‘how to present information to students in a way they would understand’
4. Content of placement (10%)”}

Discussion
The workshop met its objectives in relation to providing support to clinical pharmacist involved in the teaching of pharmacy undergraduates and pharmacists appreciated the multidisciplinary approach of the program. The ‘Train the Trainers’ model has been frequently used in the education of healthcare professionals and this approach has been shown to increase the self-assessed ability of professionals to teach. Clinical pharmacists preferred the interactive aspects of the workshop, especially the role-plays. As a result of this the TP team followed up this introductory session with local, hospital based sessions on bedside teaching methods to build on lessons learnt during this workshop. Most attendees (63%) felt they would not want anything extra covered in this session but some felt some more emphasis on teaching skills in relation to student feedback and disciplining of problem students would be valuable, we will consider this for future sessions.

Reference
Provision of pharmacy service to the Critical Care Outreach Team: targeting pharmacy resources to acutely ill patients

Bell T and Seddon S
Sherwood Forest Hospitals NHS Foundation Trust, Nottinghamshire

Introduction
Critical Care Outreach Services have developed nationally to provide a high standard of care to acutely ill patients based on an assessment of need for care. This is achieved through a multidisciplinary approach to identify, assess and provide care for at risk patients. Whilst level two and three patients would be reviewed by a critical care trained pharmacist on the Integrated Critical Care Unit (ICCU); a diverse skill mix of pharmacists unlikely to be trained in critical care could review a level one patient.

To overcome this, a service model was proposed for a critical care trained pharmacist to attend the Critical Care Outreach Team (CCORT) nursing handover to identify acutely ill patients and provide a clinical pharmacy review of their management. Outside of this handover period a named contact would be available for the CCORT nurses to refer problem patients.

The patient groups that were identified as most likely to benefit from a pharmacy review included the following:

- Polypharmacy patients (more than five medications)
- Patients with low blood pressure on cardiac medication
- Patients with route of administration issues
- Patients with reduced urine output/acute renal failure
- Patients with suspected adverse drug reactions
- Patients with active or suspected infections – advise on choice and management of antibiotics

The CCORT pharmacist would visit all “step-down” patients following discharge from the integrated critical care unit (ICCU) to allow appropriate transition of pharmacy care and provide support to the ward pharmacist.

Objective
A new patient-focused pharmacy service working alongside the CCORT was introduced as an initial six-month pilot. The purpose of this study was to assess the impact of this service on patient care (in terms of clinical interventions made).

Method
The six-month pilot was run from November 2007 with the CCORT pharmacist assigned 1.5 hours per day. This time would be used to attend the CCORT nursing handover, allowing identification of any patients who may benefit from pharmacy input. The CCORT would then visit these patients in addition to any patients discharged from ICU. The CCORT pharmacist would perform a clinical screen of the current medication and advise on management as appropriate.

To ensure this work was not duplicated the CCORT pharmacist would then inform the ward pharmacist of the visit and advise whether the patient would remain under their care or transfer back to the ward pharmacist. In the case of patients transferred from ICU the pharmacist would visit to ensure all medication being used was appropriate to the ward environment and provide a handover to the ward pharmacist of any ongoing issues or monitoring. The CCORT pharmacist would then be available to support the ward pharmacist in the care of this patient as appropriate.

Table 1: Distribution of interventions by severity grading

<table>
<thead>
<tr>
<th>Severity grading</th>
<th>Number of Interventions (percentage of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>49 (40.8%)</td>
</tr>
<tr>
<td>Moderate</td>
<td>56 (48.3%)</td>
</tr>
<tr>
<td>Major</td>
<td>13 (10.8%)</td>
</tr>
</tbody>
</table>

Data was collected regarding the type and severity of intervention performed one each patient and graded according to the Sherwood Forest NHS Foundation Trust interventions grading scale. In addition to this feedback was collected from the nursing and pharmacy staff involved in the pilot via questionnaires.

Results
In the six-month data collection period 200 patients were referred to the CCORT nurses. Of this group 131 were discussed or seen by the CCORT pharmacist. In total 120 interventions were made in 59 patients (Table 1).

Discussion
The CCORT pharmacist has been shown to continually make clinically significant interventions within a patient group at high risk of drug related adverse effects. This data has been supported by the verbal feedback both from the pharmacists involved and the CCORT nurses citing the scheme as an improvement in the standard of care of critically ill patients.

A key feature of this scheme has been a shift in the point at which the intervention is made away from the reactive model of traditional pharmacy services to a more proactive intervention based model. By becoming more aware of the acutely ill patients the pharmacist can make themselves available to advise at the point of prescribing ensuring medication choice and dosing is appropriate for the patient before it is given. By reviewing ICU “step-down” patients the pharmacist is also ensuring transition of pharmaceutical care in support of NICE guidelines for treatment of acutely ill patients and providing support to ward based pharmacy staff. This support came both in the form of the clinical review of the patient and also utilising the acutely ill patients as teaching cases for band 6 pharmacists on the ward.

The only disadvantage raised by the review of the scheme was the pharmacist time required but considering the data showed the CCORT pharmacist made an intervention in every 2.2 patients seen, averaging two interventions in each of these patients this suggest a patient group at high risk of adverse drug-related events would justify the time invested.

Recommendations for the continuation of a pharmacy service to the CCORT

1. Continue the CCORT service alongside enhanced surgery service to reduce impact on departmental services.
2. Improved handover between CCORT pharmacist and ward pharmacist to avoid duplication of work.
3. Critical care training for sufficient pharmacists to provide ongoing cover to service.
4. Intensive data collection periods every six months to show continuing benefit of providing this service.

References
1. Department of Health; Comprehensive Critical Care: A review of adult critical care services; May 2000 accessed at www.dh.gov.uk on 05/05/08.
3. Department of Health; Adult Critical Care: Specialist Pharmacy Practice; June 2005 accessed at www.dh.gov.uk on 05/05/08.
Reduction of Clostridium difficile in a general hospital by implementation of antibiotic guidelines

Buckinghamshire Hospitals NHS Trust

Background
While Clostridium difficile is not a new problem in hospital treated patients, the emergence of a more virulent strain of C difficile has caused increased mortality and morbidity in previous years, particularly at Stoke Mandeville Hospital, Buckinghamshire Hospitals NHS Trust. There were two large outbreaks of C difficile at Stoke Mandeville Hospital. The first outbreak occurred between October 2003 and June 2004 and resulted in 174 cases of C difficile. 19 deaths occurred that could probably be attributed to C difficile. The second hospital wide outbreak occurred between October 2004 and June 2005. There were 160 new cases and 19 further deaths among patients that were attributed to C difficile.

The infection control and microbiology teams recognised the need to make changes in practice to reduce the level of C difficile infection in the hospital. Several factors were identified to contribute to C difficile infection, one of which is antibiotic use. Broad spectrum antibiotics e.g. ciprofloxacin, cephradine are known to be factors in the emergence of C difficile associated diarrhoea within healthcare trusts. Prudent use of antibiotics and limiting use of broad spectrum antibiotics within healthcare settings could result in a reduction in C difficile associated diarrhoea.

Aim
The primary aim was to reduce the incidence of C difficile associated diarrhoea with the prudent use of antibiotics.

Objectives
● To describe a method of controlling antibiotic use which has contributed to lower rates of C difficile.
● To describe staff acceptability to the restriction methods employed.

Methods
The Antibiotic Review Group developed new guidelines in February 2004 to restrict the use of broad spectrum antibiotics within the Trust. These guidelines restricted the use of cephalosporins, co-amoxiclav and quinolones within Stoke Mandeville hospital. However, despite implementation of the guidelines, the restricted antibiotics continued to be used throughout the hospital (as many were held as ward stock despite the restrictions).

The decision was then made by microbiology and pharmacy to remove all broad spectrum antibiotics physically from the wards and departments to prevent the ad-hoc use of these antimicrobials.

In 2005, a flashcard containing the main guidelines for use of antimicrobials was launched in Buckinghamshire Hospitals NHS Trust. As Buckinghamshire Hospitals NHS Trust is made up of three separate hospitals (Wycombe Hospital, Amersham Hospital and Stoke Mandeville Hospital) where C difficile rates differed, separate guidelines were drawn up depending on the risk of C difficile. The guidelines were more restrictive for Stoke Mandeville Hospital where the C difficile rates were high compared to Wycombe Hospital where rates of C difficile were lower. For the areas where C difficile infection was particularly high, the use of cephalosporins, ciprofloxacin and co-amoxiclav was prohibited and alternative antibiotics that are not known to be associated with C difficile were advised.

Staff concerns and attitudes at the time of implementation were measured and compared to current concerns and attitudes to our policy.

Results
The initial guidance for the voluntary restriction of antibiotics as suggested by the Antibiotic Review Group was unsuccessful as the guidelines were not always followed and the restricted antibiotics were still available in the wards and departments.

When the restricted antibiotics were physically removed from the medical wards, there was a dramatic improvement in the C difficile infection rate. At point A (Feb 2004), amoxicillin, cefuroxime, clindamycin and co-amoxiclav were withdrawn from the medical wards. The rate of C difficile fell significantly until October 2004 when it began to rise again. In April 2005 (B), ciprofloxacin was withdrawn from the medical wards resulting in another fall of C difficile rates within the hospital. At point C the restrictions were also applied to the surgical wards resulting in a bigger drop in cases. Since this implementation, the number of C difficile cases has been low and the Trust is currently under the national trajectory for C difficile as well as having the lowest rates of C difficile in the south-east of England.

Staff were initially resistant to the changes but now accept the restrictions as normal.

Discussion
There is evidence that broad spectrum antibiotics such as cephalosporins, fluoroquinolones and penicillins can cause C difficile infection and these were the agents that were restricted at Stoke Mandeville Hospital.

It can be seen from the results that there has been a dramatic reduction in the incidence of C difficile associated diarrhoea within Buckinghamshire Hospitals NHS Trust. This decrease in C difficile cases was multifactorial but the restriction of broad spectrum antibiotics within the Trust was considered to be an important contributory factor.

The physical removal of the antibiotics from the departments and wards was the key to the success of the antibiotic restrictions that were put into place. Medical staff now have to obtain microbiology approval before ordering restricted antibiotics from pharmacy.

Staff were initially very resistant to the physical removal of restricted antibiotics from the wards; however over time, it became accepted practice.

The development of the flashcard for use within the Trust also contributed largely to the success of the guidelines proposed. Large versions of the flashcard are available on all the wards and departments and they help nurses, pharmacists and doctors to ensure that prescribing of antibiotics is appropriate. The flashcard is also available in a pocket size permitting doctors and pharmacists to carry them around with ease and refer to them when appropriate.

References
1 Investigation into outbreaks of Clostridium difficile at Stoke Mandeville Hospital, Buckinghamshire Hospitals NHS Trust. Healthcare Commission, July 2006
Introducing educational and interventional pharmaceutical measures to help reduce hospital-acquired Clostridium difficile infections at the Luton and Dunstable Hospital

Hudson LD, Mulla R, Evans M and Grierson-Hill D
Luton & Dunstable Hospital NHS Foundation Trust (L&D)

Introduction
The Health Protection Agency’s Mandatory Surveillance of Healthcare Associated Infection reports had shown the L&D to have Clostridium difficile (C difficile) infection rates consistently higher than the national average. Various Department of Health publications have described the importance of prudent antibiotic prescribing in reducing the prevalence of C difficile; a pivotal publication was the letter from the Chief Officers in December 2006. This letter highlighted the importance of reducing patient’s exposure to antibiotics through reduced course durations, more appropriate agent selection and the letter specifically advocated restricting the use of broad spectrum antibiotics, in particular the cephalosporins and the quinolones.

A “No Avoidable Infections” strategy was introduced at the L&D to address the higher than average incidence of C difficile, its recommendations being implemented in August 2007. This strategy covered all aspects of reducing C difficile infections, including Infection Control, Domestic Services and Pharmacy. Significant resources were allocated to train ward staff in Infection Control procedures, introduce hypochlorite cleaning solution and improve cleaning procedures, continue the ongoing “cleanyourhands” campaign and build four new side rooms in the hospital. The pharmaceutical measures implemented are detailed in the “Method” section below. The fact that many measures were implemented simultaneously means that establishing the relative contribution of each measure is problematic; however as a whole the bundle of measures has proven effective.

Objective
To measure the impact of the educational and interventional approach implemented in order to improve antibiotic prescribing and therefore contribute to reducing C difficile infections at the L&D.

Method
An educational and interventional approach was initially adopted since this approach has been proven to be more effective than more authoritarian measures. Care of the Elderly, Medicine and General Surgery Directorate patients have consistently accounted for 90-100% of C difficile cases at the L&D and therefore available pharmacy resources were focussed on these three directorates.

The pharmaceutical measures implemented during August 2007 were:

1. Antibiotic ward rounds performed by the Consultant Microbiologist and the Antibiotic Pharmacist in order to promote up-to-date prudent antibiotic prescribing.
2. The launch of “Antibiotic Referral Cards” for ward-based pharmacists to refer all patients prescribed cephalosporins or quinolones to the Antibiotic Pharmacist for review.
3. The Trust Antibiotic Guidelines were updated and made available on the intranet.
4. Handheld Empirical Antibiotic Guidelines were developed and distributed to all doctors.
5. An Antibiotic Stop Protocol, monitored by ward based pharmacists, was introduced to reduce exposure of patients to antibiotics. A sticker is attached to drug charts when antibiotics are prescribed, reminding prescribers to specify the intended duration. If the duration is not specified after five days then the prescription is stopped and the prescribing team is informed.
6. Directorate tracker charts, illustrating the reduction in usage of cephalosporins and quinolones against the reduction of C difficile infections, were circulated on a monthly basis.

Following the groundwork and success of this educational and interventional approach, cephalosporins and quinolones were removed from ward stock on Care of the Elderly wards in November 2007 and from Medicine and General Surgery wards in December 2007.

Results
Figure 1 shows the incidence of C difficile infections at the L&D between November 2005 and June 2008 inclusive. It can be seen that implementing the above described measures in August 2007 appears to have had an immediate effect, with the number of new C difficile infections dropping to less than 20 per month, for the first time, in August 2007. A “mini-cluster” in October 2008 caused an acute rise in C difficile infections in that month. Since removing ward stocks of cephalosporins and quinolones between November and December 2007, the number of C difficile infections has been consistently less than ten per month.

Discussion and conclusions
Figure 1 clearly illustrates the reduction in C difficile infection rates at the L&D with the number of infections dropping by 75% from 24 cases in July 2007 to six cases in June 2008. Implementing the local “No Avoidable Infections” strategy, which encompassed recommendations from Department of Health publications, appears to have been effective. Due to the nature of implementing a bundle of measures simultaneously, attributing success to individual measures proves challenging.

It seems reasonable to conclude that the bundle of measures implemented in August 2007 was successful. Removing cephalosporins and quinolones from ward stock between November and December 2007 capitalised on the groundwork and success of these educational and interventional measures. We therefore recommend that the bundle of measures used with success at the L&D are utilised by other hospitals that are seeking to reduce their C difficile rates, followed by the removal of ward stocks of cephalosporins and quinolones.

References
Reducing the risks associated with look-alike, sound-alike drugs

Owensby J*, Franklin BD**, Chan M**
*UNC Chapel Hill School of Pharmacy, North Carolina, **Centre for Medication Safety and Service Quality, Imperial College Healthcare NHS Trust and The School of Pharmacy, University of London

Introduction
Medication names that either look or sound similar often cause confusion and can lead to patient harm or even death. Over 1,400 commonly used medications are involved in such errors, according to results released from the United States Pharmacopeia (USP) in January 2008.

Objectives
(1) To review existing guidance and processes in the United States (US) and United Kingdom (UK) for reducing the risks associated with look alike sound alike (LASA) drugs.
(2) To review Trust medication incident reports associated with LASA drugs (since Datix installed 2006).
(3) To compare error rates from the literature with those from local medication incident reports. To make recommendations based on findings for reducing the risks associated with LASA drugs.

Methods
Two-part study: (1) A literature review was conducted to identify and compare existing guidance for reducing LASA associated medication errors in the US and UK. A PubMed literature search included the terms medication, error, look-alike, sound-alike, drug, UK, London, England and US. (2) LASA medication errors were reviewed at Charing Cross (CCH) and Hammersmith Hospitals (HH). All available medication incident reports from Datix (February 2006 to March 2008) were reviewed to identify errors attributable to LASA medications. Internal pharmacy dispensing error reports for CCH and HH (September 2005 to February 2008) were also reviewed to maximise data captured. The results were then analysed for trends, compared with the findings from the literature and areas identified for future improvement.

Results
(1) Literature review: Organisations in the US and the UK have developed guidelines for pharmaceutical companies to reduce LASA medication errors. These guidelines include regulation of the naming process of medications, as well as the formatting of packaging e.g. the World Health Organisation’s International Non-proprietary Names (INN) Expert Group works to develop generic names that will be accepted worldwide. The Food and Drug Association in the US and the Invented Names Review Group in the European Union regulate brand names to avoid names which may be confused with existing medications. The British Pharmacopoeia Commission collaborates with INN to create a list of British Approved Names (BAN). In the US, the Institute for Safe Medication Practices (ISMP) and The Joint Commission on Accreditation of Healthcare Organisations (JCAHO) each have extensive lists of confused drugs names whereas in the UK, only one limited list was identified which was from the National Patient Safety Agency (NPSA) table 1(A). In addition, JCAHO – which is responsible for accreditation of healthcare organisations in US - established a set of National Patient Safety Goals, one of which specified that each accredited organisation should create and maintain a list of LASA drugs locally. There is no similar guidance in the UK although the NPSA has recognised this as a problem.
(2) Local LASA associated medication error reports. A total of 118 (9%) LASA associated medication errors were identified from 1345 medication incident reports from Datix and internal dispensing error reports. Thirteen of these occurred more than once and six medication pairs were confused more than twice, table 1(B). Sub-analysis of the Datix medication incidents revealed that out of 722 medication administration errors, 35 (5%) were found to be caused by LASA drugs. Nine (4%) of 257 prescribing errors and 41 (24%) of 171 preparation errors were attributed to LASA medications.

Discussion
Various guidelines were found in the literature which included methods to reduce risks associated with LASA drugs, particularly in the US. From the Datix database, 85 (7.4%) of 1150 total reported errors (administration, prescribing, and preparation combined) were deemed attributable to LASA medications. This is significantly lower than the US Pharmacopoeia’s reported 15% of documented medication errors that were caused by similar drug names. Whether this is due to differences in reporting between the US and UK, or if it actually indicates that LASA medication errors are less problematic in the UK is unknown. The majority of the LASA drug errors from Datix were associated with an error in the preparation process. This is not unexpected as similar packaging and storage location have been considered contributory factors for LASA drug errors and the opportunity for these types of errors do mainly occur during the preparation process. It is interesting that none of these medications are included in the list created by the NPSA, table 1(A). This reinforces the importance of analysing local data when implementing methods to decrease the amount of LASA medication errors. The Trust is now looking into the possibility of creating and reviewing a local list of LASA drugs as targets for risk reduction. Other recommendations include altering the appearance of LASA medication names on computers, storage areas, product labels using bold face, colour, or tall man letters to emphasise the part of the name that is different (i.e. hydrOXYzine, hydrALAzine). In addition, medication incident reporting should be encouraged and promoted in order to capture a more realistic picture of the problem LASA drugs.

Table 1. List of LASA drugs from NPSA and from local dat

<table>
<thead>
<tr>
<th>(A) NPSA list Drug 1</th>
<th>(B) Top LASA drugs from CCH and HH Medication 1</th>
<th>Medication 2</th>
<th>No. of reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenaline Novomix</td>
<td>Amiodarone Novopapid</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Amiodarone Allopurinol</td>
<td>Oxytocin Oxyxorn</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Bisacodyl Bisoprolol</td>
<td>Calcium D3 Calcium D3 forte</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Cefotaxime Cefuroxime</td>
<td>Mixtard Novoxim</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Hydroxyzine Hydralazine</td>
<td>Sando K Phosphate sandoz</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Morphine Diamorphine</td>
<td>Imipenem Meropenem</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Prostacyclin Protaglandin</td>
<td>Amoxicillin Flucloxacillin</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Vinblastine Vincristine</td>
<td>Calcichew D3 Calcichew</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fentanyl</td>
<td>Morphine</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Morphine sulphate MR (MST)</td>
<td>Morphine Sulphate (Severdol)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Morphine sulphate MR (MST)</td>
<td>Morphine Sulphate (Severdol)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>Oxybutynin MR</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Xalacom Xalatan</td>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

References
Provision of osteoporosis prophylaxis for users of intermittent oral corticosteroid and high-dose inhaled corticosteroids

Williams N and Hodson KL
Welsh School of Pharmacy, Cardiff University

Introduction
Royal College of Physicians (RCP) guidelines only exist for the provision of osteoporosis prophylaxis in users of continuous oral corticosteroids (COC). According to these guidelines, there is no safe dose of COC and fracture risk should be evaluated in all individuals using them. Recent evidence suggests that users of intermittent oral corticosteroids (IOC) and high-dose inhaled corticosteroids (HIC) are also at increased fracture risk. Table 1 shows the relative fracture risks in these groups are similar to patients taking COC at daily doses of 2.5-7.5mg/day (where osteoporosis prophylaxis (OP) should be considered).

For the purpose of the audit, frequent use of IOCs or long-term use of HICs was considered to be equivalent in terms of fracture risk to intermediate-dose COCs. Audit standards were adapted from the RCP guidelines for COCs, where osteoporosis prophylaxis should be considered in patients aged over 65 years, and those under 65 years if they have a previous fragility fracture or low BMD (T-score ≤-1.5). Adherence to standards was 100%.

Objectives
The objective was to retrospectively audit practice at a General Practice Medical Centre to determine whether patients aged over 18 years using frequent IOCs (≥3 or more courses/year or a cumulative dose of ≥1gram prednisolone) or long-term HICs (≥2800mg/day for at least 2 years) are receiving appropriate osteoporosis prophylaxis.

Method
Data was collected over a 6-week period during February to March 2008. Patients were identified using the search facility on the GP Vision computer system. The Practice records were reviewed (both paper and electronic) and information was collected on: details of corticosteroid usage; osteoporosis prophylaxis prescribed; bone densitometry tests (DEXA scans); additional risk factors for osteoporosis and lifestyle advice given. Analysis was completed using Statistical Package for Social Sciences.

Results
In total 98 patients were identified. The demographics of the two groups are shown in table 2. In the IOC group the mean number of prednisolone prescriptions were shown in table 2.

In total 98 patients were identified. The demographics of the two groups are shown in table 2.

The objective was to retrospectively audit practice at a General Practice Medical Centre to determine whether patients aged over 18 years using frequent IOCs (≥3 or more courses/year or a cumulative dose of ≥1gram prednisolone) or long-term HICs (≥2800mg/day for at least 2 years) are receiving appropriate osteoporosis prophylaxis.

Introduction
Royal College of Physicians (RCP) guidelines only exist for the provision of osteoporosis prophylaxis in users of continuous oral corticosteroids (COC). According to these guidelines, there is no safe dose of COC and fracture risk should be evaluated in all individuals using them. Recent evidence suggests that users of intermittent oral corticosteroids (IOC) and high-dose inhaled corticosteroids (HIC) are also at increased fracture risk. Table 1 shows the relative fracture risks in these groups are similar to patients taking COC at daily doses of 2.5-7.5mg/day (where osteoporosis prophylaxis (OP) should be considered).

For the purpose of the audit, frequent use of IOCs or long-term use of HICs was considered to be equivalent in terms of fracture risk to intermediate-dose COCs. Audit standards were adapted from the RCP guidelines for COCs, where osteoporosis prophylaxis should be considered in patients aged over 65 years, and those under 65 years if they have a previous fragility fracture or low BMD (T-score ≤-1.5). Adherence to standards was 100%.

Objectives
The objective was to retrospectively audit practice at a General Practice Medical Centre to determine whether patients aged over 18 years using frequent IOCs (≥3 or more courses/year or a cumulative dose of ≥1gram prednisolone) or long-term HICs (≥2800mg/day for at least 2 years) are receiving appropriate osteoporosis prophylaxis.

Method
Data was collected over a 6-week period during February to March 2008. Patients were identified using the search facility on the GP Vision computer system. The Practice records were reviewed (both paper and electronic) and information was collected on: details of corticosteroid usage; osteoporosis prophylaxis prescribed; bone densitometry tests (DEXA scans); additional risk factors for osteoporosis and lifestyle advice given. Analysis was completed using Statistical Package for Social Sciences.

Results
In total 98 patients were identified. The demographics of the two groups are shown in table 2.

Table 1: The relative risks of fracture in patients using COC2, IOC3 and HIC4

<table>
<thead>
<tr>
<th>Site</th>
<th>COC: daily dose of prednisolone/mg</th>
<th>IOC: prednisolone cumulative dose/g</th>
<th>HIC: cumulative dose/g</th>
<th>Inhaled corticosteroids: daily dose/mcg</th>
<th>Inhaled corticosteroids: daily dose/mcg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>≤2.5</td>
<td>&gt;2.5</td>
<td>≤7.5</td>
<td>&gt;7.5</td>
<td>≤150</td>
</tr>
<tr>
<td>Hip</td>
<td>0.99</td>
<td>1.77</td>
<td>2.27</td>
<td>0.79</td>
<td>1.64</td>
</tr>
<tr>
<td>Vertebral</td>
<td>1.55</td>
<td>2.59</td>
<td>5.18</td>
<td>1.38</td>
<td>8.12</td>
</tr>
</tbody>
</table>

Table 2: Patient demographics

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Male</th>
<th>Female</th>
<th>Average age</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOC</td>
<td>31</td>
<td>3</td>
<td>28</td>
<td>53 years</td>
</tr>
<tr>
<td>COC</td>
<td>67</td>
<td>34</td>
<td>33</td>
<td>62 years</td>
</tr>
</tbody>
</table>

Table 3: Results of the audit

<table>
<thead>
<tr>
<th>Group</th>
<th>Adherence (%)</th>
<th>U56 &amp; risk factor</th>
<th>DEXA</th>
<th>U56 &amp; no risk factor</th>
<th>DEXA</th>
<th>O05 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOC</td>
<td>30 (32%)</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>HIC</td>
<td>15 (22%)</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>27</td>
<td>9</td>
</tr>
</tbody>
</table>

* both had low BMD and were given treatment;  one showed low BMD and was given treatment.

A direction was “30mg for 5 days” (N=47/119). The mean cumulative dose was 940mg of prednisolone per year; range 450-2250mg. Twelve people (38.7%, N=31) had a cumulative dose of ≥10g of prednisolone over the year. Fifteen patients (48% N=31) were also using inhaled corticosteroids. In the HIC group, the most common reason for use was asthma (61%, N=67) and the most common inhaler type was fluticasone (66% N=67). The mean current daily dose of corticosteroid inhalers was 1031mcg (SD 395.890). The highest daily dose was 4000mcg. The mean duration of use was 5.1 years (SD 2.945). Table 3 shows the audit results.

In both groups the most common prophylactic treatment was alendronate 70mg once weekly (70% N=23). Four patients (17%, N=31) appear to have stopped requesting repeat prescriptions for their osteoporosis prophylaxis. The majority of people (60% N=5) who were given a DEXA scan were subsequently diagnosed with osteoporosis (T-score of ≤-2). Evidence of lifestyle advice being given to patients was found in 44% (N=98) of records.

Discussion
Adherence to audit standards was low. It appears that DEXA scans are not used proactively as the majority of scans subsequently diagnosed patients with osteoporosis. A recommendation would therefore be to use DEXA scans early and before BMD becomes substantially low. As documented lifestyle advice is low, a recommendation to the Medical Centre is to encourage all patients to proactively alter their modifiable risk factors by providing appropriate lifestyle advice.

It is interesting that the most common bisphosphonate regimens were once weekly, despite these not being a licensed dose for corticosteroid-induced osteoporosis prophylaxis. Also, in the IOC group, the most common direction was “prednisolone 30mg for 5 days”, despite the recommended dose for acute asthma being 40-30mg for 5 days. This suggests that the guidelines for asthma are not being followed. A recommendation would be that the General Practitioners (GP’s) should be aware of guidelines for the treatment of acute respiratory diseases to ensure optimal patient care. Additionally, just under half of these patients were also on inhaled corticosteroids (N=15/31 patients) despite the majority suffering respiratory disease, suggesting their use as prophylactic treatment may be sub optimal. A recommendation to the Practice would be to review the patient’s chronic disease management with an aim to reduce the need for acute courses of prednisolone.

The Medical Centre failed to meet audit standards, however less is known about the risks in these groups compared to COC usage. Adherence to guidelines in the HIC group was higher than in a similar study (1.7%). It is recommended that the Medical Centre establishes interim guidelines until National guidelines are published and re-audit when these are in place.

References
An audit of the prescribing practice for corticosteroid-induced osteoporosis at a general practice medical centre

Williams N and Hodson KL
Welsh School of Pharmacy, Cardiff University

Introduction
Corticosteroid-induced osteoporosis is the most common form of secondary osteoporosis. It is estimated that 350,000 individuals are at risk of developing corticosteroid-induced fractures in the United Kingdom (UK) and the vast majority have not been evaluated for osteoporosis risk. The Royal College of Physicians (RCP) guidelines exist for the provision of osteoporosis prophylaxis in users of long-term oral corticosteroids. According to these guidelines, as there appears to be no safe dose of corticosteroids, physicians should evaluate fracture risk in all individuals. Osteoporosis prophylaxis should be considered in all patients aged over 65 years, and those under 65 years if they have a previous fragility fracture or low BMD (T-score –1.5 or below). The General Practice Medical Centre recognised the need to audit their practice against guidelines. Adherence to guidelines was set at 100%.

Objectives
The objective was to retrospectively audit practice to determine if patients over 18 years using continuous oral corticosteroids are receiving appropriate osteoporosis prophylaxis as per RCP guidelines.

Method
Data was collected over a 6-week period during February to March 2008. All patients with a repeat prescription of a corticosteroid issued during the last three months were identified using the search facility on the GP Vision computer system. Patients using corticosteroids as replacement therapy were excluded. The Practice records were reviewed (both paper and electronic) and information was collected on: details of corticosteroid usage; osteoporosis prophylaxis prescribed; bone densitometry tests (DEXA scans); additional risk factors for osteoporosis and lifestyle advice given. Analysis was completed using Statistical Package for Social Sciences.

Results
Forty-eight patients (31 female and 17 male) were identified, with a mean age of 71 years (SD 15.67). All patients were prescribed prednisolone, the most common reason for use being rheumatic disease (58%, N=28/48). Table 1 shows the prescribed current daily dose and dose on initiation. The mean duration of use was 41 months (SD 46.81, range 2-176).

Adherence to RCP guidelines was 89% (N=40/45, 3 people were excluded as they had been on continuous corticosteroids for less that 3 months and no information was available to indicate whether they were expecting to continue the treatment long-term). Ten people were aged under 65 years. Of these, six were prescribed osteoporosis prophylaxis because they had a strong risk factor for osteoporosis and two were prescribed prophylaxis after a DEXA scan showed a T-score of < 1.5. The remaining 2 people aged under 65 years were not given a DEXA scan when one was indicated. Thirty-five people were aged over 65 years, of which 32 people were given treatment as suggested by the RCP guidelines. The remaining 3 people were not considered for treatment.

Discussion
Forty-eight patients were identified, amounting to 0.48% of the total population registered at the Medical Centre. The patient demographics reflect the fact that rheumatic conditions affect more females than males, and prevalence increases with increasing age, thus it was expected that the population would predominantly be elderly (mean age 71 years). The mean starting daily dose of prednisolone was double the mean current daily dose (16.1mg compared to 7.8mg), showing a high dose is prescribed initially and reduced according to response. The mean duration of usage reflects the chronic conditions being treated.

Adherence to guidelines was high (89% N=45) but failed to meet audit standards. However, the results are better than a recently published audit, which reported 69% adherence. The results show a proactive
approach as prophylaxis is usually started early and is especially important given the greatest loss of bone occurs in the first 6-12 months of corticosteroid treatment. The most common bisphosphonate regimens were once weekly, despite these not being a licensed dose for corticosteroid-induced osteoporosis prophylaxis. However, once weekly drugs have higher convenience and patient persistence. Despite this, the results still possibly indicate poor persistence with treatment. Documented lifestyle advice is low (35% N=48), however lifestyle advice may be given but not documented.

This audit demonstrates that the standard of current practice is high, however it could be improved further. It is recommended that all General Practitioners at the Medical Centre be aware of the RCP guidelines and consider osteoporosis prophylaxis as soon as corticosteroid treatment begins. A re-audit is planned for 2009.

References
4 Rossini, M., Bianchi, G., Di Munno, O. et al. Determinants of adherence to osteoporosis treatment in clinical practice. Osteoporos Int, 2006, 17, 914-921

Table 1: NPSA risk assessment score for the preparation of doses observed

<table>
<thead>
<tr>
<th>Red Drugs</th>
<th>Amber Drugs</th>
<th>Green Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of total</td>
<td>Red Drugs</td>
<td>Amber Drugs</td>
</tr>
<tr>
<td>0.8% (1/126)</td>
<td>Insulin sliding scale (6 out of 8 potential risk factors)</td>
<td>Bupivacaine epidural bolus</td>
</tr>
<tr>
<td>22.2% (28/126)</td>
<td>Diamorphine spinal inj</td>
<td>Oxycodone PCA</td>
</tr>
<tr>
<td>76% (97/126)</td>
<td>GTN infusion</td>
<td>Midazolam bolus</td>
</tr>
</tbody>
</table>

Table 2: Non compliance with NPSA SOP for preparation of IV medication

<table>
<thead>
<tr>
<th>Non compliance with SOP Audit Standard</th>
<th>% of doses prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not prescribed on chart</td>
<td>79% (100/126)</td>
</tr>
<tr>
<td>No independent second check performed</td>
<td>79% (100/126)</td>
</tr>
<tr>
<td>No labelled concentration</td>
<td>74% (93/126)</td>
</tr>
<tr>
<td>No line flushed (if appropriate)</td>
<td>48% (60/126)</td>
</tr>
<tr>
<td>Prepared in advance</td>
<td>26% (70/126)</td>
</tr>
<tr>
<td>Not drawn up and given by same person</td>
<td>21% (26/126)</td>
</tr>
<tr>
<td>No labelled drug name</td>
<td>11% (14/126)</td>
</tr>
</tbody>
</table>

Results
The preparation of 126 doses of 40 different individual medicines was assessed. Seventeen patient cases were observed with a mean of 7.4 doses per case (median score=8 doses per case). The average NPSA risk score was 1.8 (range 0-6). The two most common risk factors for dose preparation were therapeutic risk, 75% (94/126), and use of part/greater than 1 vial, 62% (78/126). The majority of doses were prepared, 75% (95/126), and administered, 93% (117/126), by the consultant anaesthetist, followed by Operating Department Practitioners (ODP), trainee anaesthetists and anaesthetic nurses. Table 2 illustrates non-compliance in practice with the NPSA SOP particularly failure to prescribe, 79% (100/126), no independent second check, 79% (100/126) and no labelled concentration 74% (93/126).

Discussion
From the risk scores attributed to each injectable medicine prepared in Theatres it can be seen that the majority are categorised as low risk products, NPSA category green. However one drug was categorised as red and so risk reduction measures are required. These measures could include using an infusion monitoring form, providing additional training, using ‘smart’ infusion pumps, or, if it were to become available, using a ready made preparation. Only one ‘red’ drug was identified which may seem at odds with the type of medication used in Theatres. This is because the assessment tool has been designed to assess the potential risks in preparation and administration rather than the clinical risk of the drug itself. Opiates, anticoagulants, local anaesthetics and anaesthetics drugs are known to have caused severe patient harm. Despite low scores on this assessment, risks associated with these drugs used in this setting need to be managed.

Table 2 shows there is considerable non-compliance with the NPSA SOP for the preparation of injectable medicines. This deviation from the NPSA SOP suggests that although the majority of medicines used are of low risk, these medicines are being used in a potentially risky manner. The majority of doses are prepared and given by the consultant anaesthetist and so this would be the most obvious group to target to raise awareness of the safe use and preparation of injectable medicines.

Risky business in theatres?

Hanks F, King H, Cavell G
Pharmacy Department, Kings College Hospital Foundation Trust, London

Introduction
The potential for serious drug errors in Theatres and Anaesthetics has been recognised as being greater than other clinical areas. This is because the drugs used in anaesthetics are of high therapeutic risk, may be used in combination, with several drugs being given within a short period of time often under stressful conditions. Additionally doses may be prepared in advance as they could be needed urgently. Lack of adequate labelling or the number of different drugs and syringes in use at any one time may increase the risk of the wrong drug being selected.

From the risk scores attributed to each injectable medicine prepared in Theatres using National Patient Safety Agency (NPSA) risk assessment tool. Secondly, to assess whether the practice of Theatre staff is associated with increased risk by auditing compliance with the NPSA Standard Operating Procedure (SOP) for preparing injectable medicines.

Objectives
- To carry out risk assessments of IV medications prepared in Theatres and to assign a risk score to that medication.
- To assess if current practice is compliant with the preparation and administration standards set out by the NPSA SOP.

Method
Firstly, a Data Collection Form (DCF) was drafted and piloted. The DCF was based on the NPSA risk assessment tool for individual injectable products and also included 7 risk factors from the NPSA SOP for preparation of IV medication. These risk factors formed the audit criteria. The DCF was analysed to generate a risk score for each medication prepared. Data was collected over a 5 day period in January 2008, by visiting Main Theatres, Day Surgery, Cardiac Theatres and Neurosurgical Theatres.
The limitations of this audit include the risk assessment tool itself as the scoring is open to some interpretation resulting in potential variations between different assessors. Also if the audit were to be repeated a greater number of operators should be observed to give a more complete picture of Theatre practice.

**Recommendations:** These include, reviewing the Trust Medicines Policy to include the scope of practice of theatre staff and the NPSA SOP for the preparation and administration of IV medication. To arrange sessions for Theatre staff to provide education and training on the Trust Medicines Policy, and Patient Safety Alert 20, and to implement risk reduction measures for insulin infusions as this was classified as an NPSA ‘red’ drug.

**References**

---

**20**

**Current management of warfarinised in-patients**

**Ali AN, Broadbent CA, Oborne CA.**
Department of Pharmacy, Guy’s and St. Thomas’ NHS Foundation Trust, London

**Introduction**
Warfarin is one of the top ten drugs frequently associated with prescribing and administration errors in secondary care. The NHS Litigation Authority reports that medication errors involving anticoagulant therapy are in the top ten causes of claims against NHS Trusts. The National Patient Safety Agency (NPSA) identified 14 high risks associated with anticoagulation therapy. Between 1990-2002 there have been 480 reported cases of harm or near harm from anticoagulants in the UK (77% from warfarin) with 120 reported deaths.

**Objectives**
1. To assess prevalence of patients prescribed warfarin as inpatients
2. To assess current management of warfarinised inpatients against relevant identified risks

**Method**
A point prevalence approach captured warfarinised inpatients on a single day across two hospitals (54 wards/units). Wards managed by the mental health trust were excluded. Inclusion criteria were patients prescribed warfarin (including warfarin withheld due to a high INR). Patients established on warfarin previously but temporarily stopped for a procedure (e.g. impending surgery) or due to commence warfarin later, were excluded. A data collection proforma with explicit guidance notes were available. Data regarding completed clinical information was ascertained by looking at discharge letters and yellow books. The patient did not have a yellow book in hospital, they were considered not to have a yellow book regardless of having a book at home. The patient was asked if they had been given information on how to manage their warfarin on discharge.

**Results**
From 997 inpatients screened, 34 (3.4%) were prescribed warfarin, of which 26 (77%) were established on warfarin prior to admission. A total of 25 (74% of all warfarinised inpatients) received a loading or re-loading dose: 8/34 (23.5%) had not discontinued therapy on admission. One patient was not reloaded, as this was not indicated for atrial fibrillation. Loading doses: Eight different regimens were used for warfarin initiation. 1/8 (12.5%) patients were re-loaded using the outpatient protocol. One (12.5%) patient was loaded using the Fennerty system and 6/8 (75%) received other regimens with different daily doses. Re-loading doses: 17/25 (68%) patients were re-loaded, however 11/17 (65%) re-loading inpatients received regimens other than outpatient protocol or Fennerty of which there were nine different re-loading regimens used. Missed doses: From the 25 patients, 1/80 (1%) prescribed loading dose was unintentionally omitted by nurses. INR results: The proportion of patients in range increased with increasing duration of recommencement of therapy. Just over half patients were in range at discharge (Table 1).

Advice at discharge: Of 997 inpatients, 201 (20.2%) patients were discharged in the audit timeframe, and 7 (3.5%) patients were discharged on warfarin. Most, (6/7, 86%) patients were either given or had their own yellow anticoagulation record book. All 7 (100%) patients received warfarin counselling from a multidisciplinary team member that was enough information for safe warfarin treatment. All 7 patients had anticoagulation clinic appointments booked before discharge. Information about dose and target INR was poorly documented on discharge letters (Table 2).

**Discussion**
We assessed 2/14 risks identified by NPSA: prescribing wrong doses (especially loading doses) and unsafe hospital discharge arrangements including lack of communication to GP.

We found a small proportion of patients on warfarin, however, this would be higher overall as we only included patients prescribed warfarin on the day of data collection. Therefore, this does not account for all high-risk patients (who usually take warfarin).

The NPSA Work Competences stipulates that the patient-held anticoagulation records are updated and the next healthcare providers (e.g. GPs) are notified of the INR on discharge, target INR and indication. Completeness of patient-held records discharge letters was not assessed as it was expected that, ideally, the INR should in range on day 4 and definitely in range on day 7 after (re-)loading. If there were no day 4 or 7 results, day 3 or 6 results (respectively) were recorded if available. Data regarding completed clinical information was ascertained by looking at discharge letters and yellow books. If the patient did not have a yellow book in hospital, they were considered not to have a yellow book regardless of having a book at home. The patient was asked if they had been given information on how to manage their warfarin on discharge.

**Table 1: INR results for (re-)loading warfarin inpatients over time**

<table>
<thead>
<tr>
<th>INR result</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below</td>
<td>In range</td>
</tr>
<tr>
<td>Day 4 (n=25)</td>
<td>13 (52%)</td>
</tr>
<tr>
<td>Day 7 (n=25)</td>
<td>2 (8%)</td>
</tr>
</tbody>
</table>

| Day of discharge (n=7) | 1 (14.3%) | 4 (57.1%) | 1 (14.3%) | 1 (14.3%) |

**Table 2: Completed clinical information on discharge (n=7)**

<table>
<thead>
<tr>
<th>Number of patients with completed clinical information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Yellow book</td>
</tr>
<tr>
<td>Discharge letter</td>
</tr>
</tbody>
</table>
An audit on the appropriate prescribing of thromboprophylaxis for surgical patients

Dale CE, Anwar I
Pharmacy Department, University Hospital of North Staffordshire NHS Trust, Stoke on Trent

Introduction
Hospitalised patients, and particularly those who have undergone a surgical procedure, are at risk of developing venous thromboembolism (VTE), the collective term for deep vein thrombosis (DVT) and pulmonary embolism (PE). The most efficient way to prevent these potentially disabling and fatal conditions in surgical patients is to use prophylaxis, consisting of mechanical methods of improving blood flow (for example, Thrombembolism Detergent [TED] stockings), pharmacological therapy and other general measures, such as hydration and early mobilisation. The National Institute for Health and Clinical Excellence recommends that all surgical inpatients should be assessed for VTE risk and appropriate thromboprophylaxis administered. Risk factors that must be taken into account depend not only on the illness, trauma or planned surgical procedure, but also on pre-existing patient-related variables.

According to the University Hospital of North Staffordshire (UHNS) thromboprophylaxis guidelines, surgical patients falling into the low-risk category should be prescribed TEDS, moderate-risk patients should receive TEDS plus dalteparin 2500units daily and high-risk patients, TEDS plus dalteparin 5000units daily (or unfractionated heparin 5000units twice daily).3

Objective
To calculate surgical in-patients' risk factor scores for VTE, and to determine whether the prescribed thromboprophylaxis matches the recommended prophylaxis, as outlined in the UHNS Surgical Guidelines 2007/08.2 The audit standard is that 100% of individuals should receive appropriate thromboprophylaxis, in accordance with the guidelines, exceptions being where recommended thromboprophylaxis is contra-indicated.

Method
A data collection form was designed listing all the risk factors for VTE and their associated risk factor values, as specified in the UHNS surgical guidelines. After a pilot of the form, data was collected as part of the pharmacists’ review of thirty consecutive new admissions to general surgery and vascular surgery wards, during May and June 2008. The patients included in the study were surgical in-patients, not currently diagnosed with DVT or PE, and whose notes were available for review. For each patient, risk factors for VTE were determined from the notes and their individual risk factor values were added up to give an overall risk factor score, placing the patient into either a low, moderate or high-risk category for VTE. The in-patient chart was reviewed for the prescription of thromboprophylaxis, and a record was made of whether the prescribed thromboprophylaxis matched the recommended thromboprophylaxis. If there was a discrepancy between the prescribed and recommended thromboprophylaxis, the reason for that discrepancy was determined and classified as being intentional or unintentional. If this was not recorded in the notes, a doctor was approached and asked to explain the discrepancy. The grade of prescriber was also recorded.

Results
Of the thirty patients included in the audit, 22 patients (73%) were prescribed the recommended thromboprophylaxis and 8 patients (27%) were not prescribed the recommended thromboprophylaxis.

Of the eight patients not prescribed recommended thromboprophylaxis according to the UHNS surgical guidelines, there had been an intentional decision to deviate from the guidelines in 4 patients. In three cases, the patients were elderly (>70 years), and this combined with other risk factors placed them into the high-risk category with a recommended prophylactic regime of TEDS and dalteparin 5000units daily. In these three elderly patients, who were also overweight and frail, the prescriber made the decision to give TEDS and dalteparin 2500units daily instead, due to perceived bleeding risk. In the fourth case, the patient fell into the low-risk category but had had major surgery 7 weeks previously so the prescriber made the decision to prescribe thromboprophylaxis of TEDS and dalteparin 2500units daily.

For the other four patients not prescribed recommended thromboprophylaxis, deviation from the guidelines had been unintentional. These four patients represent 13% of the total study population. All of these patients were prescribed a lower level of prophylaxis than appropriate for the level of risk. One patient was prescribed no thromboprophylactic agents.

Junior doctors had prescribed 70% of prescriptions written for thromboprophylactic agents, including the three cases where prescribed thromboprophylaxis was unintentionally at a level lower than recommended for the patients’ risk group.

Discussion
At the UHNS, it would appear from this small audit that at least 13% of surgical in-patients are unintentionally being underprescribed thromboprophylactic agents in the peri-operative period. A subgroup of patients were also identified, who had intentionally been prescribed a lower level of prophylaxis than recommended for the level of risk. Doctors and surgeons perceiving that the risk of VTE is not high enough to justify the potential haemorrhagic complications of anticoagulant use may explain this. However, a decision based on this perception is not necessarily appropriate.

Our rates were comparable to those in another UK hospital. An audit published in 2006, showed that 16.1% of VTE prophylaxis on surgical wards violated recommended guidelines, even 2 months after the circulation of departmental protocols for VTE prophylaxis.1

An article published in 2007 recognised that despite the considerable evidence for thromboprophylaxis, it is poorly implemented in the UK. Contributing factors were identified as poor education and health professionals’ lack of awareness of VTE.4 Pharmacists can play an important role in helping to reduce the cases of inadvertent omission or the use of a lower level of thromboprophylaxis than appropriate for the level of risk by raising awareness of the thromboprophylaxis guidelines.
Adherence to an inpatient anticoagulant guideline achieves better INR control

Hatton K1,2, Wonnacott K1 and Oborne CA3
The Lewisham Hospital NHS Trust1; Guy’s and St Thomas’ NHS Foundation Trust2

Introduction
Incidents involving anticoagulant therapy are among the most frequently reported medication errors in secondary care. In the UK between 1990 and 2002, 600 patient safety incidents were reported involving anticoagulants which resulted in harm or near harm to a patient, of which 20% (120) resulted in the death of the patient. In order to standardise prescribing and minimise risk, the trust guidelines for initiation of warfarin therapy are based on the Fennerty schedule1 for the management of venous thromboembolism (VTE), with a more conservative approach suggested (3 - 5mg daily, with first INR check at day 5) for atrial fibrillation (AF), based on national guidelines2. In March 2007 the National Patient Safety Agency (NPSA) issued a safety alert for anticoagulants, specifying nine actions which needed to be implemented in both primary and secondary care. One of the areas highlighted was the initiation of oral anticoagulation therapy, of which eight safety indicators were detailed. Four safety indicators, where data could be collected retrospectively, have been assessed as part of this audit.

Objectives
1. To audit the following NPSA safety indicators:
   - the percentage of patients initiated according to the trust loading guidelines
   - the percentage of patients developing an INR over 5.0 during initiation
   - the percentage of patients in therapeutic range at discharge
   - the percentage of patients with a sub-therapeutic INR when heparin is stopped
2. To assess if anticoagulation guideline adherence leads to a therapeutic INR by day 5
3. To determine whether guideline adherence leads to a therapeutic INR at first outpatient check

Method
A data collection form was piloted on 5 patients, modified, then used to record data. Patients newly referred to the anticoagulation clinic between 1st August 2007 and 30th November 2007 were identified from electronic clinic records. Retrospectively, their electronic discharge summaries were reviewed to determine if warfarin had been initiated during that inpatient stay. Demographic, prescribing and administration data were obtained from inpatient notes, drug and anticoagulant charts in order to determine guideline adherence. Liver function tests and coagulation tests (baseline and outpatient) were retrieved from the trust pathology system.

Results
41 patients were identified of which 21(51%) were started on warfarin for VTE, with the remaining 20 for AF. The guideline was followed in less than one third of patients (Table 1).

Of the VTE treated patients, 10 (48%) received heparin/enoxaparin treatment for at least 48 hours once the INR was therapeutic and 15 (71%) received a minimum of five days of heparin/enoxaparin. For all indications, adherence to the guideline was more likely to produce a therapeutic INR at day 5 and also at the first outpatient check (Table 2).

Discussion
Our finding that adherence to the trust warfarin initiation guidelines leads to better anticoagulant management, with more patients achieving a therapeutic range earlier confirms the suitability of the current guideline. Non-adherence, including inappropriate dosing of warfarin and premature termination of warfarin (Table 1) placed patients at an increased risk of thrombosis or haemorrhage, and was a worrying finding. The guideline recommends continuation of heparin for a minimum of 5 days, and for at least 48 hours after achieving a therapeutic INR due to the initial pro-thrombotic risk associated with warfarin and it’s unpredictability during initiation. These results will be fed back to prescribers and pharmacists to address this issue.

A number of patients were discharged with sub-therapeutic INRs, particularly in the AF group. This NPSA indicator is more controversial, as prolonged inpatient stay increases costs. If timely outpatient follow-up is arranged then low risk AF patients can be safely managed out of hospital during warfarin initiation.6,6

It is the responsibility of the hospital trust to ensure that staff involved in the prescribing, monitoring and administration of anticoagulant therapy have the necessary competence to undertake their duties safely.1 The NPSA has commissioned e-learning modules to support training which are currently voluntary. However mandatory training needs to be introduced to confirm competency of all staff involved, including prescribers, pharmacists and staff nurses. This audit was limited by small patient numbers, and difficulty in determining other factors affecting INR (e.g. interacting drugs). Future work should aim to re-audit these indicators in 6 months time, along with assessing the four remaining NPSA indicators for anticoagulant initiation.

Table 1: NPSA safety indicators for patients starting oral anticoagulant treatment

<table>
<thead>
<tr>
<th>Indication for warfarin</th>
<th>Warfarin initiated according to guideline (%)</th>
<th>Developed INR&gt;5 up to first outpatient appointment (%)</th>
<th>Therapeutic INR (INR 2.0-3.0) at discharge (%)</th>
<th>Subtherapeutic INR (INR&lt;2.0) when heparin stopped (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTE (n=21)</td>
<td>5 (24)</td>
<td>3 (14)</td>
<td>11 (52)</td>
<td>5 (24)</td>
</tr>
<tr>
<td>AF (n=20)</td>
<td>7 (35)</td>
<td>1 (5)</td>
<td>4 (20)</td>
<td>12 (60)</td>
</tr>
<tr>
<td>Total (n=41)</td>
<td>12 (29)</td>
<td>4 (10)</td>
<td>15 (37)</td>
<td>17 (41)</td>
</tr>
</tbody>
</table>

Documentation of patient details, indication, target INR and planned duration on the chart were complete for 33 (82%) patients. All (41, 100%) patients received every dose prescribed.

Table 2: Patients with INR in therapeutic range at day 5 and first outpatient check

<table>
<thead>
<tr>
<th>Indication</th>
<th>Therapeutic INR (2-3) by day 5</th>
<th>Non-adherence (n=20)</th>
<th>Adherence (n=12)</th>
<th>Fishers exact test</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTE</td>
<td>10 (83%)</td>
<td>5 (17%)</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>AF</td>
<td>8 (67%)</td>
<td>3 (10%)</td>
<td></td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

References
23 Pre-surgery: Are medicines stopped or not?

Tuthill A, Foster K and Oborne CA
Pharmacy Department, Guy’s and St. Thomas’ NHS Foundation Trust, London.

Introduction
The local Nil By Mouth (NBM) Medicines Policy1 provides advice on the management of medicines in the peri-operative period for planned and emergency surgery. The policy aims to minimise cancelled procedures and peri-operative complications by stopping, where possible, medicines that may increase surgical risk whilst continuing other medicines to maintain existing conditions. This work audited the peri-operative management of medicines prior to the launch of a new guideline in 2008.

Objectives
1. For elective surgery: To determine the appropriateness of advice given to patients pre-operatively, the format of the advice, patient compliance with advice, documentation in the clinical notes and whether the advice complies with the NBM policy1.
2. For emergency surgery: To determine compliance with the NBM policy before surgery.

Method
Data were collected on eleven adult surgical wards over one day. Patients more than six week post surgery and patients on no medicines were excluded. Data collected from patients’ clinical notes included: attendance at pre-admissions clinic and documentation of advice provided (for elective admissions); drug history, continuation or stopping and stop date of each medicine. Data collected by patient interview (for elective admissions) included medicines advice provided prior to admission, advice format (verbal or written) and whether advice was followed. The NBM policy and drug histories were used to assess advice to continue NSAIDs and not stopping aspirin early enough.

Results
Of 80 patients included, 51/80 (64%) were elective and 29/80 (36%) emergency admissions.

For elective surgery patients, 36/51 (71%) were seen in pre-admissions clinic and 21/36 (58%) had documented evidence of medicines information provision (Figure 1). Patients should have been advised to stop 24/172 medicines prior to admission1, correct information was provided 9/24 (38%) times (Table 1). Incorrect information was provided for 7/24 (29%) medicines, this included advice to continue NSAIDs and not stopping aspirin early enough. Documentation of exact advice in the clinical notes occurred 4/21 times (19%) (Figure 1). Written instructions were provided ten times, patients reported 90% compliance with advice. Of 206 medicines prescribed for emergency admissions, 74/206 (36%) prescriptions complied with the NBM policy1, 39/206 (19%) did not and 5/206 (2%) were not clear.

Many medicines (88/206, 41%) were not covered by the policy. Overall compliance with NBM policy1 for advice prior to elective admissions and prescribing on the ward varied between drug class. Policy compliance for beta-blockers was 10/11 (91%), antidepressants 12/15 (80%), anti-platelets 17/26 (65%), oral hypoglycaemics 3/12 (25%) and NSAIDs 1/7 (14%).

Discussion
Adherence with the current policy1 is poor for both elective and emergency surgical patients. Worryingly incorrect or no information, about medicines that need to be stopped prior to surgery, was provided 62% of the time in pre-admissions clinic. This could increase peri-operative complications for example, bleeding for aspirin and NSAIDs and lactic acidosis for metformin. Advice from other sources was not assessed, ideally all patients should attend pre-admissions clinic in order to ensure correct advice is provided, specific to their operation. Advice in the policy differs for emergency surgery due to time limitations, but still aims to minimise risk where possible.

Of patients seen in a pre-admissions clinic, 42% had no recollection of receiving information about medicines and no advice was documented in their clinical notes. The reason that no information was provided was not assessed in this audit. Patients’ recollection of verbal advice could not be assessed, as documentation of the exact information provided in clinical notes was poor. Patients’ compliance with written instructions was good thus patients should be provided with written information about all medicines that should be stopped prior to surgery. The instruction sheet should clearly state to continue all other medicines. A copy of this should be filed in the medical notes to improve documentation of advice provided. A significant number of medicines are not included in the current policy. A new policy needs to include more medicines, clearly state how to manage medicines that are not included in the policy and provide information on restarting medicines. The new policy also needs to direct staff to use the pharmacy referral service when necessary.

References
4 Anticoagulant prescription chart 2007. The Lewisham Hospital NHS Trust.

Table 1: Information provided by pre-admissions clinic about medicines that needed to be stopped prior to admission

<table>
<thead>
<tr>
<th>Number of medicines</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct information provided</td>
<td>9</td>
</tr>
<tr>
<td>Incorrect information provided</td>
<td>7</td>
</tr>
<tr>
<td>No information provided</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
</tr>
</tbody>
</table>

Figure 1: Documentation of advice about regular medication prior to admission
Comprehensive training for pre-admission clinic staff, doctors, nurses and pharmacists is required with the launch of the new guideline. A separate audit is required to assess peri-operative management of diabetes and anticoagulants in more detail. Re-audit following the launch of the new guideline would hopefully show an improvement in the management of medicines peri-operatively and identify further areas for improvement and risk reduction for pre-existing medical conditions.

Reference
1 Study NHS Foundation Trust, ‘Nil By Mouth’ Medicines Policy, 2002 (last updated 2005).

24 Can pharmacy intervention improve medication practice for elective surgery patients at University Hospital Lewisham?

Hoad M, MRPharmS, Surgery Pharmacist; Iossifidis F, MD FRCA Consultant Anaesthetist
Lewisham Hospital NHS Trust, London

Introduction
Patients undergoing elective surgical procedures who take medication for chronic conditions have a higher incidence of peri-operative complications and unintentional abstinence from medication is associated with adverse outcomes. Review by the Healthcare Commission showed improvement can be made to the recording and review of patients’ regular medications on admission and pharmacist intervention in pre-assessment clinic has been shown to reduce medication discrepancies.

Objectives
Preliminary study to establish the existing medication-related practice undertaken for elective surgery patients in the surgical pre-assessment clinic at University Hospital Lewisham and determine if pharmacy intervention can improve such practice through assessment of the accuracy of: drug history taking, pre-operative medication advice and prescribing of inpatient medication charts.

Method
Patients included in the audit were those admitted for an inpatient stay for orthopaedic or vascular surgery from December 2007 – February 2008 who underwent surgical pre-assessment prior to admission. Patients were allocated to the control or intervention group, dependent on their date of attendance at the nurse-led surgical pre-assessment clinic. Collection of drug history information and provision of pre-operative medication advice were required for all patients as part of the standard pre-assessment screening proforma.

Patients pre-assessed prior to the period of pharmacist intervention formed the control group (30 patients: 24 orthopaedic, 6 vascular) whilst the intervention group (30 patients: 28 orthopaedic, 2 vascular) received pharmacy intervention in addition to standard pre-assessment screening. Pharmacy intervention consisted of a pharmacist consultation with the patient to (i) confirm the drug history, (ii) provide pre-operative medication advice from draft guidance and (iii) transcribe regular medications onto the inpatient medication chart. As pre-assessment sessions for all patients were restricted to the same working hours (i.e. 9am - 5pm weekdays) and all received the same pre-appointment instruction letter, conditions for sourcing all information, e.g. drug history data, were the same for both the control and intervention groups.

On admission to the ward, data were collected to identify accuracy of: drug history taking in pre-assessment clinic, pre-operative medication advice and reconciliation of regular medication when prescribing the inpatient medication chart. No previous audit had been undertaken to establish appropriate standards for these criteria therefore an outcome of this work will be to set standards against which re-audit can be performed.

Results
Five complete drug histories were recorded for the control group compared with 29 complete drug histories in the intervention group. A complete drug history documents allergy status (drug name and reaction) and lists all regular and occasional medications used, whether prescribed or purchased.

Table 1 gives details of the pre-operative medication advice given to patients. A similar number of patients and drugs required pre-operative medication advice, as stated in the draft guidance, in both the control and intervention groups. However, advice was not given for 27 drugs in the control group compared with 1 drug in the intervention group.

On admission, 7 inpatient medication charts were complete in the control group compared with 27 complete charts in the intervention group. An inpatient medication chart was considered to be complete when all regular medications from the drug history were accurately prescribed (with some exclusions e.g. analgesia, warfarin).

In the control group, 37 regular medications were omitted from charts, including anti-hypertensives, aspirin, inhalers and insulin, resulting in 62 missed drug doses. In particular, 6 patients had no regular medications prescribed at the point of admission to a ward. No medication omissions were identified in the intervention group.

Discussion
Pharmacist intervention resulted in the documentation of more complete drug history records in the surgical pre-assessment clinic and ensured patients received more complete pre-operative medication advice by reference to draft guidance. Transcription of regular medications by the pharmacist onto the inpatient medication chart at the point of pre-assessment ensured more charts were complete on admission and unintentional abstinence from medication was avoided.

Pharmacy intervention was shown to improve medication-related practice therefore use of the tools employed by the pharmacist during the intervention period should be implemented for all elective surgery patients seen in surgical pre-assessment clinic. Clinical staff consulting with patients in pre-assessment clinic should be educated on taking a drug history and have access to guidance from which pre-operative medication advice can be given. Patients should be provided with documentation stating their pre-operative medication instructions and a record of the advice given should be made in their medical notes. In addition, a patient’s regular medications should be transcribed onto the inpatient medication chart within the pre-assessment clinic in preparation for their admission.

References
25

Audit

An audit of the INR target aims for patients with mechanical prosthetic heart valves

Perrott R and Topping K
Department of Pharmacy, King’s College Hospital NHS Foundation Trust, London

Introduction

Oral anticoagulation with vitamin K antagonists (VKAs) is indicated for patients with mechanical prosthetic heart valves. The frequency of thromboembolism is lower with modern valves than first generation valves). Therefore the recommended INR targets for heart valve patients were recently refined and in 2005 the British Society for Haematology (BSH) specified recommendations for valve location and type specific target INRs as indicated below.

<table>
<thead>
<tr>
<th>Valve type</th>
<th>Position</th>
<th>Target INR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bileaflet</td>
<td>Aortic</td>
<td>2.5</td>
</tr>
<tr>
<td>Tilting Disk</td>
<td>Aortic</td>
<td>3.0</td>
</tr>
<tr>
<td>Bileaflet</td>
<td>Mitral</td>
<td>3.0</td>
</tr>
<tr>
<td>Tilting disk</td>
<td>Mitral</td>
<td>3.0</td>
</tr>
<tr>
<td>Caged ball or caged disk</td>
<td>Aortic or Mitral</td>
<td>3.5</td>
</tr>
<tr>
<td>Unknown*</td>
<td>Aortic</td>
<td>3.0</td>
</tr>
<tr>
<td>Unknown*</td>
<td>Mitral</td>
<td>3.5</td>
</tr>
</tbody>
</table>

*For those patients with an unknown valve type INR targets are still defined

All patients with mechanical prosthetic heart valves should be anticoagulated to the above targets unless there is a specific indication for an alternative target. At present, patients with mechanical heart valves have a target INR range documented on a hospital database (DAWN) which is used to dose the VKA accordingly. The current hospital inpatient anti-coagulation chart specifies an INR target range of 2.0–4.0 for all mechanical valve patients, unless the cardiothoracic surgeon specifically states otherwise.

Objectives

The objectives were to:

- Identify all anticoagulated mechanical prosthetic valve patients and determine valve position and type where possible.
- Identify their current hospital database INR target range.
- Determine whether patients are being anticoagulated inline with the BSH guidance.
- If appropriate propose actions to improve compliance with BSH guidance.

Method

All mechanical valve patients and current INR targets were identified from the DAWN anticoagulation database. Information from the DAWN database, referral letter and the electronic patient records system was used to identify the patient’s valve position and where possible the type of valve. The current target INR was then compared with the BSH recommended target INR. The rate of adherence was then assessed against an audit standard of 100% adherence to the BSH recommended targets (as above).

Results

One hundred and forty two patients with valve replacements were identified. Six patients were excluded as INR target ranges could not be determined and/or the range had been amended due to adverse effects of the VKA. Forty eight patients had mitral valve replacements, 82 had aortic valve replacements and 6 patients had both. There were 60 patients with a known valve position and type and 76 in whom only the position of the valve was known. The results are summarised in table one and two above.

Twenty one percent (28) of patients are currently anticoagulated to the updated BSH INR targets. Thirty nine percent of valve patients are anticoagulated to the broad range of 2.5–4.0.

Discussion

The majority of patients do not have INR targets in accordance with the new BSH guidelines. Current practice may cause unnecessary over anticoagulation which should be avoided since intensity of anticoagulation is a major determinant of bleeding risk. Although all patients will have a target within the range of 2.5–4.0 the use of this broad non-specific range should be avoided as it risks both over and under coagulation.

Limitations of the audit included the inability to determine the type of valve for over half the patients. In addition, indication for alternative INR target ranges may not have been specified in the information sources used.

Proposed changes following this audit include amendment of the current anticoagulation chart to ensure the valve type and position can be endorsed by the cardiothoracic team. This will ensure that all newly anticoagulated patients have the correct INR targets. All staff involved in anticoagulating patients with valves will need to be educated regarding the new guidance. The decision to change current patients to the newly recommended targets is complex and will involve discussion with the cardiology and haematology consultant teams.

Although there is at present a low level of adherence to the BSH recommended targets, this can be partly explained by the fact that the BSH guidance is new and historic INR targets have been employed. This will be addressed by the above interventions and a future re-audit will be used to confirm an improvement in adherence to the audit standard.

References


Table 1: INR targets for valve patients

<table>
<thead>
<tr>
<th>Recommended INR target (BSH)</th>
<th>No of patients with BSH recommended target on database</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>5/27 (19%)</td>
</tr>
<tr>
<td>3.0</td>
<td>14/77 (18%)</td>
</tr>
<tr>
<td>3.5</td>
<td>9/32 (28%)</td>
</tr>
<tr>
<td>Total</td>
<td>28/136 (21%)</td>
</tr>
</tbody>
</table>

Table 2: INR targets for patients according to type and position of valve

<table>
<thead>
<tr>
<th>Valve position</th>
<th>Valve type</th>
<th>No. of patients with BSH recommended target on database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic</td>
<td>Unknown</td>
<td>5/45 (11%)</td>
</tr>
<tr>
<td>Mitral</td>
<td>Unknown</td>
<td>7/27 (26%)</td>
</tr>
<tr>
<td>Aortic and Mitral</td>
<td>Unknown</td>
<td>2/4 (50%)</td>
</tr>
<tr>
<td>Aortic</td>
<td>Known</td>
<td>8/37 (22%)</td>
</tr>
<tr>
<td>Mitral</td>
<td>Known</td>
<td>6/21 (29%)</td>
</tr>
<tr>
<td>Aortic and Mitral</td>
<td>Known</td>
<td>0/2 (0%)</td>
</tr>
</tbody>
</table>
Table 1: Changes in lipid management over the last 10 years

<table>
<thead>
<tr>
<th></th>
<th>1998 (n=56)</th>
<th>2001/02 (n=86)</th>
<th>2006-08 (n=166)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% with up to date levels before PAC</td>
<td>28% (16)</td>
<td>16% (14)</td>
<td>47% (134)</td>
</tr>
<tr>
<td>% with levels done on PAC request</td>
<td>54% (31)</td>
<td>64% (55)</td>
<td>34% (56)</td>
</tr>
<tr>
<td>% with no levels available by the time of surgery</td>
<td>16% (9)</td>
<td>10% (9)</td>
<td>4% (3)</td>
</tr>
<tr>
<td>% cholesterol levels below target*</td>
<td>24% (14)</td>
<td>48% (41)</td>
<td>76% (126)</td>
</tr>
<tr>
<td>% with no lipid lowering therapy on admission</td>
<td>49% (28)</td>
<td>28% (24)</td>
<td>8% (13)</td>
</tr>
</tbody>
</table>

*targets assumed to be 5 and 3mmol/L.

26

An audit of lipid management in patients undergoing elective coronary revascularisation surgery

K J K & Williams H
Kings College Hospital NHS Foundation Trust, London

Introduction

For patients with a history of cardiovascular (CV) disease there is substantial trial evidence that lipid management reduces CV mortality, total mortality and morbidity. Patients with a history of CV disease, including those undergoing coronary revascularisation surgery (CRS), should have serum lipid levels monitored and be prescribed lipid lowering therapy. For the last ten years patients referred to this Trust for CRS have been invited to attend the surgical pre-assessment clinic (PAC), which includes a review of lipid management undertaken by the pharmacist. This pharmacist input was initiated in 1997 following an initial audit in this patient group, which identified sub-optimal management; repeat audits were undertaken in 1998, 2001/02 and 2006-08. During all these audits the NHS cholesterol treatment targets1 were to aim to total cholesterol to less than 5mmol/L and low-density lipoprotein (LDL) cholesterol to less than 1mmol/L.

Objectives

The objectives of these audits undertaken over the past 10 years were:

- To assess how current lipid management compares to 10 years ago.
- To quantify and compare lipid management interventions made in each audit.

Method

Audits were undertaken in 1998, 2001/02 and 2006-08. Data were collected from pre-admission up to the point of discharge, on standard data collection forms and kept in the patient's notes. Once the patient was admitted the relevant information was extracted and retained for processing using Microsoft Excel in pharmacy. Listed below are the audit standards that were common to all three audits.

- 100% of patients should have their current lipid status clearly documented.
- 100% of patients with out of date levels at pre-assessment should be referred to their GP for re-testing or should be tested on admission prior to surgery.
- 100% of patients should receive a post-operative lipid review which leads to a documented decision on future lipid management.
- 100% of patients not on lipid lowering therapy should be initiated on drug treatment, unless contraindicated.
- 1005 of patients with raised cholesterol, already prescribed lipid lowering therapies will be assessed individually as to the appropriateness of that therapy and where necessary, an intervention made.

Results

Data has been collected from 309 patients over the last 10 years across the three audits. The results of these three audits are summarised in table 1. With improved lipid management throughout the course of these audits there has been a small decrease in the number of interventions made, with 67% of patients receiving interventions in 1998, 56% in 2001/02 and 44% in 2006-08. Key lipid management interventions made over the past 10 years were adding a new therapy, changing the dose or agent prescribed, adding in additional therapy, providing advice on lifestyle and compliance or requesting that the GP retests cholesterol levels. Ten years ago the most common type of intervention was the initiation of lipid lowering therapy, this accounted for 35% of interventions in 1998 and only 8% in 2006-08. However the most recent audit has shown an increase in the number of patients who had their lipid lowering therapy titrated to a more aggressive regime by increasing the dose or adding a new agent; 13% of interventions in 1998 compared to 54% in 2006-08.

Discussion

These audits demonstrate that there has been an improvement in lipid management in patients presenting for elective coronary revascularisation surgery over the last 10 years. There has been an increase in the proportion of patients with appropriate lipid level monitoring prior to admission for surgery. In the latest audit, 47% of patients had up-to-date lipid levels, compared to 28% in 1998 and 16% in 2001/02. The proportion of patients prescribed lipid-lowering therapies prior to admission for surgery has increased. In 2006-2008, only 8% of patients were prescribed no lipid lowering therapy prior to admission compared to 49% in 1998. There has been an improvement in the proportion of patients with lipid levels achieving the NHS audit standards (total cholesterol < 5mmol/L and LDL cholesterol < 3mmol/L), from only 24% in 1998, to 48% in 2001/2 and 76% in 2006/08.

Despite this improvement over time, the audits have demonstrated there is still a need for interventions to optimise lipid management during elective surgical admissions. In recent years, fewer patients have required the initiation of first line lipid lowering therapy as a larger proportion were already receiving therapies prior to admission. However, in the latest audit there was evidence of an increased need for dose titration of lipid lowering therapies or the initiation of additional or alternative agents as more aggressive lipid lowering is pursued. Changes in the types of interventions made probably reflect a gradual shift towards more aggressive lipid targets and the accumulation of evidence demonstrating the importance of well-controlled cholesterol levels in secondary prevention of CV disease.

Recently NICE has issued Lipid Modification clinical guidelines, which aim for more aggressive cholesterol levels of total cholesterol less than 4mmol/L and LDL cholesterol less than 2mmol/L for secondary prevention.1 Of the patients involved in the latest 2006-08 audit only 34% adhere to these lower levels. This presents a new challenge to clinicians seeking to optimise lipid management, as more intensive regimens will be required. It could be argued that in many ways, we are in the same position as we were 10 years ago in terms of reaching current NHS treatment targets and that this audit has demonstrated there is still room for improvement in lipid management for this high-risk group. Further audits will be necessary to assess how well the new treatment targets are being adhered to in this patient group.

The main limitation of this study was the time over which it was undertaken, which meant that different members of staff were processing the data at different times and in slightly different ways, this made unifying the results prior to comparison was quite time consuming.

References

Use of extended thromboprophylaxis in high risk surgical patients

R. Patel, K. Foster and N. Husain
Department of Pharmacy, Kings College, London, Pharmacy Department, Guy’s and St Thomas’ NHS Foundation Trust

Introduction
Venous thromboembolism (VTE), which encompasses deep vein thrombosis (DVT) and pulmonary embolism (PE), is the largest cause of preventable death in hospital.1 In May 2007, Guy’s and St Thomas’ NHS Foundation Trust (GSTFT) implemented a prescribing guideline for adult surgical inpatients. The guideline recommends extended thromboprophylaxis (28 day course of enoxaparin 40mg + graduated elastic compression stockings (GECs)) for very high risk patients undergoing total hip replacement (THR), hip fracture surgery (HFS), major gynaecological surgery for cancer or major general surgery for cancer.

Objective(s)
To determine the percentage of patients discharged on extended prophylaxis:
- whose discharge prescription is correct (drug, dose, duration)
- able to self-administer enoxaparin
- whose information needs are fully met prior to discharge
- who are fully compliant
- whose platelets are monitored five days post discharge
- who dispose of sharps safely

Method
All patients discharged on extended thromboprophylaxis over a two month period were identified by asking surgical ward Pharmacists to refer patients, examining records of dispensed discharge prescriptions and reviewing a report on all issues of enoxaparin from the pharmacy computer system. Data on type of surgery, date of surgery and extended prophylaxis prescribed (drug, dose, duration) were collected from the discharge prescription. Patients were then contacted and asked to complete a questionnaire via telephone interview. The questionnaire covered — whether self-administration of enoxaparin had been possible, quality of teaching provided by nursing staff during admission, provision of GECs, compliance, knowledge of adverse effects, platelet monitoring post discharge and disposal of sharps.

Results
Fifty six patients were identified and forty two were included in the audit (six refused to participate, eight could not be contacted). Twenty four patients had undergone major gynaecological surgery for cancer; eighteen patients had undergone major general surgery for cancer.

All patients were prescribed the correct dose of enoxaparin and the correct quantity to enable completion of a 28 day course. GECs were not prescribed; 24% patients were supplied GECs at discharge and a further 12% kept the GECs they had worn during their admission.

17% were administered enoxaparin by a family member or district nurse. All patients able to self-administer enoxaparin were taught how to do so prior to discharge. A variety of methods were used (Figure 1). All patients thought that the quality of teaching provided was either ‘excellent’ or ‘good’. 80% felt that no improvements needed to be made; 20% would have liked to have been taught earlier in their hospital stay.

55% injected into their thigh, 29% into their abdomen and 17% into their upper arm. All patients rotated the exact site of injection.

76% patients did not miss any doses of enoxaparin, 19% missed one dose, and 5% missed more than one dose. Reasons for missed doses included syringe breakage (three patients), forgetfulness (three patients), friend/relative not available to administer (three patients), intentionally stopped therapy (one patient, reason unknown). Of the 15 patients discharged with GECs, 13 wore them every day.

29% patients received information about potential side effects of enoxaparin. 38% experienced side effects (15 patients reported bruising at the injection site, one patient reported bleeding). Only 7% patients were instructed to visit their GP five days post discharge in order to have their platelet count checked.

83% patients were provided with a sharps bin and 64% were advised how to dispose of it. All patients given a sharps bin disposed of it safely (via local pharmacy, GP practice, hospital, district nurse), except one patient who disposed of it in their household waste.

Discussion
Patients prescribed enoxaparin on discharge for extended prophylaxis were prescribed it correctly. GECs and sharps bins should also be prescribed on the discharge letter in order to ensure that they are always supplied on discharge. At GSTFT this could be achieved by including a standard extended prophylaxis prescription in the electronic discharge letter program.

Most patients were able to self-administer enoxaparin and few reported missed doses, indicating that use post-discharge is achievable. Patients considered the quality of teaching provided by nursing staff to be good, however standardisation is required to ensure that all patients are informed about the correct site of administration (abdomen or thigh). Teaching should begin as soon as possible after surgery.

A patient information leaflet should be developed informing patients about potential side effects, action to take if these occur, need for GP to check platelet count five days post discharge and how to dispose of sharps bins.

References
1 Menon J, Hamilton G. Deep vein thrombosis. Surgery 2007; 25(8); 323-326

An audit of medication history taking on inpatient mental health wards

D. Baidoo, A. Attard
Guy’s and St Thomas’ NHS Foundation Trust, South London and Maudsley NHS Foundation Trust.

Introduction
Medication reconciliation is a 3-step process of (1) verifying medication use, (2) identifying discrepancies and (3) rectifying medication errors during transition at interfaces of care. The process consists of checking patients’ medication use prior to admission with medication that patients...
are prescribed on admission, followed by discussions with physicians, regarding therapeutic choice. A consequence of the shift of mental health services to community care is that mental health services are fragmented with numerous interfaces, between hospital and community services and between different components of the community mental health services. There may also be a lack of standardisation between different mental health services causing physicians who move between different mental health services to be unfamiliar with systems for prescribing, obtaining, and administering medication.

Medication reconciliation is a practice promoted by the National Patient Safety Agency (NPSA). NICE-NPSA guidance requires all patients admitted to hospital have medication reconciliation performed by a pharmacist, technician or suitably trained staff within 24 hours of admission. Action by pharmacists was required to be underway by 12th January 2008 and completed by 12th December 2008. An audit was conducted to assess current medication reconciliation practice in particular auditing medication history taking by pharmacy staff on inpatient mental health wards.

Objectives
1. To measure how many patients were admitted over a four week period to adult and older people inpatient mental health wards
2. To quantify how many patients had a medication history taken by pharmacy staff
3. To establish which member of the pharmacy team undertook medication histories
4. To determine the time taken to carry out each medication history
5. To verify how long after each patient admission a pharmacist completed medication reconciliation
6. To determine information sources used to obtain medication histories
7. To ascertain the frequency of discrepancies between medication prior to admission and what was prescribed on the inpatient drug chart

Method
Usual practice is for a doctor to confirm the patient’s medication history on admission. A pharmacist may also carry out a medication history and inform the doctor of any discrepancies. Occasionally a pharmacy technician may be involved in the verification of a patient’s medication history. Usual clinical practice was not interrupted for this audit.

Newly admitted patients on 3 mental health wards were identified and each drug chart was checked for a medication history documented by pharmacy staff for 4 weeks from 11th February to March 7th. The medication history was compared with medication prescribed by the doctor on admission. A discrepancy was defined as any difference between the medication history obtained and that which had been prescribed by the doctor at the time of the patient’s admission. The member of the pharmacy team undertaking each medication history, the timescale following each patient admission, the sources used and the time taken for pharmacy staff to complete each medication history was documented. The clinical significance of any discrepancies identified or interventions made were not assessed.

Results
Half of the patients admitted 10/19 (53%) had a medication history undertaken by pharmacy staff, and all pharmacy staff undertaking medication histories were pharmacists. The average time taken per medication history was 25mins (range 10-30mins). Of the medication histories undertaken 7/10 (70%) of these had discrepancies. The total number of discrepancies identified was 15 and the number of discrepancies per chart ranged from 0-4 discrepancies per chart.

For patients with a medication history taken by trained pharmacy staff 3/10 (30%) patients were seen within 24 hours, 3/10 (30%) patients were seen between 24-48 hours. A further 1/10 (10%) patients were seen between 48-72 hours and the remaining 3/10 (30%) patients were seen after a period of 72 hours. A significant percentage of the workload is out of hours with 4/19 (21%) patients admitted on Friday or over the weekend. The most common source of information used for a medication history was the general practitioner. Other sources included an interview with the patient, using patient’s own medication, the patient’s community mental health team, a community pharmacy or a combination of these sources.

Discussion
In comparison to the ideal standard set by NICE-NPSA that 100% of patients are seen within 24hours by pharmacy staff, only 10/19 (53%) patients had a medication history by trained pharmacy staff documented and 3/10 (30%) were seen within 24 hours. Overall 3/19 (16%) mental health inpatients had medication histories taken by a pharmacist which met NICE-NPSA requirements for medication reconciliation. The patient group studied were male and female adults and older persons mental health inpatients.

Reasons why best practice for medication reconciliation was not being achieved may include a lack of awareness about NICE-NPSA guidelines, and the absence of a Trust policy on implementing NICE-NPSA guidelines locally. Furthermore many mental health services have poorly developed systems to aid communication and support safe medicine management. Several inpatient mental health wards have a limited IT infrastructure, and rely on unintegrated paper based record systems, and the problem caused by poor prescribing systems is compounded by inadequate staffing and organisation of pharmacy services. Recommendations made to improve practice included (1) updating Trust Policy (2) increase staff (3) provision of an out of hours service for medication reconciliation and (4) re-audit.

References

29 An audit on the prescribing of enoxaparin for acute coronary syndromes (ACS) at Northampton General Hospital Trust (NGHT)

Tan J
Department of Pharmacy, Northampton General Hospital Trust

Introduction
The benefits of enoxaparin in ACS have been shown in the ESSENCE trial and further strengthened by TIMI 11B study. The current recommendations are: 1 mg/kg twelve-hourly, administered concurrently with oral aspirin for a minimum of 2 days. It was identified that patients were not being weighed prior to dosing enoxaparin and therapy continued after 48 hours even when patients were clinically stabilised. Underdosing in ACS could potentially increase the risk of 2nd infarction while overdosing and prolonged therapy increase the risks of haemorrhagic complications. Another issue that was highlighted about the recording of patients’ weights on chart, making it difficult to ascertain if patients had been weighed prior to dosing.

Objectives
a) To investigate if enoxaparin is being initiated appropriately following diagnosis of ACS.

b) To investigate if the dose of enoxaparin is prescribed according to patient’s weight.
Methods
A prospective audit was undertaken of medical patients prescribed enoxaparin for ACS over 10 weeks between September-November 2007. A data collection form was developed and piloted. The data collection form was designed to include the factors that would affect the dose of enoxaparin and the length of therapy that they received. A section for documenting pharmacists' interventions was also included to evaluate our service. All inpatients of NGHT that were prescribed enoxaparin for ACS were included in this audit. The data was collected from all wards covered by ward pharmacists at NGHT. Paediatric wards are excluded, as enoxaparin is not licensed in children. The raw data was then tabulated and analysed using Microsoft Excel®.

Results
A total of 50 patients initiated on enoxaparin were included. 29 patients (58%) were started on enoxaparin based on ECG results such as T wave inversion and ST segment depression while 9 patients (18%) were started on enoxaparin based on symptoms that they experienced including chest pain radiating to jaw and arm, sweating and shortness of breath. Another 7 patients were started based on combination of symptoms and ECG changes.

It was found that 39 patients (78%) had their weight documented, either estimated or weighed. 30 patients (60%) had the correct dose prescribed according to their weights, 11 patients (22%) had no weight recorded and no dose prescribed and 9 patients (18%) were prescribed with estimated dose and required dose adjustment. 4 patients had their dose adjusted according to their weights and 5 patients did not. There was no documentation, either in the clinical notes or the drug charts of forty-four patients (88%). Only six patients (12%) had the length of therapy stated on their drug charts. Five patients that were documented with length of therapy were reviewed within the time stated and appropriate action taken (Table 1).

Of the total 50 patients, 39 patients (78%) were reviewed within 48 hours while 11 patients (22%) were not. Out of the 39 patients, enoxaparin were stopped in 26 patients, continued in 8 patients while the remaining 5 patients continued the therapy with no clear documentation. Table 2 shows the comparison of audit standards and results.

Table 1: Documentation of duration of enoxaparin

<table>
<thead>
<tr>
<th>Documentation on drug chart</th>
<th>No. of patients</th>
<th>Percentage (%)</th>
<th>Reviewed and action taken within stated time?</th>
</tr>
</thead>
<tbody>
<tr>
<td>No documentation</td>
<td>44</td>
<td>88</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 hours</td>
<td>4</td>
<td>8</td>
<td>Yes</td>
</tr>
<tr>
<td>72 hours</td>
<td>1</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>Until troponin levels</td>
<td>1</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Comparison of audit standards and results (n=50)

<table>
<thead>
<tr>
<th>Audit standard</th>
<th>Target (%)</th>
<th>Achieved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enoxaparin initiated with appropriate diagnosis and documented</td>
<td>100</td>
<td>94</td>
</tr>
<tr>
<td>Correct dose of enoxaparin prescribed according to weight</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Enoxaparin reviewed within 48 hours</td>
<td>100</td>
<td>78</td>
</tr>
<tr>
<td>Concurrent anti-platelet therapy</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion
This audit demonstrated that high numbers of patients were started on enoxaparin based on appropriate diagnosis. It had been highlighted that there were insufficient recordings of weight for ACS patients. This information is important for clinical pharmacists to validate the prescription and to ensure the correct dosage was given. The actual weighing of the patients might be the main limiting step as it can be inconvenient to the prescribers, especially during ward round due to time constraints. The prescribers will need to appreciate the importance of weight especially when the drug relies on weight for a dosage. It was observed where there was no dose prescribed due to delay in weighing; treatment was then delayed. This could potentially put the patient at risk of recurring ischaemic episode. Dose adjustments and weight recordings were made following pharmacists' interventions. Unfortunately not all patients were reviewed within 48 hours. The remaining patients could very well been reviewed by clinicians but there was no documentation found. It had come to light during the audit that the prescribing of combination anti-platelets was less than expected, however this audit was not designed to investigate this. Recommendations from this audit include: present the audit findings to medical and pharmacy teams, education and training for prescribers, produce a bulletin with relevant prescribing information.

References
3 Summary of Product Information for Clexane, Sanofi Aventis, published May 2007

30 Auditing the use of stress ulcer prophylaxis in critically ill patients on an intensive care ward

Hughes S
Pharmacy Department, North West Wales NHS Trust, Bangor.
In conjunction with Cardiff University Diploma in Clinical Pharmacy

Introduction
Stress ulceration has been identified as one of the complications of most serious concern in critically ill patients. Stress ulceration can contribute to morbidity and mortality and is the most common cause of gastrointestinal bleeding on intensive care units (ICUs).

Previous studies have shown that there is no consistency of stress ulcer prophylaxis prescribing and that unnecessary therapy is continued when patients are discharged from ICU.

At present there is no national guidance for stress ulcer prophylaxis. The following guideline exists at North West Wales NHS trust for stress ulcer prophylaxis in critically ill patients:

Ensure patients are enterally fed where possible

If on enteral feeds: Omeprazole 40mg nasogastrically (NG) once daily
If NOT enterally fed: Ranitidine 50mg intravenously (IV) three times a day
If already on a proton pump inhibitor: Omeprazole 40mg IV once daily

Aims and objectives
The aim of the audit was to determine whether the guideline for stress ulcer prophylaxis was being adhered to within ICU at North West Wales NHS trust and to follow up any stress ulcer prophylaxis once a patient is discharged from ICU. Standards were 100% compliance with the trust guideline and 100% discontinuation of unnecessary gastro-protection...
when patients are discharged from ICU at time of audit. The objective was to use the audit to measure the achievement of the standards and achieve 100% compliance by January 2009.

Method
Approval was sought from the audit department. Data was collected by looking at patient medication charts. Nurses were questioned and it was recorded how patients were fed. To eliminate prescribing bias, ICU staff were unaware that data collection was taking place.

Data was collected over a six week period during October and November 2007. Every patient seen on ICU by a pharmacist was included in the audit. There was no exclusion criteria.

Following discharge from ICU, patients were followed up to monitor stress ulcer prophylaxis prescriptions. Medication charts were inspected for gastro-protective medicines while inpatients and discharge prescriptions examined when patients were discharged from hospital. A check was made in the medical notes for any documentation as to intentions with stress ulcer prophylaxis.

Results
Data was collected for 45 patients. Ninety three percent of patients were prescribed a form of stress ulcer prophylaxis. The majority of patients (n=43) were prescribed stress ulcer prophylaxis within 24 hours of ICU admission. The most commonly prescribed agent was omeprazole intravenous injection.

<table>
<thead>
<tr>
<th>Group Number</th>
<th>Patient Types</th>
<th>Compliance with NWW NHS Trust guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enterally fed</td>
<td>18%</td>
</tr>
<tr>
<td>2</td>
<td>Not enterally fed</td>
<td>30%</td>
</tr>
<tr>
<td>3</td>
<td>Patients already on Proton Pump Inhibitors</td>
<td>72%</td>
</tr>
</tbody>
</table>

Other therapies for group 1: Twelve patients received enteral feeding. Compliance with the guideline was 18% (n=2). Omeprazole IV 40mg daily was prescribed for 55% (n=6) patients, 9% (n=2) of patients received omeprazole IV 40mg twice daily, 9% of patients received ranitidine 50mg IV three times daily. No form of 9% of stress ulcer prophylaxis was prescribed for 9% of patients.

Other therapies for group 2: Ten patients (50%) were prescribed omeprazole 40mg IV daily, 10% of patients received omeprazole 40mg IV twice daily and 10% of patients did not receive stress ulcer prophylaxis.

There was a 50% (n=4) increase in the number of patients discharged from hospital on a gastro-protective agent in comparison to being admitted to hospital on gastro-protection. For 58% of patients there was no documentation in the medical notes as to why they were discharged on gastro-protection or why their therapy prior to admission was changed.

Discussion
From the results obtained it can be concluded that although prescribing of stress ulcer prophylaxis on ICU was good (93%), what is being prescribed does not comply with the current guideline.

Omeprazole was the most commonly used agent. The reasoning may be that it is a newer agent and has not been proven to be associated with ventilator acquired pneumonia (unlike ranitidine). However, omeprazole injection is the most expensive of the three therapies therefore adherence with the guideline would result in more cost-effective prescribing. Compliance with the trust guideline would ensure an ICU cost saving of approximately £13,000 per annum.

This audit supported the findings of another study showing that patients were continuing on stress ulcer prophylaxis after discharge from ICU without intention documented in the medical notes.

It is recommended that there should be education (doctors, nurses and pharmacists) to raise awareness of the guideline. Due to trust rotation of junior doctors, it would also be advisable to design an all Wales stress ulcer prophylaxis guideline to ensure consistency of prescribing.

Another strong recommendation is that the guideline should be amended to include instruction that stress ulcer prophylaxis should be discontinued when a patient is discharged from ICU unless there is a valid reason and this valid reason should be clearly documented in the medical notes.

References:

31 Assessing the adherence and impact of an insulin near-patient supply policy from a diabetic outpatient clinic

Yerbury P, Boyce M
Pharmacy Department, King’s College Hospital NHS Foundation Trust

Introduction
Prior to May 2005, diabetic outpatients within our Trust requiring initiation of insulin were issued with an FP10 prescription after a Doctor’s consultation. The patient then presented the FP10 to their local pharmacy. The GP was written to, and asked to continue the insulin prescription. This practice had many disadvantages including; lack of specialist patient counselling, familiarisation with insulin therapy, delays in obtaining supplies, over prescribing leading to unnecessary FP10 costs (found after financial analysis), potential delays with GPs communication and Diabetic Specialist Nurses (DSNs) not being able to fulfil their roles adequately. DSNs reported patients received incorrect insulins from community pharmacies, which has been highlighted by a national risk agency1. NICE has endorsed education should be tailored to the needs of different diabetic groups and should include, as a minimum, a DSN with knowledge of the principles of patient education.

In May 2005, a multidisciplinary team met to develop a new initiative. As a result, a near-patient education and supply service was proposed. This service was agreed between the Clinicians (Doctors, DSNs), the lead pharmacist for Medicine and local Primary Care Prescribing Advisors. It was endorsed by local Formulary and Medicines Management Committees and became the new near patient policy. Hereby, doctors would review patients’ diabetic control and prescribe a single vial / device of each insulin on a Hospital Out-patient Prescription (HOP) as opposed to an FP10. After the doctor consultation, a DSN would counsel the patient and supply the insulin against the HOP and record supplies in a logbook. Copies of these HOPs were retained for auditing purposes.

Objectives
1. Monitor the doctors and DSNs adherence to the policy in respect to prescribing and supplying of insulin respectively
2. Realise the financial impact of the policy
3. Identify the perceived benefits from the policy main users, namely the DSNs

Method
An audit was undertaken of the HOPs retained between November 2005 and September 2006. Audit standards were:

- 100% adherence to the policy by doctors in respect to prescribing a single vial /device prescribed per prescription
- All logbook entries were fully completed by the DSNs
A cost review of FP10 insulin prescriptions and insulin stock issued to the Diabetic Outpatient Clinic (DOC) since May 2004, using the Prescription Pricing Authority and pharmacy computer databases respectively was undertaken. Analysis of these costs enabled identification of cost savings. Opinions of the DSNs were sought to determine their benefits.

Results
A total of 457 prescriptions were analysed between November 2005 and September 2006. 429 (94%) fully adhered to the policy whereby only one vial / device per prescription was prescribed. Analysis of the logbook revealed that of the 661 entries made, 196 (30%) were fully complete. The remainder lacked full data as required under the policy. Cost analysis revealed the value of insulins on FP10 prescriptions reduced from £21,377 prior to implementation, to £1,685 by the third year post implementation. This was due to patients being issued with cartridges directly from the clinic, as opposed to being prescribed as original packs on an FP10. The value of insulin supplied to the clinic thereby increased from £3,579 to £4,561 over the 3 years due to the changes in the supply process, in that they were now being made from the clinic. Overall yearly cost savings were 39%, 70% and 75% respectively (Table 1).

The main advantages of the policy described by 3 of the DSNs included:

- Avoidance of delay in commencing insulin therapy
- Ability for DSNs to demonstrate the various devices available
- Ability to observe patients self administering the first injection and overcoming fears
- Increased consultation and educational time with nursing staff
- Provide more focused patient support

Specific comments made by DSNs included:

- ‘It is good for patients who start on insulin, as they can leave clinic with their insulin and devices and can start therapy the same day rather than worrying about obtaining insulin from a pharmacy, which may mean a delay in starting to give that first injection on their own’.
- ‘It is really important to observe a patient undertaking their first injection - it overcomes their fear. If they waited until they got home they may be reluctant to

Table 1. Costs of FP10 and insulin supplies pre and post implementation

<table>
<thead>
<tr>
<th>Dates</th>
<th>FP10 (€)</th>
<th>Clinic stock issues (€)</th>
<th>Total (€)</th>
<th>Saving (€)</th>
<th>Saving (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2004-April 2005</td>
<td>21,377</td>
<td>3,579</td>
<td>24,956</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 2005-April 2006</td>
<td>11,180</td>
<td>4,121</td>
<td>15,301</td>
<td>9,655</td>
<td>39</td>
</tr>
<tr>
<td>May 2006-April 2007</td>
<td>2,929</td>
<td>4,511</td>
<td>7,440</td>
<td>17,516</td>
<td>70</td>
</tr>
<tr>
<td>May 2007-April 2008</td>
<td>1,685</td>
<td>4,561</td>
<td>6,246</td>
<td>18,710</td>
<td>75</td>
</tr>
</tbody>
</table>

Discussion and Conclusion
Adherence to the policy by doctors was high, regarding the volume of each item requested per prescription. The DSNs were less compliant with the completion of the logbook entries. As a result, the policy has been simplified regarding the logbook completion (batch numbers are no longer necessary). In addition the supply is now made against Drs written instructions from the patients’ notes following their consultation. This still allows provision of an audit trail. The implementation of this policy has resulted in FP10 expenditure falling from £21,377 to £1,685 (92%) overall reduction. The cost of insulin supplied to the DOC has increased, from £3,579 to £4,561 (27%) over the 3 years.

Although documentation could have been better, this near patient supply policy has been well received by the DSNs. The DSNs believe this new policy results in patients leaving the DOC with a greater understanding of insulin therapy, their fears are allayed and they are reassured with a point-of-contact for continuing advice and support. Direct supplying enables patients to leave with the correct insulin, in the most appropriate device ready for self-administration. Future work will look at developing a patient satisfaction survey.

References:
Pfizer Ltd Regional Preregistration Pharmacists winning posters 2008

A Baseline audit to determine staff awareness of oral chemotherapy in a non-oncology/haematology environment

Wong A
Hull and East Yorkshire Hospitals NHS Trust

Introduction
The majority of NHS clinical care is of a very high standard. In comparison to the volume of work provided, serious errors are uncommon. The introduction of Clinical Governance and the National Patient Safety Agency (NPSA) encouraged organizations to focus on risk management, patient safety and to improve local and national reporting systems. ‘Building a Safer NHS for Patients’ identifies specific groups of medicines that are more prone to errors and require particular attention, such as cancer chemotherapy. The number of oral chemotherapy agents has significantly increased over the last decade, contributing to a shift from parenteral to oral therapy. These medicines are increasingly used in hospital and community, but risks increase when non-specialist practitioners prescribe, dispense or administer them. The NPSA Rapid Response Report highlights the risks of incorrect use and incidents reported between November 2003 and July 2007. The report includes a list of action points which NHS Trusts must comply with by 22nd July 2008.

Objectives
- To determine staff awareness of the Trust’s Oral Chemotherapy Policy in non-oncology/haematology areas at Hull Royal Infirmary (HRI) and Castle Hill Hospital (CHH).
- To carry out a baseline inspection of oral chemotherapy posters on specified wards, survey staff of knowledge and awareness of current policy and poster and review drug charts for appropriate prescribing of oral chemotherapy and adherence to pharmacy guidelines.

Trust policy
All prescriptions for new oral chemotherapy treatment should only be written by a consultant or specialist registrar. If the patient is already taking chronic or continuous oral chemotherapy, it must not be administered until the correct dose has been confirmed by a pharmacist or member of the specialist team. If medical staff are in any doubt they should not proceed and must seek specialist advice.

Method
Data was collected over 3 months from all patients admitted to non-specialist wards at both sites (32 in total) on oral chemotherapy. Confidential questionnaires and drug chart screening were used as audit tools. Data was obtained by assessing 2 nurses at random per ward with closed questions on the current policy and resource poster. Screening of drug charts involved recording the following details: admission date, site, ward, ward type, drug name, dose confirmed, dose confirmation dated and dose administered. Data was analysed using Microsoft Excel®. There was no direct patient involvement.

Results
64 nurses were interviewed in total, 62% at HRI were aware of the policy, compared to 40% at CHH. 72% at HRI and 49% at CHH were not aware of the existence of a resource poster and whether it was displayed on the ward. The majority of nurses at both sites (75% HRI, 63% CHH) were not aware of the content of the poster, but were able to suggest the purpose of the poster; such as staff awareness, to explain the policy and a source of referral.

Table 1: Summary of the findings across both sites

<table>
<thead>
<tr>
<th>Oral chemotherapy</th>
<th>Dose confirmed</th>
<th>Confirmation dated</th>
<th>Drug administered</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Methotrexate (n = 12)</td>
<td>9</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Mercaptopurine (n = 1)</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hydroxyurea (n = 8)</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Cyclophosphamide (n = 8)</td>
<td>7</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Melphalan (n = 1)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>7</td>
<td>18</td>
</tr>
</tbody>
</table>

30 drug charts were screened in total across the 2 sites (Table 1). There were 4 cases of non-compliance to the Trust Policy involving methotrexate, cyclophosphamide and 2 with hydroxyurea. The dose was administered prior to a dose confirmation by a member of the specialist team or pharmacist.

Overall 77% of drug charts had the dose confirmed. 60% of drug charts had the dose confirmation dated. 13% of drug charts had the dose administered prior to a dose confirmation by a pharmacist. A comparison of the 2 sites showed that 89% at HRI and 55% at CHH had the dose confirmed and 68% at HRI and 45% at CHH had the dose confirmation dated. Three cases of non-compliance occurred at CHH and one case at HRI. The difference was marginal between surgical and medical wards.

Discussion
The audit demonstrated a low level of awareness of both the policy and resource poster on non-specialist wards. Many nurses had either not read the policy or had forgotten it, although many suggested that it was not necessary for such specialist medication. The NPSA report states that particular attention is essential for high risk drugs and the main concern is with non-specialist practitioners. New posters were often displayed without the knowledge of ward staff and many found it difficult to distinguish between new and old posters. Further comments however verified the posters as useful sources of information, although limited ward space was a problem. Suggestions to improve the system of distribution/removal of posters may be beneficial.

Investigation of the standard of current practice showed a high proportion of drug charts were confirmed by a pharmacist and most were dated, although this is not mandatory in the current policy. The lack of awareness extends to non-specialist prescribers with several incidents involving incorrect dosing. A major limitation of the audit was not involving medical staff.

Recommendations include amendment of current policy to include the confirmation date for identifying adherence to policy and enabling errors to be traced. Alert charge nurses when new posters have been issued and to communicate this to all ward staff. Dissemination of results to Trust Committees by July 2008, implementation of an action plan and to re-audit post NPSA deadline.

Acknowledgements
Sarah Scargill - Audit Supervisor, David Corral - Chief Pharmacist, James Illingworth, Simon Gaines and Pharmacy Department at Hull Royal Infirmary and Castle Hill Hospital.

References
Assessment of omitted medication doses at University Hospital of North Tees

Aslam A; Carr G; Robson J
Pharmacy Department, University Hospital of North Tees, Stockton-On-Tees

Introduction
Medication errors are among the most common inadvertent events that a patient can experience whilst in hospital. The Department of Health (DoH) has defined a medication error as 'any preventable event that may cause or lead to inappropriate medication use or patient harm'. Medication errors have been shown to account for approximately 20% of all hospital deaths due to an adverse event. Many clinical pharmacy activities are targeted at reducing medication errors and improving pharmaceutical care for individual patients. As part of the clinical pharmacy quality programme at this Trust, it was decided that the omission of prescribed doses could be an important patient-related outcome, which should be evaluated as the extent and significance of the missed doses was unknown.

Objectives
1. To identify the total number of missed doses of regular medicines.
2. To determine the cause(s) of omitted doses.
3. To produce an educational tool to reduce the number of omitted doses.

Method
The audit was carried out on four wards, each from different specialties (Medicine (M), Elderly care (EC), and Orthopaedics (O)). These represented the major clinical based areas within the hospital and include 31% of the adult wards within the hospital. Two of the four wards were serviced by a one-stop system (OS) whilst the other two wards were conventional wards (CP). Data was collected from ten drug charts randomly selected from each ward. The total number of regular doses prescribed, and omitted, on all drug charts over the previous seven days were counted and recorded. Items which met the following criteria were excluded: drug charts that were no longer in use, discontinued items, once only medications, when required medications, large volume infusions and medication prescribed via a syringe driver. An educational tool was designed for nursing staff to follow when medication was unavailable. This was given to each of the audit wards, who were requested to place the tool on the drug trolley or medicine cupboard. After 8 weeks the audit was repeated on the same wards.

Results
Data from 40 patients was collected in each arm of the audit. A total of 3,223 doses were prescribed in the pre-audit arm. 816 (25.3%) of these doses had either not been recorded as administered (administration box left blank) or had been omitted. In contrast a total of 3,042 doses had been prescribed in the post-audit arm, of which 561 (18.4%) had been omitted. Table 1 provides a breakdown of the results from both pre- and post-audit.

In the pre-audit, a total of 324 (16.6%) doses were omitted on the OS wards compared to 492 (40.1%) doses omitted on the CP wards. In contrast the post audit showed a significant reduction in omitted doses on both types of wards. 195 (10.3%) doses were omitted on OS wards whereas 366 (31.8%) were omitted on CP wards. Table 2 provides a detailed breakdown of omitted doses for individual wards.

Discussion
Compliance with the Trust's policy administration of medicines was higher on the OS wards than on CP wards. The OS service reduced ambiguity and errors on the kardex through effective clinical checking by Pharmacists. Also, ordering of drugs by technicians reduced problems arising from stock shortages. This factor was a major contributor towards the performance of the OS wards and demonstrated that CP wards would benefit greatly from this service too. The dissemination of the educational interventions had a positive impact on the performance of the CP wards as the number of omitted doses reduced from 40.1% to 31.8%, which showed that a simple tool explaining the action to undertake in the event of medication being unavailable could help to reduce the number of omitted doses. As a result of this study, we now have a better understanding of the incidence and causes of patients missing prescribed medication on our wards. It is to repeat the audit on a wider basis to identify the need for further interventions.

References
2 Audit Commission. A spoonful of sugar - Medicines Management in NHS hospitals; 2001

Table 1: Reasons for omission of dose

<table>
<thead>
<tr>
<th>Reason for omitted dose</th>
<th>Pre Audit Number of omitted doses (% of prescribed doses)</th>
<th>Post Audit Number of omitted doses (% of prescribed doses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug unavailable</td>
<td>555 (17.2)</td>
<td>372 (12.2)</td>
</tr>
<tr>
<td>Blank (no reason)</td>
<td>209 (6.5)</td>
<td>121 (4.0)</td>
</tr>
<tr>
<td>Patient refused</td>
<td>21 (0.7)</td>
<td>29 (1.0)</td>
</tr>
<tr>
<td>Patient unavailable</td>
<td>12 (0.3)</td>
<td>15 (0.5)</td>
</tr>
<tr>
<td>Clinical reasons</td>
<td>19 (0.6)</td>
<td>24 (0.8)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>816 (25.3%)</td>
<td>561 (18.5%)</td>
</tr>
</tbody>
</table>

Table 2: Breakdown of omitted doses for individual wards

<table>
<thead>
<tr>
<th>Ward</th>
<th>Pre Audit Number of omitted doses (% of prescribed doses)</th>
<th>Post Audit Number of omitted doses (% of prescribed doses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (EC – OS)</td>
<td>177 (19.7)</td>
<td>118 (11.6)</td>
</tr>
<tr>
<td>2 (M – OS)</td>
<td>147 (13.9)</td>
<td>77 (8.8)</td>
</tr>
<tr>
<td>3 (O – CP)</td>
<td>233 (41.2)</td>
<td>164 (33.5)</td>
</tr>
<tr>
<td>4 (EC – CP)</td>
<td>259 (36.8)</td>
<td>202 (30.5)</td>
</tr>
</tbody>
</table>

Prescribing of intravenous fluids on paediatric wards at St Mary's Hospital

Greenwood C, Fletcher P, Corda L, Charles T
Imperial College Healthcare NHS Trust, London

Introduction
Severe hyponatraemia (serum sodium <130 mmol/L) is a potential complication of fluid therapy in children. Any child receiving fluids may be at risk although contributing factors include administration of hypotonic fluids, a clinical condition with impaired free water excretion or high anti-diuretic hormone levels, or gastro-intestinal fluid losses. Clinical signs of hyponatraemia are non-specific and include nausea, malaise and headache but a severe hyponatraemic state can lead to cerebral oedema, seizures and death. Since 2000, there have been four deaths within the UK following neurological injury as a result of hyponatraemia.

The increase in incidence of hospital-acquired hyponatraemia prompted the National Patient Safety Association (NPSA) Alert (Number 22, 2007) on how to minimise risk when administering
intravenous fluids to children (1 month -16 years, excluding critical care). The NPSA recommended the removal of hypotonic sodium chloride 0.18% with glucose 4% from wards, the introduction of clinical guidelines, training of all staff and promotion of incident reporting.

**Objectives**

To analyse prescribing of intravenous fluids on paediatric wards to identify whether prescribing and monitoring adheres to St Mary’s Hospital Paediatric Intravenous Fluid Guidelines (October 2007) and to suggest strategies to improve areas of non-compliance.

**Standards**

100% of children (>1 month) are prescribed fluids as per guidelines: either sodium chloride 0.45% with glucose 5%, or sodium chloride 0.9% with/without glucose if patient has a higher risk of developing hyponatraemia.

100% of children are monitored daily with regards to electrolytes, weight, fluid balance and glucose (if glucose-free solution infused).

0% of all prescriptions indicate potassium ampoules being added to a fluid bag.

100% of prescriptions are screened by the pharmacist.

**Method**

Patient notes, fluid prescriptions and pathology results were used to collect data on two wards between 29th November 2007 and 11th February 2008. Patients less than one month old, or older than 16 were excluded.

Data were analysed using Microsoft Excel and results discussed with a paediatric registrar to clarify the appropriateness of the prescription.

**Results**

There were 37 eligible patients – 35 had a medical diagnosis and 2 were undergoing surgery. Adherence to each key component of the guideline is summarised in Table 1.

**Discussion**

Although no adverse outcomes were reported, adherence to guidelines was low. There were some good examples of fluid management where monitoring prompted change of fluid therapy and all factors, as per guidelines, were taken into consideration. However, for some patients (n = 12, 32%) the initial fluid prescribed was not appropriate. Five patients had a fluid bag containing potassium, although no potassium levels had been taken prior to this. Five patients, who had electrolytes measured prior to infusion with a low potassium result, did not receive fluids containing potassium. One patient was prescribed fluid that was not outlined in the guidelines (Hartmanns) and three patients had a low sodium level that warranted higher initial sodium content because they were at risk of developing hyponatraemia.

The majority were correct (n = 16, 76%) but there were evidently some patients that continued to be prescribed inappropriate fluid, not in accordance with Trust guidelines.

Achievement of the audit standards was low. There was one standard met by all patients - there were no instances where potassium ampoules were being added to fluid bags. Ampoules are only kept as stock on the specialist wards and should not be routinely added to fluid bags.

No prescriptions were signed by the pharmacist. This reluctance, whether due to lack of experience or knowledge, needs to be addressed. All fluids are included in the BNF and the pharmacist is responsible to check they are appropriate and help reduce risk in accordance with the NPSA alert.

Implementation of the guidelines has so far been incomplete. This could be due to lack of awareness and training of staff or hindrances to implementation that were previously not known. For example taking daily weights or recording accurate urine losses.

The sample number was small and the audit was soon after the guidelines had been introduced. However, guidelines were in all patient bed-side folders and the study period included a changeover of doctors where there was an opportunity to disseminate the guidelines.

**Table 1: Adherence to guidelines (37 patients)**

<table>
<thead>
<tr>
<th>Guideline adherence question</th>
<th>Total</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Was initial intravenous fluid composition appropriate?</td>
<td>37</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>b. How many were prescribed sodium chloride 0.9%?</td>
<td>37</td>
<td>33</td>
<td>3</td>
</tr>
<tr>
<td>c. How many could have had 0.9% as per guidelines?</td>
<td>37</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>d. Was there a change in fluids?</td>
<td>37</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>e. Was this change appropriate?</td>
<td>21</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>f. Were electrolytes taken before infusion?</td>
<td>37</td>
<td>28</td>
<td>9</td>
</tr>
<tr>
<td>g. Were electrolytes measured at least every 24 hours during infusion?</td>
<td>37</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>h. Was a daily weight documented?</td>
<td>37</td>
<td>43</td>
<td>33</td>
</tr>
<tr>
<td>i. If applicable, was glucose measured?</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>j. Was fluid balance documented accurately and fully?</td>
<td>37</td>
<td>22</td>
<td>15</td>
</tr>
</tbody>
</table>

Suggestions for improvements include a meeting for paediatric staff to identify the difficulties and possible solutions in implementation of the guidelines and a re-design of prescription charts to facilitate prescribing and monitoring, as suggested by NPSA. It would also be beneficial to have a training session for pharmacists and a re-audit, of a larger scale, once changes have been introduced to improve present practice.

**References**


---

**Are the splenectomy guidelines being followed at Southampton University Hospitals Trust?**

**Burnup JL**

Southampton University Hospitals Trust, Southampton

**Introduction**

The spleen is a blood rich organ, which makes up part of the lymphatic system. It is located on the left hand side of the abdominal cavity, where it curls around part of the stomach. The spleen has many functions, with the main one being to filter the blood and to remove bacteria, viruses and other debris by phagocytosis. Other functions include destroying old red blood cells and recycling their break down products and initiating immune response by B and T cells in response to circulating antigens.

The spleen is surrounded by a very fragile capsule and is therefore torn very easily. Even minor blows to the left side of the abdomen can cause the spleen to rupture; this can lead to serious internal bleeding and eventual circulatory shock. As well as following trauma, the spleen is often removed in order to gain access to other organs during surgery, in particular the stomach, left kidney and left side of the colon. In these circumstances the spleen that is removed may well be perfectly healthy.

Patients who have undergone a splenectomy are at a significantly increased risk of over whelming infection, particularly from Streptococcus pneumoniae, Haemophilus influenza and Neisseria meningitides. The British Committee for Standards in Haematology (BCSH) has produced guidance recommending that all splenectomy patients receive the Pneumovax II and Menitrix vaccines either 2 weeks pre or 2 weeks post splenectomy. The Pneumovax II vaccine provides immunity against S.
pneumoniae, whilst the Menitoxir vaccine is made up of the H. influenzae type B vaccine and the Meningococcal group C vaccine. Patients should also be discharged with life-long antibiotic prophylaxis, usually penicillin V, and an emergency course of antibiotics. This should be taken if the patient develops any signs of an infection, such a fever. As well as this, the patient should be sent home with a letter to be given to their General Practitioner (GP), explaining that they have had their spleen removed and their need for life long antibiotic prophylaxis and their vaccines.

Local guidelines for Southampton University Hospitals NHS Trust (SUHT) have been produced based on these national guidelines. This audit aimed to investigate if these guidelines are being followed at SUHT.

**Objectives**

1. To identify all patients, who have had a splenectomy at SUHT, within the last year (1st August 2006–31st July 2007).
2. To determine if the patients received their vaccines whilst in hospital or if they should have been given by the GP.
3. If the vaccines were not given in hospital, to determine if the vaccines were actually given by the GP.
4. If the vaccines were not administered, to investigate why they were not given.
5. To determine if patients were discharged from hospital with prophylactic antibiotics and emergency antibiotics.

**Method**

All patients who had a splenectomy at SUHT in the last year were identified. The hospital notes of these patients were looked at to determine if the vaccines were administered whilst the patient was in hospital. Letters were sent out to the General Practitioners (GPs) of all those patients, who had not received the vaccines in hospital, asking if and when the vaccines were given. All data obtained was recorded on a data collection form and the results were then analysed.

**Results**

There were 26 patients, who had a splenectomy at SUHT in the past year. Only 2 patients (7.7%) did not receive the vaccines that they required. These patients should have had both vaccinations administered by their GP, but they both only received the Pneumovax II vaccine and not the Menitoxir vaccine. All patients received life-long antibiotic prophylaxis, but only 14.3% of patients were discharged with a course of emergency antibiotics.

**Discussion**

Out of the 26 patients, who had undergone a splenectomy, only 22 needed to receive both immunisations. In the case of 2 patients out of the 26, they had only undergone partial splenectomy operations. The other patients, who did not require the vaccines unfortunately died between 2 and 10 days after their splenectomy operations.

For 1 patient, the information regarding the administration of the vaccines has not been obtained. The GP of this patient was unwilling to give out the information without patient consent, despite the fact that consent was not required for this audit.

After contacting all relevant GP Surgeries, it appeared that 2 patients had only received the Pneumovax II vaccine and had not received the Menitoxir vaccine. One of these patients had been seen in the pre-assessment clinic and was given the Pneumovax II 2 weeks before the operation, whilst the other patient was given the Pneumovax II after the splenectomy.

All patients, who required them, were discharged with prophylactic antibiotics. However, only 3 (14.3%) were discharged with emergency antibiotics. This has been attributed to a lack of knowledge of this requirement amongst staff.

The results showed that 92% of patients did have the required vaccines. In order to make sure all patients receive their immunisations the following recommendations have been made:

- Reword the post-splenectomy letter so that there is also a letter available for patients being seen in pre-assessment and who are able to have their vaccinations pre-operatively.
- Using the new e-discharge system, send the splenectomy letter directly to the GP, with the TTO, as well as via the patient.
- Write a very small feature, in the monthly PCT newsletter, on treatment post-splenectomy to remind GPs of the need to give both vaccinations.
- Re-educate about the need for an emergency course of antibiotics.

**References**


E

An audit of the use of docetaxel (Taxotere) at the Norfolk and Norwich University Hospital

Jackson P, Supervisor: Small M, Specialist Oncology Pharmacist
Norfolk and Norwich University Hospital, Norwich

**Introduction**

Lung, breast, and prostate cancers together account for 41% of all new diagnoses of cancer and 37% of all cancer deaths in the UK. Docetaxel is an antineoplastic agent approved for use within the Norfolk and Norwich University Hospitals (NNUH) NHS Foundation Trust in accordance with the guidance issued by the National Institute for Health and Clinical Excellence (NICE) for the treatment of early and locally advanced or metastatic breast cancer1, hormone-refractory metastatic prostate cancer2, and non-small cell lung cancer (NSCLC)3. It has also been approved for use by the Trust's Drugs, Therapeutics and Medicines Management (DTMM) Committee as part of the FEC-T regimen (sequential use of 3 cycles of fluorouracil, epirubicin and cyclophosphamide followed by 3 cycles of docetaxel) for the adjuvant treatment of early node-positive breast cancer in high risk patients4.

Annual expenditure on docetaxel at the NNUH is in the region of £300 000. Given the finite resources of the National Health Service (NHS), the increasing demand for NHS Trusts to provide evidence of the appropriate use of high cost drugs to secure ongoing funding, and the imminent extension of ‘Payment by Results’ to cancer therapies, an audit of the drug’s use is timely. Additional impetus for ensuring appropriate drug use is provided by the proposed NHS Constitution5 which gives patients the fundamental right to all NICE-approved therapies, and the importance of auditing local compliance with national guidance is further reinforced by both NICE6 and, more recently, by the Department of Health7.

**Objectives**

To investigate the extent to which the use of docetaxel at the NNUH adhered to the NICE guidance for early and advanced breast cancer, hormone-refractory metastatic prostate cancer and NSCLC and, in cases where non-adherent use was identified, to assess whether approval for its use had been sought from the Trust’s DTMM Committee.

**Method**

All patients prescribed docetaxel within the 6 months to 30/09/07 were identified using the Med Oncology® chemotherapy prescribing system. Data for each patient was retrieved manually from Oncology Notes®, an
An audit of compliance with hospital guidelines for insulin prescribing

Singh N
Department of Pharmacy, Northern Devon Healthcare NHS Trust, Barnstaple

Introduction
Insulin is one of the top five high risk medications used within hospitals. Poor control of hyperglycaemia and the risk of hypoglycaemia are regarded as patient safety issues. Medication errors involving insulin can occur at any stage in the process of prescribing, preparing and administering medications to the patient. Errors in insulin prescribing have led to a number of patient deaths.

Objectives
The aim of the audit was to look at the quality of insulin prescribing at North Devon District Hospital (NDDH) and assess the extent to which prescribers are adhering to the hospital policy.

Method
Fourteen standards were adapted from the North Devon Hospital Medicines Policy and hospital formulary for which the target compliance was 100%. (Table 1) Approval was obtained from the Clinical Audit team for patients’ drug charts to be reviewed by the study investigator. A data

<table>
<thead>
<tr>
<th>Table 1: The fourteen audit standards8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard</strong></td>
</tr>
<tr>
<td>1 All insulin prescribed states the medicine name e.g. Mixture 30 not “INSULIN”</td>
</tr>
<tr>
<td>2 All insulin prescribed states the route of administration</td>
</tr>
<tr>
<td>3 All insulin prescribed specifies whether a vial, cartridge or pen is required</td>
</tr>
<tr>
<td>4 All insulin prescribed state the administration times</td>
</tr>
<tr>
<td>5 All insulin prescribed is signed and dated by the prescribing doctor</td>
</tr>
<tr>
<td>6 All insulin is prescribed on the inpatient drug chart in the regular prescription section</td>
</tr>
<tr>
<td>7 A reference is made to the separate insulin administration sheet on the inpatient drug chart</td>
</tr>
<tr>
<td>8 All insulin is prescribed on a separate insulin administration sheet with the dose specified</td>
</tr>
<tr>
<td>9 All insulin is prescribed on a separate insulin administration sheet is signed by the doctor</td>
</tr>
<tr>
<td>10 All insulin is prescribed legally and legibly, stating the dose as UNITS and not “IU”</td>
</tr>
<tr>
<td>11 The insulin administration sheet is attached to the inpatient drug chart</td>
</tr>
<tr>
<td>12 Medical staff administrating insulin doses to the patient should sign the attached sheet to show when the patient has received a dose</td>
</tr>
<tr>
<td>13 All doses should be given</td>
</tr>
<tr>
<td>14 If the patient is self-administering their insulin – a risk assessment should be carried out and documented in the notes. The patient’s insulin should be locked away.</td>
</tr>
</tbody>
</table>

References

Figure 1: Adherence of docetaxel use to national and local guidance by indication (n=51)
collection form was designed and piloted with three inpatient prescription charts for insulin prior to the commencement of the study. The data collection form was refined further, based on the pilot period. Data was collected prospectively and the analysis was performed daily on inpatient prescription charts at NDDH from 07/01/08 to 22/02/08.

Results
Of the fifty insulin prescriptions reviewed, only one was prescribed completely and correctly as stated in the North Devon Hospital Medicines Policy and Formulary. The target compliance of 100% was not achieved for any of the fourteen standards. Overall standards 13, 4, 5 and 6 had the highest rate of compliance with 86% for standard 13 and 84% for standards 4, 5 and 6. Standards 14, 3 and 11 had the lowest rate of compliance with 0%, 4% and 18% respectively.

Discussion
The audit identified that there is poor compliance with the hospital guidelines. On a significant number of occasions information was omitted from the insulin prescription which could contribute to a medication error therefore insulin prescribing practices need to be improved to enhance patient safety.

Promotion of correct insulin prescribing within the hospital is necessary. It is essential to educate the junior medical staff, who are less familiar with the North Devon Hospital Formulary and Medicines Policy. Guidance on insulin prescribing and the use of the administration sheet should be distributed to medical staff at their induction. Also the insulin administration sheet should be reviewed with the intention of changing its layout so that it is clearer and easier for doctors to prescribe insulin. Once the insulin administration sheet has been modified and implemented throughout the hospital, a re-audit against the same standards used in this study could then be carried out. This may be used to identify whether adherence to hospital guidelines improves after active promotion of correct insulin prescribing practices.

Acknowledgement: I would like to acknowledge and thank the Diabetic Specialist Nurses at Northern Devon District Hospital for their help and support with this audit.

References
3 ‘High alert’ medications and patient safety. International Journal for Quality in Health Care 2001; Volume 13, Number 4, p339-340
4 Death following wrong insulin dose. BBC news online. Published: 08/12/2005 15:53:34 GMT http://news.bbc.co.uk/1/hi/nhs/4509786.stm (Last accessed on 08/01/08)
5 Committee on Safety of Medicines, medication error: potential for confusing Humalog and Humalog Mix 25. Current problems in pharmacovigilance May 2005; Volume 26, p4
6 Summary of Product Characteristics of Humalog and Humalog Mix 25 http://emc.medicines.org.uk (Last accessed on 09/01/08)
7 North Devon Hospital Medicines Policy
8 North Devon Hospital Formulary 2008

An audit into the documentation of in-patient allergy status across the Heart of England NHS Foundation Trust
Spilsbury E
Department of Pharmacy, Birmingham Heartlands Hospital, Birmingham

Introduction
The clear documentation of patient allergies in clinical practice is essential in ensuring patient safety and promoting safe practice amongst healthcare professionals. Hospitalised patients are at an increased risk of adverse drug reactions due to the number of diagnostic and therapeutic procedures they undergo. A Spoonful of Sugar, produced by the National Audit Commission in 2001, documented 1100 deaths that were directly linked to drug errors at an overall cost of £500 million per year to the National Health Service.

In January 2008, the Heart of England NHS Foundation Trust (HEFT) updated its Medicines Policy (MP). The MP now states that the completion of allergy status, on the inpatient prescription form, is mandatory and essential for any administration or dispensing of drugs prescribed for a particular patient to take place. The policy has been in operation since 2nd January 2008.

Objective
To determine the percentage of inpatient allergy box completion across the HEFT.

Method
The audit was carried out over a 13 week period between 17.12.08 – 14.03.08. Pharmacists were asked to fill out an audit form detailing the recording of patient allergy status on their wards 1 week prior to the MP change, 1 week after the policy change and then 11 weeks after the policy change. At the 11 weeks post policy change audit pharmacists were also asked to determine whether they had completed the allergy information on the patient's chart or whether it had been determined by a doctor. Pharmacists from all three Trust sites completed this exercise: Birmingham Heartlands Hospital (BHH), Good Hope Hospital (GHH) and Solihull Hospital (SH). Results were then collated and analysed using Microsoft Excel after each point of data collection.

Results
During the pre policy change audit 460 drug charts were seen across 20 wards at BHH and 78% (360/460) of allergy boxes were completed with allergy information. At GHH, 403 charts were seen across 18 wards and 59% (238/403) were completed. At SH, 216 charts were seen across 13 wards with 78% (169/216) showing allergy information. The grand total Trust average across all three sites for allergy documentation prior to the MP change was 71% (767/1079).

During the one week post MP implementation audit, 590 drug charts were seen across 28 wards at BHH with 86% (505/590) having completed allergy sections. More charts were seen during this stage of the audit, compared to the previous, due to the extraction of data from wards with electronic prescribing systems. All of the wards that have electronic prescribing demonstrated a 100% allergy status completion rate. These wards were not included in the one week pre policy change audit due to time constraints. At GHH, 401 charts were seen across 19 wards with 84% (336/401) of allergy boxes showing allergy information. At SH, 209 charts were seen across 13 wards with 93% (196/209) of allergy boxes being complete. The grand total Trust average for allergy documentation at this stage of the audit was 86% (1037/1200).

During the eleven week post MP implementation audit, 552 drug charts were seen across 25 wards at BHH with 97% (536/552) having completed allergy sections. 13% (69/536) of the filled allergy boxes had been completed by a pharmacist. At GHH, 317 charts were seen across 15 wards with 96% (305/317) of allergy boxes showing allergy information. Pharmacists completed 5% (15/305) of the allergy boxes. At SH, 211 charts were seen across 13 wards with 97.2% (204/211) of allergy boxes being complete. 18% (36/204) of the completed allergy boxes had been filled by pharmacists. The overall Trust average for allergy documentation was 97% (1045/1080).

Table 1 summarises the results gained over the 11 week audit period.

Discussion
This audit showed a significant improvement in the percentage of allergy boxes completed after the implementation of the new MP at the HEFT in January 2008. The grand total trust average for the percentage of allergy boxes filled increased from 71% to 97% over the 13 week period of the audit. This figure is promising but not totally compliant with the
Introduction

Bart's and The London NHS Trust, London

It is estimated that around 90,000 people are living with HIV in the United Kingdom. Around 1,700 patients receive their HIV treatment at the Andrews unit at St. Bartholomew's hospital. The unit is one of the busiest HIV units in the UK serving the diverse population of east London and Essex.

Patients attend clinic appointment at intervals appropriate to the state of their treatment. Patient's prescriptions are dispensed at Andrews Pharmacy – a pharmacy specialised in the supply of HIV medication. Delivery of the patient's medication to their home is a popular alternative for patients who do not wish or who are unable to wait for long periods. Currently 483 patients receive home delivery.2 The right is reserved for those patients who are stable on their drug regime and must be suggested by their clinician. The prescription is screened by the Andrews pharmacists, dispensed by Lloyd's pharmacy and delivered by Movianto healthcare logistics.

The National Health Service has a duty of care towards all people to whom it provides a service and any independent contractor that the NHS outsources its services to should be able to uphold the NHS service values. This audit was therefore considered necessary to ensure that essential standards of the service are being achieved. The results of the audit may highlight areas in which the provision of the service is lacking and recommendations may be made to amend these.

Audit standard which was set at 100% completion. A doctor should refer to a patient's allergy status before prescribing each and every drug. When a new patient is 'clerked' in an allergy status should always be ascertained. The data obtained indicates that in some cases prescriptions were written for patients with no allergy status present on the treatment chart. This is strongly indicative of prescribing without reference to allergy status. The prescriber may have looked in the admission notes or have made a mental note of it, but having it on the treatment chart in the appropriate place aids efficient, effective and safe prescribing.

The wards at BHH with the electronic prescribing system in place had consistent 100% allergy status records. This is due to the fact that a patient's allergy status must be completed for any prescribing to be permitted by means of an automatic alert that appears on the screen for the attention of the prescribing doctor.

The findings of this audit are somewhat limited by the lack of a complete set of data received from BHH in the 1st stage and for GHH at the 3rd stage of the audit, due to the limited time allocated for data collection. However, the wards for which an incomplete data set was obtained showed a good percentage of allergy recordings at subsequent stages of the audit.

Table 1: Summary of results over the 11 week audit period

<table>
<thead>
<tr>
<th>Audit stage</th>
<th>Average % completion of allergy status at HEFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week pre MP change</td>
<td>71</td>
</tr>
<tr>
<td>1 week post MP change</td>
<td>86</td>
</tr>
<tr>
<td>11 weeks post MP change</td>
<td>97</td>
</tr>
</tbody>
</table>

Objectives

To assess the patient satisfaction and essential parameters of service provision. The specific standards being set are:

- 95% of patients that have received home delivery describe themselves as satisfied or very satisfied with the service.
- 0% of patients report a breach in confidentiality.
- 0% of patients have received the wrong medication
- 0% of patients have been forced to phone for an emergency supply due to a fault in the delivery service.

Methods

The questionnaire was designed to analyse the patient satisfaction of the home delivery service with respect to the objectives stated in the previous section.

The pilot study was conducted for 7 working days. The results from the pilot study were analysed and the questionnaire re-drafted. The main audit proceeded for a further 37 days. The questionnaires were separated into those from patients (a) currently receiving home delivery, (b) those that had received home delivery in the past and (c) those that had never received home delivery. The answers from the pilot questionnaire still related to the primary objectives and so were included in the results. They were analysed in the same way as those from the main audit.

The questionnaires from patients receiving home delivery past and present were collated and the answers from the questionnaires pooled. This allowed analysis of the questionnaires with relation to the primary objectives and produced statistics to show whether the objectives had been met.

Results

The results of the study that relate to the objectives stated are summarised in the Table 1.

Discussion

In total, exactly 100 questionnaires were returned (15 pilot, 85 audit). This gives a mere snapshot of the total population receiving medication from the pharmacy.

The home delivery service did not achieve any of the four objectives set. The objectives were however very rigid and taking into account the timeframe within which the patients received home delivery, the results may have been different.

There is certainly a need to perform a re-audit. This audit did raise a number of considerations that would need to be taken into account upon re-audit:

- How long ago did the patient receive home delivery
- Redesign of the questionnaire so that interpretation of primary outcomes are less clouded by variations in patient perception
- Consideration of the way the patient population will be sampled to provide a more representative sample

<table>
<thead>
<tr>
<th>Questionnaires completed</th>
<th>Receiving home delivery</th>
<th>Patients 'satisfied' or 'very satisfied' with service</th>
<th>Confidentiality maintained on delivery 'disagree' or 'strongly disagree'</th>
<th>Received incorrect medication</th>
<th>Phoned for emergency supply</th>
<th>Phoned for emergency supply through fault attributable to home delivery company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients 'satisfied' or 'very satisfied' with service</td>
<td>53 (96%)</td>
<td>2 (25%)</td>
<td>n/a</td>
<td>5 (8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidentiality maintained on delivery 'disagree' or 'strongly disagree'</td>
<td>4</td>
<td>1</td>
<td>n/a</td>
<td>2 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received incorrect medication</td>
<td>1</td>
<td>1</td>
<td>n/a</td>
<td>11 (18%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phoned for emergency supply</td>
<td>11</td>
<td>n/a</td>
<td>11 (18%)</td>
<td>1 (1.6%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References


Patient satisfaction of anti-retroviral home delivery service

White T

Introduction

Table 1: Summary of results relating to objectives
Longer data collection period required, preferably 3–4 months in order to gauge the opinions of the majority of patients receiving the service.

Based on this audit, no current recommendations can be made. For the reasons to re-audit mentioned above, I feel that there is too much more that needs to be considered for a more reliable assessment of the home delivery service to be made.

References
1 AVerT. United Kingdom statistics summary. http://www.avert.org/uksummary.htm. Last updated 07/03/08, accessed 10/03/08

Missed doses on the acute medical unit at the Royal Liverpool and Broadgreen University Hospital NHS Trust

Cox KJ
Royal Liverpool and Broadgreen Hospital NHS Trust (Supervisor: Bassey J; Royal Liverpool and Broadgreen Hospital NHS Trust)

Introduction
The Acute Medical Unit (AMU) is the port of entry to the hospital for all medical admissions at the Royal Liverpool and Broadgreen University Hospital NHS Trust. It is situated on the ground floor of the hospital next to the Accident and Emergency Department, the Heart Emergency Centre and several other departments, including Observations. It has a high turnover of patients and also a high pharmacy presence. The Pharmacy Department is open 7 days a week (08:45-17:00) and an on-call pharmacist is always available out-of-hours.

Publications such the Department of Health’s ‘Building a safer NHS’ and the ‘Spoonful of Sugar Report’ have highlighted that medication errors lead to patient harm. One study has shown that of all hospital deaths due to medication, approximately one fifth were due to medication errors. This study classified omission as a type of medication error.

Objectives
To identify:
- the number of doses prescribed in the AMU
- the total number of missed doses
- the type of medicines missed
- the availability of medicines which were missed

Method
Medicine charts on the AMU were examined daily over a period of two weeks. Missed doses were identified by a ‘9’ (code for medicine not available) or a blank (where no code had been used to explain the reason for the missed dose). Other reasons for missed doses were excluded from the study (eg patient refusal, patient away from bed). Medicine name, strength, form and number of doses due were recorded for the medicines identified as being missed. Ward stock lists, available on the intranet, were used to identify medicine availability.

Results
During the audit, 270 drug charts were seen in total. Of these, 110 (40.7%) had at least one dose of one prescribed medicine omitted and 48 (17.8%) had doses missed from more than one prescribed medicine. Table 1 shows the number and percentages of medicines and doses missed and the availability of doses elsewhere in the hospital.

One hundred and sixty six (79.0%) of the missed medicines were available somewhere in the hospital out-of-hours. The remaining 44 (21%) medicines were not available directly to ward staff. One hundred and twenty three (58.6%) medicines were missed for 24 hours or more and 87 (41.4%) were missed for less than 24 hours.

The impact on patients of these missed medicines was then broadly assessed and split into 3 categories which were validated by two of the AMU consultants. These categories were:
- Major, where omission of the medicine had the potential to cause the patient harm. Examples of medicines included were antiepileptics such as carbamazepine and antibiotics such as ceftriaxone;
- Moderate, where omission of the medicine could have made the treatment sub-optimal, but was less likely to have caused the patient harm. Examples of medicines included were anti-hypertensives such as co-amolofruse;
- Minor, where omission of the medicine would have been unlikely to have caused the patient harm. Examples included supplements such as Adcal D3.

Of the 123 medicines missed for more than 24 hours, 13 (10.6%) medicines were categorised as major, 82 (66.7%) medicines were categorised as moderate and 28 (22.8%) were categorised as minor. Of the 87 medicines which were missed for less than 24 hours, 10 (11.5%) were categorised as major.

Discussion
This study has shown that two fifths of patients missed doses while on the AMU. It has also shown that for one fifth of patients, doses were missed from more than one of their prescribed medicines. The study has shown that over half of the medicines missed were for a duration of greater than 24 hours. This is surprising as the pharmacy is open every day of the week (although with a reduced service at the weekends) and, in addition, nearly 80% of the missed medicines were available to ward staff somewhere in the hospital out-of-hours without the involvement of the Pharmacy Department. As defined in this study, missed medicines have the potential to cause patients harm. Just over 10% of missed medicines were categorised as being major – where harm could have been caused to the patient.

The importance of administering medicines as prescribed and the potential consequences of not doing so, should be emphasised to ward staff. Anecdotal evidence suggested that ward staff did not know where to look for missing medicines or necessarily have the time to do so. In response to this, a protocol was developed to act as a reference source at the point of administration.

Once this protocol has been introduced, a re-audit is necessary to see if there has been an improvement in the situation.

References
3 NHS Litigation Authority Review 2003:27-6-9
A prospective audit assessing the management of bacteriuria in patients with catheters at Wrexham Maelor Hospital (WMH)

Palaniappan P and Laurence E
North East Wales NHS Trust (NEWT), Wrexham

Introduction
Urinary tract infection (UTI) is the most common hospital-acquired infection in the UK, accounting for 23% of all infections and the majority of these are associated with urinary catheters. In 2006, Clinical Knowledge Summaries (CKS) published guidance on the management of bacterial UTIs which sets the standards for antibiotic prescribing in patients with catheters. This guidance takes account of Scottish Intercollegiate Guidelines Network (SIGN) guideline no. 88 and advises that antibiotics should only be used when there is evidence that eradicating bacterial infection in the urine will result in meaningful health gains.

Both CKS and SIGN guidelines aim to minimise unnecessary use of laboratory tests and antibiotic treatment by the use of simple decision rules. They therefore recommend that:

- diagnosis of catheter-associated UTI should be based on patients’ clinical symptoms, not due to bacteriuria alone.
- catheter-specimens of urine (CSUs) should be cultured only in those who are symptomatic.
- where UTI is diagnosed, the antibiotic prescribed should be one to which the organism identified in the urine culture is sensitive.
- patients diagnosed with UTI should have their catheters removed or changed in conjunction with the initiation of antibiotic treatment.

Prior to and during this audit, there was no local policy in place at WMH for the management of bacteriuria in catheterised patients. Therefore this audit was conducted to evaluate the baseline practice in the management of bacteriuria in catheterised patients at WMH, against the recommendations made by CKS, prior to the publishing of new Trust guidelines.

Objectives
The aim of this audit was to establish the percentage of catheterised patients with bacteriuria at WMH medical and surgical wards who:

- had their urine samples sent for culture because symptomatic UTI was suspected.
- were diagnosed with UTI based on their clinical symptoms, not due to bacteriuria alone.
- were prescribed appropriate antibiotics for symptomatic UTI.
- had their indwelling catheters removed or changed in conjunction with the initiation of antibiotic treatment for symptomatic UTI.

Method
The NEWT Pathology Computer System was used to identify all adult inpatients in the medical and surgical wards with positive bacteriuria. Catheterised patients who met the inclusion criteria were investigated for the symptoms of UTI. They were monitored over the next 24 hours to establish if they had been prescribed with the appropriate antibiotics and had their catheters removed or changed. The data was collected over a five-week period and a newly designed data collection form was employed to record the daily findings. In most cases, medical notes were reviewed in order to gather the data. However, when there was insufficient documentation, clinicians or nursing staff were approached for further clarification.

Results
Over the five-week period:

- 47 catheterised patients’ CSU samples were sent for culture; 68% of these CSUs belonged to symptomatic patients, and 81% of these CSU samples were correctly labelled as catheter-specimens of urine.
- 23 bacteriuric patients were diagnosed with UTI; 87% of these patients were diagnosed based on their clinical symptoms, not due to bacteriuria alone.
- 20 symptomatic patients were treated for UTI; 75% of these patients were prescribed with appropriate antibiotics to which the infection-causing organisms were sensitive.
- 20 symptomatic patients were prescribed with antibiotics; only 25% of these patients had their catheters removed or changed in conjunction with the initiation of antibiotic treatment.

Discussion
The findings of this baseline audit clearly demonstrate that a significant proportion of bacteriuria in catheterised patients in medical and surgical wards at WMH was not managed appropriately and failed to comply with the recommendations made by CKS guidance. This poor compliance resulted in improper prescribing of antibiotics and unnecessarily increased the cost to the NHS. Moreover, failure to remove or change catheters in conjunction with antibiotic therapy prolongs the infection and these patients are more likely to have recurrence of acute symptoms within one month of treatment.

Therefore, this audit emphasises that clinicians and ward staff should be encouraged to adhere to the CKS guidelines. The implications of this audit were disseminated to the Consultant Microbiologists, Consultant Urologists, Infection Control Lead Nurses and Pathology Laboratory Manager at NEWT with a few suggestion on how the utilisation of clinical resources could be improved and overdue of antibiotics could be prevented.

References

Audit on adherence to the trust antibiotic prescribing policy

Rudd S
Derby Hospitals NHS Foundation Trust, Derby

Introduction
It has been shown that the length of antibiotic course affects the incidence of hospital acquired infection. Therefore, the local Antibiotic Prescribing Policy states the correct way in which antibiotic prescriptions should be written, which includes stop and review dates, and aims to reduce inappropriate long course lengths. There is also evidence to show that monitoring of antibiotic usage, for example by a hospital pharmacy team, can result in significant antibiotic cost-savings. The local policy therefore
also states that antibiotic prescriptions on a drug chart must state the indication, written in the ‘special directions box’, to make monitoring easier. As well as instructions for prescribers, the policy includes instructions for pharmacists, stating they should endorse the chart appropriately to increase awareness of the review/stop date.

**Objectives**

This audit aims to assess adherence to the antibiotic prescribing policy. There are three standards that are being assessed:

1. 100% of prescriptions on charts should have an indication;
2. 100% of prescriptions on charts should have a stop/review date;
3. 100% of antibiotic prescriptions with review/stop dates should have the administration boxes altered.

**Method**

Data from 232 antibiotic prescriptions were collected using an audit pro-forma.

**Results**

Standard 1: 6% of prescriptions had an indication written on the chart (Figure 1).

Standard 2: 19% of prescriptions had a review/stop date written on the chart (Figure 1).

Standard 3: 79% of prescriptions with a review/stop date had the administration boxes altered (Table 2).

**Discussion**

Overall adherence to standards 1 and 2 are low. This could be because awareness of the existence of this policy is quite low – it cannot be found on the trust intranet, and paper copies seem to be few in existence. Also, there are a few acceptable reasons as to why a review or stop date is not written on chart; the patient may be on long term prophylaxis or treatment, the patients treatment may be reviewed on a daily basis as a matter of course, for example in high dependency and intensive care beds. However, these reasons do not exempt the prescriber from writing an indication.

The results for standard 3 are fairly high, however there is still room for improvement. The shortfall could be because at the time that the chart was audited, it may not have been seen by pharmacy yet.

If this audit is repeated again, then it should be done in such a way as to ensure that all wards and areas are audited. Other useful information that could be collected is the length of time between the start date and the stop/review date to ensure that the policy is being followed. A more thorough look at the policy could assess whether requests for stop/review dates and indications were being written in the notes.

**Recommendations**

1. **Increase awareness of policy** It does not appear to be widely known that the policy exists. This could be rectified by providing training on prescribing antibiotics according to the policy, or circulating emails which outline the main points and the objectives of the policy. The internal prescribing bulletin could be utilised to circulate reminders to prescribers, and reminder emails sent to the pharmacy team to increase pharmacy awareness of the policy and their action points.

2. **Increase accessibility of policy** Most guidelines and policies are on the internal intranet. This would be an easy way to increase adherence to the policy. The policy should also be uploaded onto the pharmacy internal network, which will further increase accessibility.

3. **Review policy** To ensure adherence to the policy, any appropriate exceptions should be specified. Also there are some inconsistencies with the wording of the policy.

**References**


---

**Figure 1: The percentage of prescriptions that had a review/stop date and indication, broken down by directorate**

*Key: C + Rehab = Cancer and Rehabilitation, A+ D = Assessment and Diagnostics, W+ C = Women and Childrens*

**Table 1: The percentage of prescriptions that had administration boxes altered to show review and stop dates**

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of antibiotics</td>
<td>94</td>
</tr>
<tr>
<td>Number with stop review date</td>
<td>28</td>
</tr>
<tr>
<td>Pharmacist altered boxes</td>
<td>22</td>
</tr>
<tr>
<td>% boxes altered out of those with a review or stop date</td>
<td>79</td>
</tr>
</tbody>
</table>

---

**L An audit of drug history taking by a member of pharmacy staff at Kettering General Hospital (KGH)**

**Patel N**

Pharmacy Department, Kettering General Hospital NHS Trust, Kettering

**Introduction and aims**

A drug history, also known as a medication history, can be defined as the medicines a patient was prescribed and/or taking immediately before their hospital admission. An inaccurate or incomplete medication history can lead to an increase in drug interactions and adverse events, therefore reducing the quality of care received by the patient and increasing the length of hospital stay. The aim is to audit pharmacy practice in drug history taking against the relevant standard for pharmaceutical care at Kettering General Hospital (KGH). The audit will deduce how current practice compares to the agreed trust standard and suggest guidance on improving the quality of drug history taking. The practitioner’s compliance to the relevant drug history taking procedure will be audited, not the accuracy of the drug history itself.

**Criteria and standards to be audited against**

- 25% of patients, seen by a member of pharmacy staff, to have a drug history documented on page 1 (of the drug chart), within 48 hours of admission.
- 100% of drug histories to be obtained in accordance with the “TAKING A DRUG HISTORY” document, Pharmacy Directorate – Procedure PR/C/27.1.

**Method**

Firstly, a pilot study was designed and carried out before the final data were collected over a one-day period by the auditor alone. The data were collected without informing the drug history takers involved to ensure
the results obtained were a true reflection of drug history taking practice. All in-patients at KGH between 8.30am and 5.00pm on the day of data collection were deemed eligible for this study, with the exception of paediatric patients and patients on isolation wards. A total of 104 patients were recruited for the purposes of the study ensuring theirs and the practitioner’s anonymity.

Results

79% of drug histories taken by members of pharmacy staff were done so within 48 hours of the patient’s admission. However, only 18% of them were taken in accordance with the criteria. It was found on average that Medicines Management Technicians (MMTs), pharmacists and other members of hospital staff made 0.87, 1.35 and 2.89 deviations from the procedure, respectively, per documented drug history.

Conclusion

The clinical standard was met in terms of 25% of patients had their history taken within 48 hours of admission, but significantly less than 100% (as stated in the criteria) of them were taken in accordance with the procedure. Recommendations made include the reviewing of policies in light of the National Institute for Health and Clinical Excellence (NICE) guidance, the introduction of a medicines reconciliation form, informing those involved about the results obtained, giving patient interview training, and carrying out a re-audit.

References


Pfizer Preregistration Poster Overall Winner 2008

M

Healthy Heart Week

Philbin, J
Rowlands Pharmacy, Aberdeen

Aim

Modifiable risk factors for coronary heart disease (CHD) include smoking, diet, physical activity, alcohol consumption, and obesity. Statistics from the OECD (Organization for Economic Co-operation and Development) show that over 25% of adults in Scotland are obese. The aim of this project was to promote a healthy lifestyle to all customers over 18 years of age and encourage regular medical check-ups where appropriate.

Method

During the first week in October 2007, a one-week “Healthy Heart” campaign was conducted in a city-centre pharmacy in Aberdeen. A 15-item, customer questionnaire was developed, focusing on heart disease and lifestyle. Pharmacy staff were trained to conduct the questionnaire with customers using a standard operating procedure. A method of recording non-participation was also developed. Participating customers received written information (from NHS Grampian Health Promotions) and verbal lifestyle advice. A list of NHS patient-based web resources on risk factors for coronary heart disease was also made available to customers. Local general practices were informed about the campaign by letter. A poster advertising the campaign was displayed in pharmacy branch and in local surgeries.

The objectives of this study were to:

- Signpost individuals to appropriate services within Grampian.

The criteria outlined in SIGN 97 “Risk estimation and the prevention of cardiovascular disease” were utilised when deciding on the factors that would warrant a referral to a GP practice. Customers would only be encouraged to visit their surgery if they were >40 years, had multiple lifestyle risk factors and had not seen a GP for over 12 months.

Results

In total, 99 customers participated. Of these, 20 (~20%) reported established heart disease, and 41% had familial heart disease. Whilst all participants with established disease reported having a healthy diet, 65% and 25% consumed only 1-3 portions and 4-5 portions of fruit/vegetables daily, respectively. Approximately 2% reported consuming six or more portions of fruit and vegetables a day. Twenty eight participants had a normal BMI: 30 were overweight; 38 were obese; and four were morbidly obese. Thirty-six participants were smokers, of whom, 22 smoked between 10-20 cigarettes/day, eight smoked <10/day and six smoked >20/day. Most participants (n=79) drank alcohol, 15 of whom drank more than the weekly recommended allowance. Forty-eight participants reported taking regular physical activity less than twice a week.

Discussion

A wide range of lifestyle factors were recorded, along with participant personal and family history of heart disease. There have been many published studies and some systematic reviews carried out on the effects of lifestyle on morbidity and mortality.

Missing data was a limitation of this study. The record of non-participants was incomplete and inaccurate due to non-completion by staff during busy periods. Facilities were established in the consultation room to weigh, measure the height and waist circumference to customers for whom any of these factors were unknown. Approximately 30 customers omitted their waist circumference measurement. This may be partly attributed to staff being unable to attend each customer during busier periods.

Many customers reported modifiable risk factors for CHD. Community pharmacy is ideally placed to help address these factors. Smoking cessation advice and treatment is already an established community pharmacy service within Grampian. Additional services which should be considered are brief interventions (e.g. motivational interviewing) for alcohol consumption and healthy weight management. Obesity, in particular, has a major impact on physical, social and emotional well being. Bandleier reported “Better health through better lifestyle” combining all the different aspects of healthy living, makes a substantial difference to health outcomes by reducing the chance of heart attack or stroke by about 80% over fourteen years. A pharmacy-based healthy weight management service might be developed using the results of this study.

References

2. British Heart Foundation http://www.heartstats.org/datapage.asp?id=6799
Administration of Medicines, occurred in response to increasing emphasis on Clinical Governance by the Department of Health in a bid to reduce the incidence of errors involving prescription drug1. Prescription writing is recognised as a high-risk procedure and this combined with its frequent occurrence makes its surveillance important within the Trust, and therefore ensuring written prescriptions are safe, unambiguous and appropriate for the patient. TPP109 formed the standard criteria for the audit, which should be adhered to 100% in all written prescriptions in the Trust.

Objectives
This audit was undertaken to assess the Trusts compliance to prescription writing procedures and to identify problematic areas that could have the potential to cause medication errors within the prescription writing process.

Method
A cross section of seven medical and three surgical wards from the Trust were audited throughout February 2008. Data were collected from the first six prescription charts on each ward using two data collection spreadsheets; one was used for patient details and the other for the prescribed items. The design of the spreadsheets was based on the 15 main criteria of prescription writing guidance as set out in chapter 1, TPP109 and are shown in table 1. Scoring systems were used to assess parameters such as prescription legibility and allergy recording. Pharmacy endorses were ignored and prescriptions for MRSA prophylaxis and feeds were also excluded from data collection.

Results
The audit captured 60 prescription charts with a total of 456 items. These were assessed against the audit standard of 100% compliance with TPP109 the results of which are expressed in table 1. Only 5% of patient’s details were recorded fully and to the standards set out in TPP109. However there were three criteria that met the audit standard of 100%, those being the use of indelible ink and the patient’s name and hospital number being recorded.

Drug allergies scored the poorest compliance in patient detail recording (13%). As the trust requires six pieces of information to be entered into an allergy table on the front of the drug chart (only four pieces if the patient has no known drug allergies), Of the 60 charts a total of 75% had some sort of entry recorded of which only 13% were fully comprehensive i.e. 6/6 (4/4) pieces of information documented.

Prescribed items complied with the standards to 69% with the major failings occurring in legibility (80%) and use of generic name (90%) the most frequently used brand name was Fragmin, the Trusts low molecular weight heparin of choice.

Discussion
In many ways the Trusts drug chart is not only a prescription-writing tool, but it also assists in providing concise communication between medical/surgical teams and other healthcare professionals. Hence, incorrectly completed charts break this line of communication and expose both the patient and prescriber to unnecessary error.

Failure of the 60 charts monitored in this audit to meet the demands of the audit standards my suggest that prescribing staff neither are aware of the guidance set out in TPP109 for prescription writing or appreciate its importance. It may also be a consequence of prescribing beliefs amongst staff and highly pressurised working environments as also found in a study conducted in a London hospital.

As well as assessing prescription writing, this audit set out to identify problematic areas that could give rise to error. Some causes of medication error have been identified as illegible handwriting, failure to document drug allergies and prescribing by brand name2, all of which are criteria included in TPP109 with the intention of reducing error in the Trust. However it is precisely these standards that the Trusts prescribers are failing to comply with in Heatherwood and Wexham Park hospitals. Action is therefore required to bring current practice in line with TPP109 and supports the movement towards default electronic prescribing and greater support for prescribing staff.

ACKNOWLEDGEMENT Audit supervisor, Sakeh Hussain, for assistance and guidance throughout the audit process.

References

Audit of the treatment of community acquired pneumonia

David J. Chartres and Kirsteen Hill
NineWells Hospital & Medical School

Introduction
Community acquired pneumonia (CAP) is an acute illness with features of a lower respiratory tract infection. The morbidity, mortality and expenditure associated with CAP is substantial particularly when patient hospitalisation is essential. The typical cost per episode of CAP requiring secondary care intervention varies from £1700 – 5100. The British Thoracic Society (BTS) recommends the use of CURB65 as a validated tool for the assessment of disease severity. This tool identifies the adverse prognostic features of this acute illness and facilitates identification of appropriate antibiotic(s).

Streptococcus pneumoniae is the most likely implicated micro-organism and thus the main stay of treatment includes penicillin based antibiotics.

Aim of study
To assess compliance with the antibiotic care bundle and pathway for CAP in NineWells Hospital with the goal of improving patient care.

Materials and methods
A data abstraction tool was developed to collate the necessary information from the patient’s medical notes and drug kardex. This tool was piloted and subsequently amended. The data abstraction form recorded information relating to CURB65 score, drug allergy status and antibiotic selection, route of administration, dosage and duration. The standards utilised were evidence based derived from both the BTS guidelines and the CAP care pathway. Ethical approval was not required however, caldicott consent was granted from the medical director.

Results
Over a 5 week period, 20 patients (9 male: 11 female) aged between 31-90 years were included in the audit. CURB65 categories 1, 2 and 3 had 5, 9 and 6 patients respectively. 100% of patients had their CURB65 score documented and drug allergy status completed on their drug
kardex. The 6 patients identified as having a severe form of pneumonia received 100% adherence to the CAP care pathway with respect to initial route of administration, antibiotic selection and dosage regimen. This patient group were appropriately switched from their intravenous antibiotic(s) to the respective oral antibiotic(s). Twenty-five percent (5) of patients with a CURB65 score of ≤2 received the correct antibiotic as per the NHS Tayside care bundle and pathway. Nine patients received their antibiotic regimen for the correct duration.

Conclusions

Due to the low percentage adherence in some areas of the care pathway, there is a need for the multidisciplinary team to focus their attention on the antibiotic selection for those patients presenting with mild to moderate pneumonia to avoid a “just in case” approach to antibiotic selection. Antibiotic duration in all CURB65 categories was either too short or excessively long with few patients receiving the appropriate duration. Increased adherence to the care pathway will ensure patients are treated for the appropriate duration and help reduce antibiotic resistance and the adverse effects associated with anti-microbial usage.

References