

of the working group were communicated in the hospital's formulary committee meeting, an in-house journal published by the pharmacy and the intranet-based quality management system. The BfArM initiated steps to effect a change of the German SPC at the European level in November 2011.

Conclusions As a result of collaboration between a clinical pharmacist, the medicines information centre, the quality management system and external experts an in-house guideline was developed. At the European level the BfArM intends to bring about a change in the German SPC.

No conflict of interest.

GRP-096 IMPROVING SAFETY OF HIGH RISK MEDICATIONS IN A PSYCHIATRIC HOSPITAL

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Background Medicines are major causes of adverse events in hospitalised patients, which can be serious. However, not all drugs carry the same risks.

Purpose The purpose of the study was to identify a list of High Risk Medicines (HRMs) and increase their safety of use in a hospital (25 Care Units (CUs)) where an electronic drug process is in place.

Materials and Methods A multidisciplinary team was formed. Its task was to:

- conduct a literature review in order to identify HRMs
- perform an audit to assess drug processes in all CUs
- set up measures to improve the safety of HRMs

Results The literature review led us to establish an HRM list of 14 drugs (including oral/parenteral anticoagulants, anti-arrhythmics, insulins, parenteral hypertonic solutions, adrenergic agonists, opioids and digoxin).

Results of a clinical audit performed in 2011 revealed that 50% of the 391 referenced oral drug tablets are not fully identifiable until the administration stage; at least one error of storage in medicine cabinet was found in 32% of CUs; parenteral hypertonic KCl and MgSO₄ solutions were present in 76% and 28% of CUs respectively.

Measures taken to improve safety of HRMs were:

- ensure recognition with an alert pictogram for their storage in the pharmacy and CUs
- attribute an electronic HRM alert in prescription software
- re-label blister packs for non-unit packaging HRMs (relevant to 3/15 drugs on the list)
- rationalise keeping hypertonic solutions in CUs
- implement good clinical practise for HRMs and distribute a newsletter about HRM use
- develop a systematic statement of HRM errors
- provide information about relevant HRMs to patients
- arrange training for healthcare professionals

Conclusions Corrective actions should help to improve HRM safety by preventing medication errors. An evaluation of the efficacy of these measures in practise is needed. This work will allow us to meet the requirements of French legislation.

No conflict of interest.

GRP-097 IMPROVING THE QUALITY USE OF MEDICINES IN CHINA BY DEVELOPING THE ROLE OF THE CLINICAL HOSPITAL PHARMACIST: A SYSTEMATIC REVIEW

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Background China recently initiated ambitious healthcare reforms aiming to provide affordable and equitable basic health care to all by 2020. To meet these goals, new policies issued by China's Ministry of Health surrounding hospital accreditation and antimicrobial use highlighted the role of clinical pharmacy services. International studies highlight the benefits of such services; however to date they have excluded literature reported in Chinese.

Purpose To summarise all available evidence showing the effectiveness of clinical pharmacy services in improving the quality use of medicines in China's hospitals.

Materials and Methods For the English databases, Web of Science, Medline, IPA and Embase were searched using the following keywords: ('pharmacists' OR 'pharmacy' OR 'pharmaceutical services/care') AND ('China'). For the Chinese database, Chinese Biomedical Literature Database on disc was searched using the following keywords: ('clinical pharmacist/pharmacy' OR 'pharmaceutical services/care'). A native bilingual Chinese pharmacist processed relevant Chinese articles.

Results 75 published papers were included. The majority of studies were conducted in the inpatient setting (68%), which included clinical pharmacy interventions such as educating doctors and patients, evaluating and monitoring the implementation of hospital policies and reviewing medications on the ward. In the outpatient setting, the majority of studies conducted involved educating patients.

Clinical pharmacy services frequently focused on antimicrobials (44%). More than half of these studies employed an administrative intervention alongside the clinical pharmacy service. Clinical pharmacy research in China was also found to occur primarily in provincial capital cities (63%) and to use a comparative study design (61%).

Conclusions Clinical pharmacy services in China, with its unique healthcare system and cultural nuances, appear to positively influence patient care and the appropriate use of medicines. From the published literature, it is expected that clinical pharmacy services could make a strong contribution to China's healthcare reform given further governmental and educational support.

No conflict of interest.

GRP-098 INAPPROPRIATE PRESCRIBING FOR ELDERLY PEOPLE: IS THE HOSPITAL THE INITIATOR?

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Background Adverse drug reactions are frequently encountered in older people. They represent the cause of hospitalisation of 10 to 20% of hospitalised people aged 60 years or over. The quality of geriatric prescription is thus a healthcare priority.

Potentially inappropriate drugs (PIDs) are medicines with an unfavourable benefit/risk ratio or questionable efficacy while other and safer therapeutic alternatives are available.

Purpose To evaluate the quality of prescribing in our hospital for patients who are 75 years old or over. Are PIDs prescribed to our patients? Who first prescribed this treatment: our hospital doctors or family doctors?

Materials and Methods A list of potentially inappropriate medicines, judged by 34 criteria, specially adapted to French medical practise, was used as reference. 28 of these drugs are used in our hospital. We analysed the prescriptions of patients who were 75 years old or over, hospitalised on one day chosen arbitrarily, in order to collect data about their treatments.

Results 133 patients (29.6% of patients hospitalised in medical and surgical care units) were included. On average, 8 systemic drugs were prescribed per patient. 31 patients had at least 1 PID prescribed (23.3%): 24 (18%) had 1 PID, 5 (3.8%) had 2 PIDs and 2 (1.6%) had

3 or more PIDs. 70.9% were psychotropic drugs. 53.7% of them were initiated by doctors working in our hospital, 86.4% of which by a senior doctor versus 13.6% by a resident.

Conclusions This study shows that a significant proportion of PIDs are initiated in our hospital. To improve practise, pharmacists have to make doctors aware of PIDs and suggest therapeutic alternatives before treatment is started. If PIDs are prescribed, pharmacists should formulate pharmaceutical interventions.

We will add this criterion to our trigger tool which selects high-risk prescriptions.

No conflict of interest.

GRP-099 INCIDENCE OF DRUG INTERACTIONS IN A CARDIOLOGY DEPARTMENT

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Background Starting in 2007, the Pharmacy Institute at Bajcsy-Zsilinszky Hospital in Budapest was the first healthcare institution in Hungary to use centralised medicines Daily Dose System (DDS).

The number of medicines administered to a patient may increase the probability of drug interactions. If physicians prescribe treatment without due foresight this may cause subsequent problems for the patient.

Purpose Pharmacists are the last cheque-point in the medicines system. The study sought to justify the importance of this by monitoring interactions.

Materials and Methods The incidence of theoretical and clinically relevant interactions was followed on the cardiology department at Bajcsy-Zsilinszky Hospital in a four-week period cross-sectional study. During this period, the drug treatment and the potential interactions were examined by using NovoHosp.win software.

Results A total of 218 patients were registered in the study, gender distribution of the sample: 100 women (46%) and 118 men (54%). A total of 1,893 drugs were prescribed, an average of 9 drugs per patient. The NovoHosp.win software found 603 interactions, which was an average of 3 interactions per patient. 174 patients had at least one possible interaction, but clinically relevant problems (increased APTT and INR values, potassium level differences and uric acid changes) had only arisen in 25 patients, 8 women (32%) and 17 men (68%). The software indicated 4 theoretical and 1 clinically relevant interactions in this patient group. The relevant interactions were classified as follows: potassium level differences 19%, uric acid changes 22%, APTT abnormalities 37%, changes in INR 22%.

Conclusions In the present study, 25 patients had 30 relevant interactions, as a result of which medicines were changed on 22 occasions. Changes in the dose, dose adjustments or drug substitution abolished the interactions. The study also demonstrates the importance of cooperation between hospital/clinical pharmacists and physicians.

No conflict of interest.

GRP-100 INCIDENCE OF ERRORS IN DRUG DOSAGE ACCORDING TO KIDNEY FUNCTION-ESTIMATING EQUATIONS IN MEDICAL INPATIENTS

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Background Inpatients frequently require dose adjustments of medicines due to acute changes in renal function. The FDA recommend adjusting medicines according to the estimated glomerular

filtration obtained with the Cockcroft-Gault formula. However the Modification of Diet in Renal Disease (MDRD) study equation is widely recognised as more accurate than Cockcroft-Gault, which confuses clinicians because they do not know its utility for adjusting drug doses.

Purpose To compare the incidence in inpatients of medicine dosing errors depending on the type of equation used to estimate it: Cockcroft-Gault or MDRD.

Materials and Methods A cross-sectional study was conducted in a low complexity unit. Patients were included with impaired renal function who were not on haemodialysis.

We used the FDA guidelines to determine the incidence of errors.

Fisher's test was used to compare the groups, with statistical significance level <0.05.

Results We included 56 inpatients and 214 prescriptions. 58% were women and 68% were older than 65. We detected 42% and 28% of errors using CG and MDRD, respectively ($p = 0.014$). The most common error was an overdose (79%) followed by an underdose (12%) and contraindication (9%).

Further analysis found that the difference between the two equations occurred only in the following subgroups of patients: patients with mild to moderate impairment of renal function (38% versus 23%, $p = 0.03$), older than 65 years (51% versus 30%, $p = 0.01$) and low body weight (37% versus 31%, $p = 0.04$). The distribution of types of errors was similar in the three subgroups.

Conclusions The percentage of dosing error for both methods was similar to that reported in the literature.

The two equations were not discordant except in the elderly, in patients with low body weight and with mild renal dysfunction. This could explain why there were differences in the incidence of medicine errors in these subgroups.

In the absence of a gold standard to assess the acute deterioration of renal function and considering the limitations in estimating renal function with these equations, clinicians should include clinical judgement when determining the dose for each patient. The dose should be determined by weighing the risk of toxicity with higher doses versus the risk of treatment failure with lower doses, especially in elderly and low body weight patients.

No conflict of interest.

GRP-101 INSULIN: IMPROVING PRESCRIBING SAFETY

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Background Insulin has been defined as one of the highest risk medicines worldwide, [1] with a 2009 national UK audit demonstrating prescribing errors in 19.5% of in-patient insulin prescriptions. [2] The NPSA (National Patient Safety Agency) Rapid Response Report, issued in June 2010, further highlighted errors in the administration of insulin by clinical staff and called for immediate action to improve insulin prescribing. [2]

Purpose In 2010, an audit of insulin prescribing was conducted at North Bristol NHS Trust (NBT), using the Patient Safety First 'insulin prescription bundle' data collection tool that focused on five key safety-critical prescribing elements. [4] Following the results of the 2010 audit and NPSA alert, an insulin prescription chart was developed with the aim of significantly improving insulin prescribing.

Materials and Methods On 4th October 2012, the impact of the NBT insulin prescription chart was examined during a one-day cross-sectional audit (incorporating all specialities), using a special data collection form developed from the 'insulin prescription bundle'. [4] This incorporated five key audit standards:

- All prescriptions written by brand name with the word 'insulin' included
- The word 'Units' written in full