obtaining supplies, likely cost and the risk of confusion between propranolol base and hydrochloride when prescribing and dispensing. Preparations B and C are suitable for use in children over 1 month of age. Preparation C is recommended because it contains less propylene glycol and no alcohol. Preparation A should only be used in children under 28 days. Using Preparation C instead of Preparation A gives the benefits that a licensed preparation is used, dispensing delays are reduced and costs are reduced.

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A BASELINE REVIEW OF THE ACTIVITY OF THE PICU PHARMACISTS USING ELECTRONICALLY CAPTURED DATA

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Aim To date there are no metrics for the clinical pharmacist service to PICU. It is accepted that use of a Clinical Information Management System (CIMS) has a role in medication safety,¹ however there are few studies that review the information potential of a CIMS for collecting pharmacist activity.²

Method Additional fields and custom reports were configured in the CIMS to enable PICU pharmacists to record their activity in the following areas:

- Medicines reconciliation within 72 hours of admission to PICU
- Discharge kardex review
- Analgesia and sedation (A&S) review
- Clinical pharmacy review

Other interventions & medication error reporting continued as per normal practice. Data was analysed using Microsoft Excel®.

Results Complete data was available from July 2017 to end of 2018.

There were 1274 medicines reconciliations by a pharmacist within 72 hours of admission (78% admissions). 14% of discharge kardexes had been reviewed prior to discharge to the ward. There was an average of 190 pharmacy reviews per 100 bed days. A total of 780 Pharmacist A&S Plans were documented by the clinical pharmacists – an average of 2 per working day, and 48% of admissions.

Comparisons between each six month period showed a significant increase in the number of pharmacists medicines reconciliations ($p < 0.001$). No other differences were found.

Conclusion This study has shown that electronic tracking of pharmacist ward activity is possible. It has the potential to demonstrate compliance with external or internal standards

and audits. This data continues to be collected, and therefore these results will be used as a baseline to compare future activity. The findings of this study may encourage other units to replicate, providing data that can be used for comparison. Further configuration of the CIMS to capture other metrics such as TDM, and document discrepancies in medicines reconciliation is planned.

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A REVIEW OF THE USE OF INTRAVENOUS IMMUNOGLOBULIN (IVIG) IN PAEDIATRIC NEUROLOGY PATIENTS AT A CHILDREN'S HOSPITAL FROM APRIL 2017 TO APRIL 2019

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Aim To determine if the use of IVIG in neurology patients at a children's hospital was appropriate according to local¹ and national guidance^{2,3}.

Method All paediatric neurology patients supplied with IVIG from the hospital pharmacy from April 2017 to April 2019 were identified retrospectively using the pharmacy dispensing system. The standards were based on local and national guidelines from the Department of Health (DoH). Patients' details, for example indication and dose, were recorded and analysed on Microsoft Excel.

Standards

1. 100% of patients will have an IVIG request form completed.
2. 100% of patients will have IVIG prescribed for indications approved by the DoH.
3. 100% of patients will have panel approval before being supplied with IVIG.
4. 100% of patients will have the appropriate dose and duration of IVIG for the corresponding indication according to guidelines.

Results A total of 20 patients were identified for this audit with 4 patients from 2017/18 and 16 from 2018/19. Standard 1 was met by 100% of patients. 8 patients (40%) were given IVIG for indications that do not have automatic approval from the DoH guidelines, i.e. for indications under 'grey' or 'black' categories. 2 patients (10%) did not have panel approval and both of these patients had acute flaccid myelitis, which is a 'black' indication. 16 (80%) patients were prescribed IVIG at a dose or duration advised by local and DoH guidelines.

Conclusion and Discussion During the study period the method for completing the IVIG request forms changed to a new electronic system. The two patients with acute flaccid myelitis were incorrectly approved by the IVIG panel due to an error in the new electronic request form. The approval system was updated to prevent this error from reoccurring. All other patients that did not have automatic approval from the DoH guideline were approved by the local IVIG panel before use. Overall cost and usage increased significantly from

2017/18 to 2018/19; approximately £9,300 and £57,000 respectively. One patient was given a higher dose over a shorter period but the total dose for each course was the same. The shortened regimen meant that doses were rounded to the nearest vial size, which reduced wastage. The demand for IVIG is increasing and due to its limited availability and high cost, it is important that IVIG is only given to patients that meet the specified requirements.

Recommendations

- Ensure patients are only supplied with IVIG if the above standards are met
- Neurology pharmacist to re-audit data annually to ensure that IVIG is being given according to guidelines

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MAPPING THE PREVALENCE AND NATURE OF DRUG RELATED PROBLEMS AMONG HOSPITALISED CHILDREN IN THE UNITED KINGDOM: A SYSTEMATIC REVIEW

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Aims Problems with medication account for 10–20% of all adverse healthcare events in the NHS, costing between £200–400 million per year.¹ Children are more likely to experience medication related harm.² International reviews of the prevalence of drug-related problems are over ten years old.³ There is a need for a focussed and critical review of the prevalence and nature of drug-related problems in hospitalised children in the UK to support the development and targeting of interventions to improve medication safety.⁴

Methods Nine electronic databases (Medline, Embase, CINAHL, PsychInfo, IPA, Scopus, HMC, BNI, The Cochrane library and clinical trial databases) were searched from January 1999 to September 2018. Studies were included if they were based in the UK, reported on the frequency of adverse drug reactions (ADRs), adverse drug events (ADEs) or medication errors (MEs) affecting hospitalised children, and quality appraisal of the studies was conducted.

Results 26 studies were included; none of which specifically reported on the prevalence of ADEs. Three ADR studies reported a median prevalence of 28.3% of patients (IQR 13); >70% of reactions warranted withdrawal of medication. Sixteen studies reported on prescribing errors and the median prescribing error rate in all paediatric contexts was 10.7% of prescriptions (IQR 6) Seven studies explored prescribing errors in PICU and the prevalence was twice that in non-ICU areas (11.1% prescriptions; IQR 2.9 versus 6.5% prescriptions; IQR 4.3). The median rate of dose prescribing errors was 11.1% doses prescribed (IQR 10.6). Four studies reported administration errors of which three used consistent

methods. Across these three studies, a median prevalence of 12.4% of administrations (IQR 7.3) was found. Administration technique errors represented 53% of these errors (IQR 14.7). Errors detected during medicines reconciliation at hospital admission affected 43% of patients, 33% (IQR 13) of prescribed medication with 70.3% (IQR 14) classified as potentially harmful. Medication errors detected during reconciliation on discharge from hospital affected 33% of patients and 19.7% of medicines, with 22% considered potentially harmful. No studies examined the prevalence of monitoring or dispensing errors.

Conclusions Children are commonly affected by drug-related problems throughout their hospital journey. Given the high prevalence and risk of patient harm, there is an urgent need for outcome-focussed research on preventable ADEs in paediatric hospital settings in the UK. A deeper understanding of medication processes for children in hospital from a systems and theoretical perspective will also support the development and targeting of effective interventions to improve patient safety.

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IMMUNOSUPPRESSION IN THE FIRST SIX WEEKS FOLLOWING PAEDIATRIC CARDIAC TRANSPLANT

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Aim The aim of this audit was to establish whether immunosuppression was being prescribed correctly and whether target levels were being reached during the first six weeks post-transplant.^{1 2}

Method The standards were discussed and agreed, due to an absence of standardised local or national written protocols, with the lead paediatric cardiothoracic transplant consultant and a specialist transplant liaison nurse. The paediatric transplant database provided a list of patients between October 2016 and July 2018, from which paediatric cardiac transplant patients were included in this audit. All data were collected retrospectively, for the first six weeks post-transplant, from patient's electronic records.

Results Twenty-three patients were included in the audit; fifteen males and eight females and the mean age was 6 years old. The standards for the timing and dosing of the first ciclosporin dose were met for 87% and 78% of patients respectively. Six patients (26%) had a ciclosporin level within the target range by day 4 post-transplant, for the remaining seventeen patients the average was day 9 post-transplant. The mean levels remained within this range or slightly above after day 9. Azathioprine or mycophenolate was started within 7 days of transplant in 6 patients (23%). Four patients (17%) had documented episodes of rejection; in one patient all other standards were met and in the other three only one additional standard was not met. Nineteen patients (83%) did not have a documented episode of rejection.