Report of the announced inspection of medication safety at Children’s Health Ireland at Temple Street.

Date of announced inspection: 14 November 2019
About the Health Information and Quality Authority (HIQA)

The Health Information and Quality Authority (HIQA) is an independent statutory authority established to promote safety and quality in the provision of health and social care services for the benefit of the health and welfare of the public.

HIQA’s mandate to date extends across a wide range of public, private and voluntary sector services. Reporting to the Minister for Health and engaging with the Minister for Children and Youth Affairs, HIQA has responsibility for the following:

- **Setting standards for health and social care services** — Developing person-centred standards and guidance, based on evidence and international best practice, for health and social care services in Ireland.

- **Regulating social care services** — The Office of the Chief Inspector within HIQA is responsible for registering and inspecting residential services for older people and people with a disability, and children’s special care units.

- **Regulating health services** — Regulating medical exposure to ionising radiation.

- **Monitoring services** — Monitoring the safety and quality of health services and children’s social services, and investigating as necessary serious concerns about the health and welfare of people who use these services.

- **Health technology assessment** — Evaluating the clinical and cost-effectiveness of health programmes, policies, medicines, medical equipment, diagnostic and surgical techniques, health promotion and protection activities, and providing advice to enable the best use of resources and the best outcomes for people who use our health service.

- **Health information** — Advising on the efficient and secure collection and sharing of health information, setting standards, evaluating information resources and publishing information on the delivery and performance of Ireland’s health and social care services.

- **National Care Experience Programme** — Carrying out national service-user experience surveys across a range of health services, in conjunction with the Department of Health and the HSE.
# Table of Contents

1. Introduction................................................................................................................. 7
2. Findings at Children’s Health Ireland at Temple Street Hospital.......................... 10
   2.1 Leadership, governance and management ......................................................... 10
   2.2 Risk management................................................................................................. 11
   2.3 High-risk medications and situations ................................................................. 14
   2.4 Person centred care and support ........................................................................ 20
   2.5 Model of service and systems in place for medication safety ......................... 22
   2.6 Use of information............................................................................................... 23
   2.7 Monitoring and evaluation................................................................................... 24
   2.8 Education and training....................................................................................... 26
3. Summary and conclusion ........................................................................................... 28
4. References ................................................................................................................ 30
5. Appendices ................................................................................................................ 37
   Appendix 1: Lines of enquiry and associated National Standards for Safer Better
   Healthcare ................................................................................................................ 37
   Appendix 2: Hierarchy of effectiveness of risk-reduction strategies in medication
   safety ......................................................................................................................... 38
   Appendix 3: National Coordinating Council for Medication Error Reporting and
   Prevention. Index for categorising medication errors ........................................... 39
1. Introduction

HIQA’s medication safety monitoring programme began in 2016 and monitors public, acute hospitals in Ireland against the National Standards for Safer, Better Healthcare to ensure patient safety in relation to the use of medications. The programme aims to examine and positively influence the adoption and implementation of evidence-based practice in relation to medication safety in acute healthcare services in Ireland.

Medications are the most commonly used intervention in healthcare. They play an essential role in the treatment of illness, managing chronic conditions and maintaining health and wellbeing. As modern medicine continues to advance, increasing medication treatment options are available for patients with proven benefit for treating illness and preventing disease. This advancement has brought with it an increase in the risks, errors and adverse events associated with medication use.

Medication safety has been identified internationally as a key area for improvement in all healthcare settings. In March 2017, the World Health Organization (WHO) identified medication safety as the theme of the third Global Patient Safety Challenge. The WHO aims to reduce avoidable harm from medications by 50% over 5 years globally. To achieve this aim the WHO have identified three priority areas which are to:

- improve medication safety at transitions of care
- reduce the risk in high-risk situations
- reduce the level of inappropriate polypharmacy.*

Medication safety has also been identified by a number of organisations in Ireland as a key focus for improvement. Medication safety programmes have been introduced in many hospitals to try to minimise the likelihood of harm associated with the use of medications, and in doing so maximise the benefits for patients. These programmes aim to drive best practice in medication safety by working to encourage a culture of patient safety at a leadership level and through the introduction of systems that prevent and or mitigate the impact of medication-related risk.

HIQA’s medication safety monitoring programme 2019

HIQA published a national overview report of the medication safety monitoring programme ‘Medication safety monitoring programme in public acute hospitals- an overview of findings’ in January 2018 which presented the findings from thirty-

* Polypharmacy: the use of many medications, commonly five or more.
four public acute hospital inspections during phase one of the programme. This report identified areas of good practice in relation to medication safety and areas that required improvement, to ensure medication safety systems were effective in protecting patients. A number of recommendations were made focusing on improving medication safety at a local and national level. The recommendations are detailed in the report which is available on the HIQA website (www.hiqa.ie).

The final phase of HIQA’s medication safety monitoring programme has been updated and developed and the current approach is outlined in eight lines of enquiry†. The lines of enquiry are based on international best practice and research, and are aligned to the National Standards¹ (see Appendix 1). The monitoring programme will continue to assess the governance arrangements and systems in place to support medication safety. In addition, there will be an added focus on high-risk medications and high-risk situations.

High-risk medications are those that have a higher risk of causing significant injury or harm if they are misused or used in error.¹² High-risk medications may vary between hospitals and healthcare settings, depending on the type of medication used and patients treated. Errors with these medications are not necessarily more common than with other medications, but the consequences can be more devastating.¹³

High-risk situation is a term used by the World Health Organization³ to describe situations where there is an increased risk of error with medication use. These situations could include high risks associated with the people involved within the medication management process (such as patients or staff), the environment (such as higher risk units within a hospital or community) or the medication.

International literature recommends that hospitals identify high-risk medications and high-risk situations specific to their services and employ risk-reduction strategies‡ to reduce the risks associated with these medications (Appendix 2).¹⁴

System based risk-reduction strategies have a higher likelihood of success because they do not rely on individual attention and vigilance, and a small number of higher level strategies will be more likely to improve patient safety than a larger number of less effective strategies.¹⁴ Therefore, risks associated with the procurement, dispensing, storage, prescribing, and administration of high-risk medications need to be considered at each step of the medication management pathway.¹⁵

---

† Lines of enquiry are the key questions or prompts that inspectors use to help inform their inspection, assessment or investigation.

‡ Risk reduction strategies: a term used to describe different ways of dealing with risks. Strategies include risk avoidance, transfer, elimination, sharing and reducing to an acceptable level.
**Information about this inspection**

An announced medication safety inspection was carried out at Children’s Health Ireland at Temple Street by Authorised Persons from HIQA; Emma Cooke and Dolores Dempsey-Ryan. The inspection was carried out on 14 November 2019 between 09:00hrs and 17:50hrs.

Inspectors spoke with staff, reviewed documentation and observed systems in place for medication safety during visits to the following clinical areas:

- Wards; Gabriels, Michaels B, Top Flat Medical and Michael’s C
- Emergency Department.

Two group interviews were held in the hospital with the following staff:

- Group one: the chairperson of the Drugs and Therapeutics Committee, the chief pharmacist and the risk manager.
- Group two: the director of nursing, the site chief executive officer (CEO) and the clinical director.

HIQA would like to acknowledge the cooperation of staff that facilitated and contributed to this announced inspection.

**Information about the hospital**

Children’s Health Ireland at Temple Street is part of Children’s Health Ireland, a single statutory entity, established following the publication of the Children’s Health Bill 2018, to provide acute paediatric healthcare services. Children’s Health Ireland is responsible for services previously provided by the following Dublin-based children’s hospitals; Our Lady’s Children’s Hospital, Crumlin, Temple Street Children’s University Hospital, and the National Children’s Hospital at Tallaght University Hospital.

Major specialities provided at Children’s Health Ireland at Temple Street include neonatal and paediatric surgery, neurology, neurosurgery, nephrology, orthopaedics, ear nose and throat and plastic surgery.
2. Findings at Children’s Health Ireland at Temple Street Hospital

Section 2 of this report presents the general findings of this announced inspection. The inspection findings are outlined under each of the eight lines of enquiry and opportunities for improvement are highlighted at the end of each section.

2.1 Leadership, governance and management

Hospitals should have governance arrangements in place to support the development, implementation and maintenance of a hospital-wide medication safety system.\textsuperscript{15,16}

Children’s Health Ireland at Temple Street Drugs and Therapeutics Committee was responsible for oversight of medication safety within the hospital, with formalised governance arrangements and clear lines of accountability in place for medication safety. The Drugs and Therapeutics Committee was accountable to the site Quality and Safety Executive which met every six weeks and had oversight of medication safety incidents at the hospital. The chief pharmacist formally submitted bi-annual medication safety reports to the site Quality and Safety Executive Committee. Outside of these formal reporting arrangements, the chairperson of the Drugs and Therapeutics Committee brought any relevant medication issues to the attention of the site Quality and Safety Executive Committee, the clinical director or the site chief executive officer. Overall executive accountability and authority for medication safety within the hospital rested with the site chief executive officer.

Membership of the Drugs and Therapeutics Committee was multidisciplinary to reflect the fact that medicines management is the responsibility of a number of clinical professional groupings.\textsuperscript{16} Since the last inspection, the committee were successful in appointing a community pharmacist as a member which was a positive finding.

The hospital had established a medication safety committee in August 2019. The committee was also chaired by the chair of the Drugs and Therapeutics Committee and membership included; the risk manager, a clinical nurse manager, a senior pharmacist, a non-consultant hospital doctor (NCHD) representative and a nurse practice coordinator. Inspectors were informed that the committee was at the early stages of development and some of its key functions involved reviewing all medication safety incidents in greater detail and to support the development and implementation of a medication safety programme within the hospital.
Hospitals should have a clear corporate strategy that sets out the organisation’s mission, values, role, functions and actions to be taken to meet organisational goals.\textsuperscript{10,17} HIQA’s previous inspection in 2018 recommended the development of a formalised medication safety strategy in line with recommended practice.\textsuperscript{10,18} However, this was not in place on the day of inspection. In the absence of a formalised medication safety strategy, inspectors were informed that the hospital had focused on broadening incident reporting across all disciplines and improving medication safety training. It was explained that one of the priorities of the newly formed Medication Safety Committee would be to develop a comprehensive medication safety strategy by quarter one 2020 with annual objectives aligned to the hospital’s overall strategic medication safety goals. Progress related to the strategy would be monitored by the Medication Safety Committee and overseen by the Drugs and Therapeutics Committee.

Overall, Children’s Health Ireland at Temple Street had some essential elements in place to support effective oversight and governance, however further work was required to comprehensively support medication safety at the hospital. HIQA acknowledges the progress made to support the development of a strategy and a medication programme at the hospital and recognises this as an evolving process which has proceeded in the right direction following the last inspection but needs to be progressed at a faster pace and driven by senior leadership.

**Opportunities for improvement**

- The hospital should progress plans for the development of a medication safety strategy to clearly articulate the short and long-term operational goals for medication safety at the hospital.

### 2.2 Risk management

Medication-related risks were documented on the hospital’s corporate risk register. At the time of inspection there was only one medication-related risk which related to a lack of clinical pharmacy service for all patients. The hospital had demonstrated some progress since the last inspection in relation to this risk including the provision of pharmacy resources specifically for clinical trials and the appointment of a pharmacy technician. Inspectors were also informed that a business case plan for additional clinical pharmacy resources had been put forward to the Children’s Hospital Group but hospital management explained that recruitment was currently on hold throughout the hospital group.

The ongoing lack of a comprehensive clinical pharmacy service for all patients at the hospital remained a concern to HIQA given the size, speciality and complexity of services provided by the hospital. This was highlighted in HIQA’s previous inspection
report in which it was recommended that the hospital prioritise the availability of a clinical pharmacy service for all patients.

**Medication incident reporting**

The prevalence of medication errors and corresponding harm is higher in children than in adults due to greater complexity with respect to prescribing and administration. Children are also at increased risk of harm from medication errors because more steps are usually needed to calculate the proper medication regimen for children and children can also lack the communication skills to avoid potential errors in medication which may cause side effects.

Consistent with HIQA’s previous inspection, inspectors found that there was an established system in place for the reporting of medication safety incidents at the hospital. A total of 373 medication incidents were reported in 2019 year to date compared with 587 incidents reported in 2018. These figures showed an overall decrease from 800 medication incidents reported in 2017. However, increased incident reporting was also encouraged through a ‘good catch system’ where staff were encouraged and supported to report near-miss incidents. Near-misses indicate the potential for medication errors to have occurred. Therefore, reporting near-misses is a first step in preventing medication errors. While the number of medication safety incidents reported were declining compared to previous years, inspectors found that the number of ‘good catches’ reported remained relatively consistent throughout the previous year (see figure 1). Notwithstanding this, the hospital should look to undertake a review of the recent decline in medication safety incident reporting rates and implement the necessary measures to ensure that medication safety surveillance is improved, learning is shared and a safety culture is promoted and enhanced across the organisation.
Figure 1. Number of medication safety incidents and good catches reported October 2018 to September 2019.

The majority of medication incidents were reported by nurses with some reported by clinical pharmacists and low reporting rates by doctors which had also been identified in a previous inspection. The over reliance on nursing staff to report medication incidents needs to be addressed.

Inspectors were informed that all medication incidents that occurred in the hospital were now reported to the State Claims Agency using the National Incident Management System (NIMS) in comparison to the previous inspection in which only incidents which reached the patient were inputted onto NIMS which was a positive finding.

The hospital used the National Coordinating Council for Medication Error Reporting (NCC MERP) index to categorise medication incidents (see Appendix 3).

**Analysis of incidents**

The reporting of incidents is of little value unless the data collected is analysed to identify trends or patterns in relation to risk and the resulting recommendations for improvement are shared with frontline staff.

---

§ An incident is an unplanned, unexpected or uncontrolled occurrence which causes (or has the potential to cause) injury, ill-health, and or damage. An incident can be a harmful incident (adverse event), a no harm incident, a near miss, dangerous occurrence or complaint.

** The State Claims Agencies (SCA) National Incident Management System (NIMS) is a risk management system that enables hospitals to report incidents in accordance with their statutory reporting obligation to the SCA (Section 11 of the National Treasury Management Agency (Amendment) Act, 2000).
Medication incidents and near misses were tracked and trended to assess progress, identify emergent medication safety concerns and prioritise medication safety activities. The hospital had identified safety concerns related to incidents reported and analysed, and had put measures in place to address these risks. For example, in response to an increasing trend of medication incidents associated with analgesia, the hospital developed an analgesia prescribing card in 2019 to support staff with the safe prescribing and administration of analgesia which was viewed by inspectors across all the clinical areas inspected.

One factor which increases incident reporting is the timely provision of feedback to staff on medication incidents reported and the actions required to avert future risks. Medication safety issues or incidents were discussed at the twice daily hospital huddle†† and at safety pauses and clinical handovers in the clinical areas. In addition, medication incident reports were emailed weekly from the risk manager to clinical managers, discussed at the Drugs and Therapeutics Committee and reported to the site Quality and Safety Executive every six weeks. Medication incidents and trends were also discussed as part of the Board of Directors quality Dashboard‡‡ in terms of prescribing incidents which reached the patient, ‘good catches’ or near misses which did not reach the patient.

**Alerts and recalls**

The chief pharmacist received and acted on alerts and recalls§§ related to medication.

**Opportunities for improvement**

- The hospital must address declining rates of incident reporting among all clinical staff, within a just culture,***26 to strengthen reporting of medication incidents, so that safety surveillance is improved.

**2.3 High-risk medications and situations**

High-risk medications require special safeguards to reduce the risk of errors and minimise harm. Strategies for reducing risk with high-risk medications and in high-
risk situations††† may include high leverage, medium leverage or low leverage risk-reduction strategies‡‡‡ (see Appendix 2). High leverage risk-reduction strategies such as forcing functions, standardisation and simplification needs to be implemented alongside low leverage risk-reduction strategies such as staff education, passive information and the use of reminders.

The availability of a high-risk medication list can help hospitals determine which medications require special safeguards to reduce the risk of errors and minimize harm. Children’s Health Ireland at Temple Street did not have a high-risk medications list in place at the time of inspection. Inspectors found that improvements were required in clinical areas visited to ensure staff have a greater awareness of the high-risk medications in use in their clinical areas and the risk-reduction strategies in place to protect patients. To enable this, the hospital should look to develop a high-risk medication list using international literature and locally identified high-risk medications.

The following sample of high-risk medications was reviewed in detail during this inspection to identify the risk-reduction strategies in place:

- concentrated potassium chloride
- insulin
- intravenous paracetamol
- procedural sedation in the Emergency Department.

**Concentrated potassium chloride**

Concentrated electrolyte solutions for injection are especially dangerous with potentially fatal consequences when not prepared and administered properly. National and international evidence recommends the complete removal of concentrated potassium from patient care areas as the goal, with the use of pre-mixed potassium infusions which are stored segregated from other solutions. Documentation reviewed by inspectors outlined that pre mixed bags of potassium chloride had been introduced in the paediatric intensive care unit in 2018. However, the hospital did not currently stock pre-mixed potassium chloride solution on wards. Inspectors were informed that the specific requirements of the hospital’s patient cohort were the reasons premixed potassium chloride solutions had not been introduced to ward areas. The availability of pre-mixed potassium chloride solutions to reduce the requirement for concentrated potassium chloride in all clinical areas

---

††† High-risk situation is a term used by the World Health Organization² to describe situations where there is an increased risk of error with medication use.

‡‡‡ Risk-reduction strategies: a term used to describe different ways of dealing with risks. Strategies include risk avoidance, transfer, elimination, sharing and reducing to an acceptable level.
should be reviewed and risk assessed by the Children’s Health Ireland during future developments.

Concentrated potassium chloride ampoules in use in the hospital did have additional controls in place to support its safe use, for example, concentrated potassium chloride was:

- only stocked in one strength
- stored securely in the controlled medication cupboard
- segregated from other medications
- double checked during preparation and prior to administration
- potassium chloride infusions were administered via electronic infusion pumps.

Commercially available intravenous guidelines on the preparation and administration of intravenous potassium were available in the clinical areas inspected. On review of the policy, inspectors found that not all guidelines on intravenous potassium available in the clinical areas had been locally adapted.

Areas for improvement were noted in the rationalisation of storage and availability of intravenous potassium in some of the clinical areas inspected. For example, three boxes of intravenous potassium were found in one of the clinical areas inspected.

**Insulin**

The hospital had some risk-reduction strategies in place to mitigate against the risks associated with insulin. Examples of these risk-reduction strategies are outlined below:

- the hospital had guidelines to support diabetes care
- the term ‘units’ was used when prescribing insulin
- insulin was double checked prior to administration
- diabetic clinical nurse specialists were available for patient review and education
- insulin pens in use in the hospital were for single patient use only
- staff reported that when insulin pens were first opened, the patient’s details and the date of opening were recorded on the flag label.

During the inspection, one opened insulin pen observed by inspectors did not have a flag label which was required according to staff, however, this was not outlined
in the hospital’s medication policy. The hospital should review and update the medication policy in relation to the labelling of insulin in order to provide clear guidance to staff on the appropriate storage of insulin.

**Intravenous paracetamol**

Intravenous paracetamol:

- was administered via electronic infusion pumps or smart pumps where available
- was only available in one strength
- had guidance available to support staff.

Administration guidelines for intravenous paracetamol were in place incorporating guidance on dose adjustments, however, staff in the clinical areas inspected were unaware that such a guideline was available.

**Procedural sedation in the non-theatre environment**

When sedation is provided in the non-theatre environment the same standard of care is required for each patient throughout the procedure. Sedation should be administered by a well-trained sedation team with oversight provided by a governing committee.\(^3^4\)

During this inspection inspectors visited the Emergency Department which is one of the areas within the hospital where procedural sedation was provided to children. The hospital had set up a temporary working group in the Emergency Department to support the implementation of procedural sedation. Senior hospital managers who spoke with inspectors reported the Emergency Department local governance group provided oversight of procedural sedation audits.

Children undergoing procedural sedation in the Emergency Department were risk assessed prior to the procedure and medication doses were titrated for individual children based on their weight.

Procedural sedation was administered by a consultant in the Emergency Department and the child’s vital signs and observations were monitored by a dedicated trained nurse in procedural sedation. Depending on the type of sedation administered, the child was cared for in different areas of the Emergency Department. For example, sedation with continuous flow nitrous oxide was performed in the rapid assessment and treatment unit and sedation with ketamine or intravenous midazolam was performed in the resuscitation area.
Parents or guardians of children who required procedural sedation were provided with an information leaflet which provided detailed information on how to help the child before, during and after the procedure on discharge.

In line with best practice, only one strength of midazolam was stocked in the unit and reversal agents were readily available. Inspectors were informed that the use of reversal agents would be reported as a medication incident and this was monitored by the pharmacy department.\textsuperscript{35}

Doctors and nurses working in the Emergency Department participating in procedural sedation of children were required to complete a comprehensive training programme in procedural sedation. This programme was multifaceted and included in addition to the procedural manual lectures, multiple choice examination and direct bedside sedation training. Clinical staff were required to complete basic life support training, paediatric life support and or advance paediatric life support training.

Overall, the process for procedural sedation in the Emergency Department reviewed by inspectors on the day of the inspection was found to be in line with best practice guidelines \textsuperscript{36,37} and the hospital’s procedural sedation manual.

**Other high-risk medications**

Additional findings in relation to high-risk medications and associated risk reduction strategies are outlined below:

The hospital did not identify a list of sound–alike look-alike medications (SALADs), however inspectors were provided with SALAD posters which had been circulated to the clinical areas and included information on how to reduce the risk of error when prescribing and administering SALADs such as; writing clearly in block capitals, including the indication for the medication when prescribing and minimising close storage of similar packaging. Inspectors also viewed examples of SALAD stickers in some of the clinical areas inspected.

The hospital had a separate antimicrobial prescribing section on the medication record, with a section to record therapeutic drug monitoring levels to support safe administration. The hospital’s antimicrobial guidelines and intravenous administration guidelines provided guidance for staff. However, during the course of this inspection, inspectors identified conflicting information on the hospital’s laboratory system and in the hospital policy to advise staff regarding safe blood levels prior to administration of a particular intravenous antimicrobial and this had recently resulted in a patient safety incident.

Inspectors were not satisfied that adequate control measures had been put in place to prevent this error from reoccurring and sought assurances from hospital management during this inspection. Following further review of this risk hospital
management provided the inspection team with formal assurances in writing outlining the actions the hospital had taken to address this situation to prevent a reoccurrence.

A sample of medication prescription and administration records reviewed indicated that there were opportunities for improvement in documenting the indication and target levels of antimicrobials as required by the medication administration record. In addition, opportunities for improvements were also identified in prescribing practices associated with paracetamol in accordance with the hospital’s policy.

Overall, Children’s Health Ireland at Temple Street had implemented some risk-reduction strategies for high-risk medications. However, there was further scope to improve awareness and oversight of these medications and implement higher-leverage, evidence-based risk reduction strategies to protect patients against the harm associated with high-risk medications.

Correspondence received from the hospital following this inspection outlined the immediate actions the hospital proposed to take to improve awareness of high risk-medications within the hospital in response to inspection findings. These included:

- rationalisation of the availability of high-risk medications to ensure limited supplies available in clinical areas. The hospital committed to support this by continuous auditing to ensure only the required amounts are stored in clinical areas.
- clinical areas will be supplied with laminated posters using the APINCH\textsuperscript{555} acronym to alert staff of high-risk medications within clinical areas.
- immediate dissemination of an all staff communication to raise awareness of the APINCH acronym
- labelling of all high-risk medications and development of a SALAD guideline at the cross hospital Children’s Health Ireland Drugs and Therapeutics Committee.

**Opportunities for improvement**

- The hospital should review existing systems and oversight arrangements in place for high risk medications and consider the introduction of higher leverage risk reduction strategies to reduce risks associated with high risk medications. In addition the hospital must:

\textsuperscript{555} the ‘APINCH’ acronym and classification is widely used to assist clinicians focus on a group of medicines known to be associated with high potential for medication-related harm.
• review the use and storage of concentrated potassium in general ward areas
• review the systems in place for storage and labelling of high-risk medications to promote standardisation
• ensure staff are aware of high-risk medications in use within clinical areas and associated hospital policies to guide practice
• monitor the implementation of risk reduction strategies and adherence to hospital policies in relation to high risk medications.

2.4 Person centred care and support

Patients should be well informed about any medications they are prescribed and any possible side effects. This is particularly relevant for those patients who are taking multiple medications.38, 39

Patient information

Inspectors were informed that medication information was provided to parents or guardians and patients from the multidisciplinary team, predominantly from clinical nurse specialists and speciality pharmacists, as well as from doctors and nurses.

Inspectors observed examples of patient information leaflets available in the clinical area which included information on pain relief on discharge and procedural sedation.

Medication reconciliation

Medication reconciliation is a systematic process conducted by an appropriately trained individual, to obtain an accurate and complete list **** of all medications that a patient is taking on admission, discharge and other transitions in care.40, 41,42

In Children’s Health Ireland at Temple Street, medication reconciliation was not formally undertaken for all patients. Patients who had a dedicated speciality pharmacist would often have their medication reviewed on admission and discharge by the pharmacist who would make contact with a community pharmacist as required.

In response to HIQA’s previous medication safety inspection which identified the need to further develop, formalise and introduce medication reconciliation throughout the hospital, the pharmacy department had undertaken a medication reconciliation audit to determine the impact of pharmacist led medication reconciliation on medication optimisation. A total of 24 medication administration charts had been reviewed and findings demonstrated that 88% of charts contained at least one error. The audit concluded that clinical pharmacists are well placed to

**** ‘A Best Possible Medication History (BPMH) is a medication history obtained by a clinician which includes a thorough history of all regular medication use (prescribed and non-prescribed), using a number of different sources of information.
conduct medication reconciliation in order to improve medication optimisation at the hospital and to reduce the risk of prescribing errors reaching patients.

HIQA acknowledges the challenges, complexity and resource requirement to implement an effective medication reconciliation process and recognises the work completed by the pharmacy department in evaluating the impact of a medication reconciliation service at the hospital. This included the development of a medication reconciliation template to support formal medication reconciliation service at the hospital. The hospital needs to work towards establishing and progressing medication reconciliation for all patients on admission and discharge.

**Systems to support medication safety and optimisation**

The hospital reported that medication optimisation was supported by:

- participation of clinical pharmacists in ward rounds and clinics
- provision of pharmacy services to high risk patients including medication reviews
- clinical pharmacists providing services such as:
  - weaning plans for sedatives
  - review and discussion of adverse drug reactions and interactions
- patient education and support provided by clinical nurse specialists who were available for the majority of speciality areas
- smart pump technology and standardised concentration drug library††††

Patient weight measurements are important for medications that require an individual weight-based dose and patient known medication allergies should be available throughout the episode of care. Patient’s weights and allergies were recorded on all medication records reviewed by inspectors.

**Opportunities for improvement**

- The hospital needs to work towards establishing medication reconciliation for all patients on admission, and progress towards the development of this service to include all patients on discharge.

†††† Smart-pumps are computerised infusion devices with multiple safety features that include customised medication libraries, dose calculations based on programmed patient weights and the setting of dose limits. They have been shown to be highly effective in reducing serious and occasionally fatal medication errors. [https://www.ehealthireland.ie/Case%20Studies/National-Smart-Pump-Drug-Library-of-Paediatric-and-Neonatal-Standardised-Concentration-Infusions/]
The hospital should look to have formal structured systems in place for patient education on medication, and also review the availability of medication information leaflets for patients.

### 2.5 Model of service and systems in place for medication safety

Paediatric pharmacy practice ensures the safe and effective use of medications for all children from neonates through to adolescents. The practice includes direct patient care for children, often provided through inter-professional healthcare teams, as well as advocacy and education for children and their families. International studies support the role of clinical pharmacy services in hospital wards in preventing adverse drug events.

The pharmacy department was led by the chief pharmacist and there were five whole time equivalent (WTE) senior pharmacist positions employed by the hospital providing cover Monday to Friday. This was an increase in pharmacy resources since the previous HIQA medication inspection in 2018, however, inspectors were informed that this position comprised of 0.5 WTE clinical trials and 0.5 WTE clinical pharmacy. Similar to previous inspection findings, a clinical pharmacy service was not provided in all clinical areas. However, access to clinical pharmacy was available to all clinical areas via a bleep system.

The lack of clinical pharmacy service in all clinical areas was of concern to HIQA given the tertiary referral profile of the hospital and the complexity of services provided at the hospital. As the transfer of paediatric patients between primary, secondary and tertiary care is a recognised source of medication error, paediatric pharmacy services occupy a pivotal role in the current and proposed paediatric model of care. The pharmacy department had undertaken a review of clinical pharmacy services at the hospital and identified the minimum requirements necessary to bring the department in line with similar paediatric hospitals. This included an additional 11 pharmacy posts and three pharmacy technician posts.

HIQA acknowledges actions taken by hospital management to increase pharmacy resources and recognises that the hospital must now be supported by the hospital group to ensure pharmacy staffing levels reflect the size and complexities of the

---

Clinical pharmacy service refers to the activity of pharmacy teams in ward and clinic settings. The following core activities are involved in providing clinical pharmacy services: prescription monitoring, prescribing advice, optimising therapeutic use of medicines, adverse drug reaction detection and prevention, patient education and counselling, inter-professional education about medicines. It may also involve some or all of the following: medication history taking, medication reconciliation, specialist clinics e.g. HIV, clinical audit, protocol/guideline development. Source: Pharmaceutical Society of Ireland. *Future Pharmacy Practice in Ireland - Meeting Patients’ Needs.* Dublin; 2016. Pharmaceutical Society of Ireland.
services provided in line with other tertiary referral paediatric hospitals and the National Model of Care for Paediatric Healthcare Services in Ireland.\textsuperscript{44}

Since the last medication safety inspection, the hospital had committed to undertake a review of a formulary in use in another hospital within Childrens’ Health Ireland and had recently held a meeting to agree a process for working towards a joint formulary within Childrens’ Health Ireland. Consequently, the development of a local hospital formulary was placed on hold in order to facilitate this. In the interim, the hospital was reviewing their list of medicines approved for use in the hospital.

**Opportunities for improvement**

- The hospital should continue to progress the recruitment of pharmacy staff and to examine how best to allocate the resources to ensure that high-risk patient areas are prioritised and oversight arrangements for medication management and safety are effective.

- The hospital should progress the development of a hospital formulary within Childrens’ Health Ireland.

**2.6 Use of information**

Hospitals should support clinical staff in achieving safe and effective medication use through the availability of up-to-date evidence-based information and decision support tools for medications.\textsuperscript{11,15}

Children’s Health Ireland at Temple Street had a number of medication information sources available for staff such as:

- Medication protocols and guidelines
- Antimicrobial guidelines
- British National Formulary for children

Commercially available paediatric injectable guidelines were available to staff on ward computers. However, similar to the previous inspection, not all injectable medicines guidelines had been locally adapted or available to staff at the point of medicines preparation in all clinical areas visited by inspectors. Hospital management outlined that funding had recently been secured for the introduction of computer tablets or laptops to ensure that information is readily available electronically to staff at the point of medication administration. However, it was reported that due to external project constraints and connectivity issues there were delays with implementing these devices in clinical areas.
The Drug and Therapeutics Committee had secured funding to purchase NEWT guidelines and inspectors were informed that the hospital group had established a clinical guidelines committee with a view to streamlining guidelines throughout Children’s Health Ireland.

Medication information, alerts and safety notices were displayed on information boards.

It is recommended, by both the Health Service Executive and the National Clinical Effectiveness Committee that policies, procedures and guidelines are reviewed and updated every three years. The hospital had a suite of medication-related policies, procedure and guidelines, however, some guidance documents reviewed by inspectors were overdue for review.

**Opportunities for improvement**

- Up-to-date, evidenced-based and locally adapted medicines information should be accessible to staff at all stages of the medication management process including preparation of medications.

**2.7 Monitoring and evaluation**

Monitoring of medication safety should be formally planned, regularly reviewed and centrally coordinated with resulting recommendations actioned and the required improvements implemented.

HIQA previously identified clinical audit as an area that could be further developed to provide assurance that systems in place to support medication safety at the hospital are safe and effective. At the time of inspection, the hospital did not have a clinical audit plan. Inspectors were informed that the development of a medication safety audit plan would be one of the priorities for the medication safety committee in 2020.

Audits were usually centrally coordinated by the audit facilitator. Staff were required to complete an application form on the commencement of a clinical audit.

Evidence of monitoring and evaluation of medication safety provided to inspectors for the past two years consisted of:

- medicines reconciliation audit
- procedural sedation in the paediatric emergency department
- analgesia prescribing audit
- medication storage audit

---

5555 Information to guide the administration of medication to patients with swallowing problems.
- nursing and midwifery quality care metrics

Nursing and midwifery quality care metrics, monitored on a monthly basis included a number of elements that focused on medication management. Results reviewed by inspectors for 2017 and 2018 outlined good compliance with scheduled controlled medication with some opportunities for improvement across medication storage and custody and administration.

The hospital had introduced a web based communication system called the ‘HOVER system’ in June 2019 in an effort to reduce the amount of bleeps from nurses to doctors regarding non-urgent tasks and out of hours tasks. A review of the system found that the most common tasks were medication prescriptions especially on surgical wards. Inspectors were informed that the system has had a positive impact on medication safety by streamlining the process for notifying doctors of the requirement to review and rewrite medication administration records out of hours.

Medication safety audits undertaken identified areas for improvement as some audits reviewed did not outline the required action or quality improvement plans, timeframes, persons responsible or re-audit plans, to ensure the desired improvements have been achieved.

Dissemination of audit and key performance results is essential so that the clinical workforce is informed of areas that need improvement and also to motivate them to participate in improvement activities and improve practice. Inspectors were informed that audit results were discussed at various forums including the Drugs and Therapeutics Committee and Quality and Patient Safety Committee meetings. Audit results were also disseminated to frontline staff during safety pauses and clinical handover. The hospital held twice yearly audit days with oral presentations and posters displayed.

Medication safety audits should be planned and based on local priorities to provide assurance to the senior hospital management team about medication safety at the hospital. Overall, the hospital demonstrated evidence of some clinical audit and monitoring in relation to medication safety. However, inspectors found that audit and monitoring of medication safety could be further developed and improved as only a limited number of medication audits were completed within the previous two years. Senior management acknowledged that improvements could be made in relation to clinical audit at the hospital.

***** Metrics are parameters or measures of quantitative assessment used for measurement and comparison or to track performance.
Opportunities for improvement

- Evaluation and monitoring of the use and safety of medication should be planned in line with the hospital’s overall priorities and aligned to a medication safety strategy.

- Time bound recommendations and action plans should be identified and implemented from audit findings, with oversight from hospital management to ensure required achievements are achieved.

2.8 Education and training

Staff education can effectively augment error prevention when combined with other strategies that strengthen the medication-use system. Children’s Health Ireland at Temple Street had a structured induction programme of education for medication safety for doctors and nurses.

All registered nursing staff were required to complete mandatory medication safety awareness training which included a medicine calculation test and an associated competency booklet. Following completion of the medication safety awareness training programme nurses were then eligible to complete the mandatory intravenous therapy management day. If poor performance in medication safety was identified nursing staff were required to repeat medication safety awareness training. HIQA acknowledges the importance of promoting a culture of professional responsibility for practice, however, it is important that such an approach is complemented by an evaluation of potential system related causes for latent error, which should also form a focus for error reduction efforts allied to improved staff vigilance.

Since the last inspection, inspectors were informed that it was now mandatory for doctors to complete a prescribing skills workshop††††† which had been developed by the hospital. This was facilitated twice a year by the chief pharmacist with additional sessions provided if poor attendance at these sessions occurred.

All new pharmacists were encouraged to attend the Neonatal Paediatrics Pharmacist Group ‘Starting Out in children’s Medicines Optimisation’ study day.

††††† The hospital had developed a prescribing skills workshop for Temple Street University hospital. This workshop incorporated information on medication safety, correct prescribing and the use of the British National Formulary for Children.
Opportunity for improvement

- The hospital should ensure that professionals have the necessary competencies to deliver high-quality medication safety through induction and ongoing training. This could be supported by developing a structured targeted ongoing programme of education for medication safety aligned to the hospital’s medications safety programme.\(^\text{11}\)
3. Summary and conclusion

Medications play a crucial role in maintaining health, preventing illness, managing chronic conditions and curing disease. However, errors associated with medication usage constitutes one of the major causes of patient harm in hospitals and the impact of medication errors can be greater in certain high-risk situations. Understanding the situations where the evidence shows there is higher risk of harm from particular medications and putting effective risk-reduction strategies in place is key for patient safety.

Children’s Health Ireland at Temple Street had governance arrangements in place with some systems and processes to support medication safety in the hospital, however further work was required to drive improvement with medication safety at the hospital.

At the time of this inspection Children’s Health Ireland at Temple Street did not have a medication safety strategy or medication safety programme in place. The lack of clearly defined objectives, operationally led by an identified person was a potential barrier to advancing a medication safety agenda at the hospital. Notwithstanding this, the hospital had developed a quality improvement plan since the last inspection and had demonstrated some progress across areas identified for improvement. The hospital should now progress and effectively implement the medication safety objectives for 2020 as articulated by senior management during this inspection.

Given the greater complexity with prescribing and administration of medication for children and the higher potential for harm when an error does occur, the lack of clinical pharmacy services for all patients was a potential risk to patient safety and remained a concern to HIQA. Notwithstanding the progress made to date to improve clinical pharmacy resources, the hospital should work to assure itself that the current pharmacy service is utilised most appropriately and prioritise high risk areas in order to mitigate risk and promote patient safety.

Overall, Children’s Health Ireland at Temple Street had implemented some risk-reduction strategies for high-risk medications. However, there was further scope to improve awareness and oversight of these medications and implement evidence-based higher-leverage strategies to protect patients against the harm associated with high-risk medications. The hospital must ensure that the actions outlined to HIQA in response to the findings associated with high-risk medications are effectively implemented to provide assurance of medication safety at the hospital.

In conjunction with this medication reconciliation should be further developed, formalised and introduced throughout the hospital.
HIQA acknowledges that while some prescribing and administration supports were available for staff involved in medicines management, the overarching finding was that not all information available had been locally adapted and the information was not consistently available at the point of care in all clinical areas. Plans to install tablets and laptops within clinical areas should be prioritised and expedited.

Inspectors found that audit and monitoring of medication safety could be further developed and strengthened in order to provide additional assurances around medication safety practices at the hospital.

This report should be shared with relevant staff at Children’s Health Ireland at Temple Street and the Children’s Hospital Group to highlight the findings from this inspection including what has been achieved to date and to foster collaboration in relation to opportunities for improvement.

The opportunities for improvement highlighted in this report requires renewed focus for leadership and management at the hospital to ensure that medication safety is seen as a priority and that patients are protected from known and avoidable harm.

HIQA recommends that the hospital continues to collaborate within the hospital group’s structure, to share good practice pertaining to medication safety and to develop and implement national policies and practices for medication management.
4. References


### 5. Appendices

**Appendix 1: Lines of enquiry and associated National Standards for Safer Better Healthcare.**

<table>
<thead>
<tr>
<th>Area to be explored</th>
<th>Lines of enquiry</th>
<th>Dimensions/ Key Areas</th>
<th>National Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership, governance and management</td>
<td>1. Patient safety is enhanced through an effective medication safety programme underpinned by formalised governance structures and clear accountability arrangements.</td>
<td>Capacity and capability</td>
<td>3.7, 5.1, 5.2, 5.5, 5.4, 5.6, 5.11</td>
</tr>
<tr>
<td>Risk management</td>
<td>2. There are arrangements in place to proactively identify report and manage risk related to medication safety throughout the hospital.</td>
<td>Quality and Safety</td>
<td>3.1, 3.2, 3.3, 3.6, 5.8, 5.11, 8.1</td>
</tr>
<tr>
<td>High-risk medications</td>
<td>3. Hospitals implement appropriate safety measures for high-risk medications that reflect national and international evidence to protect patients from the risk of harm.</td>
<td>Quality and Safety</td>
<td>2.1, 3.1</td>
</tr>
<tr>
<td>Person centred care and support</td>
<td>4. There is a person centred approach to safe and effective medication use to ensure patients obtain the best possible outcomes from their medications.</td>
<td>Quality and Safety</td>
<td>1.1, 1.5, 3.1, 2.2, 2.3</td>
</tr>
<tr>
<td>Model of service and systems for medication management</td>
<td>5. The model of service and systems in place for medication management are designed to maximise safety and ensure patients' healthcare needs are met.</td>
<td>Quality and Safety</td>
<td>2.1, 2.2, 2.3, 2.6, 2.7, 3.1, 3.3, 5.11, 8.1</td>
</tr>
<tr>
<td>Use of Information</td>
<td>6. Essential information on the safe use of medications is readily available in a user-friendly format and is adhered to when prescribing, dispensing and administering medications.</td>
<td>Quality and Safety</td>
<td>2.1, 2.5, 8.1</td>
</tr>
<tr>
<td>Monitoring and evaluation</td>
<td>7. Hospitals systematically monitor the arrangements in place for medication safety to identify and act on opportunities to continually improve medication.</td>
<td>Quality and Safety</td>
<td>2.8, 5.8</td>
</tr>
<tr>
<td>Education and training</td>
<td>8. Safe prescribing and drug administration practices are supported by mandatory and practical training on medication management for relevant staff.</td>
<td>Capacity and capability</td>
<td>6.2, 6.3</td>
</tr>
</tbody>
</table>
Appendix 2: Hierarchy of effectiveness of risk-reduction strategies in medication safety.

Reprinted with permission from ISMP Canada

Definitions

Harm
Impairment of the physical, emotional, or psychological function or structure of the body and/or pain resulting there from.

Monitoring
To observe or record relevant physiological or psychological signs.

Intervention
May include change in therapy or active medical/surgical treatment.

Intervention Necessary to Sustain Life
Includes cardiovascular and respiratory support (e.g., CPR, defibrillation, intubation, etc.)

© 2001 National Coordinating Council for Medication Error Reporting and Prevention. All Rights Reserved. Permission is hereby granted to reproduce information contained herein provided that such reproduction shall not modify the text and shall include the copyright notice appearing on the pages from which it was copied.