



**Health
Information
and Quality
Authority**

An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

Report of the announced inspection of medication safety at Cappagh National Orthopaedic Hospital.

Date of announced inspection: 27 February 2019

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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.
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- **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.

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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*¹ 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.²

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.³ 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.^{4,5,6,7,8,9} 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.¹⁰

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*'¹¹ 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 Cappagh National Orthopaedic Hospital by Authorised Persons from HIQA; Aoife Lenihan, Nora O Mahony and Kay Sugrue. The inspection was carried out on 27 February 2019 between 09:00hrs and 16:10hrs.

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

- High dependency unit
- Theatre 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, the risk and safety manager and the medication safety officer.
- Group two: the director of nursing, the deputy chief executive officer and the chair of the Hospital Medical Board

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

Information about the hospital

Cappagh National Orthopaedic Hospital is a stand-alone elective orthopaedic voluntary hospital in the Ireland East Hospital Group. The hospital provides elective orthopaedic surgery and an acute rehabilitation service.

2. Findings at Cappagh National Orthopaedic 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

Cappagh National Orthopaedic Hospital had a Drug and Therapeutics Committee in place in line with best practice.^{15,16} The committee had responsibility for overseeing all processes relating to medication safety in the hospital and was accountable to the Hospital Medical Board through a formalised reporting structure. Overall corporate responsibility for oversight of medication safety within the hospital rested with the clinical director.

The hospital had developed a time bound quality improvement plan in response to findings identified during the last HIQA medication safety inspection.¹⁷ Significant progress had been made in relation to identified improvements required by the committee. For example, some of the notable measures implemented by the Drugs and Therapeutics Committee included:

- the review and strengthening of its governance and reporting arrangements
- the establishment of a process for evaluating the effectiveness of the Drugs and Therapeutics Committee, the results of which were reported in the Drugs and Therapeutics Committee Annual Report
- instituting the role of a medication safety co-ordinator
- defining a medication safety programme for the hospital
- improving compliance with its terms of reference.

The Drugs and Therapeutic Committee had multidisciplinary membership which had broadened since 2017 to include a representative from the acute rehabilitation service. However, there was still scope to expand the membership to include specialist and community representation to support governance and oversight for all areas and services provided by the hospital. Inspectors were informed that the chair of the committee acted as a link to communicate issues relating to medication safety to consultant orthopaedic surgeons and back to the committee.

The hospital also had a Medication Management Committee which reported to the Drugs and Therapeutic Committee. Inspectors found that the hospital had a clear and focused annual medication safety programme for 2018 and 2019 with priorities for each objective outlined within the programme. Inspectors found that objectives defined in the 2018 medication safety programme had been actively progressed by

the Medication Management Committee. An annual report was produced by the Medication Management Committee and regular updates provided to the Drugs and Therapeutics Committee. However, there was scope to provide further focus and direction to the medication safety agenda by setting out short and long-term goals for the organisation through the development of a medication safety strategy.

Opportunities for improvement

- The hospital should review the membership of the Drugs and Therapeutic Committee to ensure it is reflective of the services provided by the hospital, with representatives from all the major specialities in attendance.
- The hospital should look to develop a medication safety strategy to clearly articulate the short and long-term operational goals for medication safety.

2.2 Risk management

Medication related risks requiring additional control measures were documented on the hospital's corporate risk register. Twelve medication safety related risks were recorded, risk rated and regularly reviewed on the risk register viewed by the inspection team. Some risks had been on the risk register for an extended period of time, although they had been recently reviewed.

Incidents[§] that occurred in the hospital were reported to the State Claims Agency using the National Incident Management System^{**} (NIMS).¹⁸ A total of 73 medication incidents were reported in 2018 which showed a pattern of decrease in incidents reported since 2016 (see figure 1). However, the number of incidents resulting in patient harm had also significantly reduced in the same period.

Inspectors were informed that feedback on reported medication incidents was sent to each clinical area on a quarterly basis and discussed at handover. Overall, staff who spoke with inspectors showed a general awareness on improvement measures implemented on learning gained from analysis of medication incidents.

[§] 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).

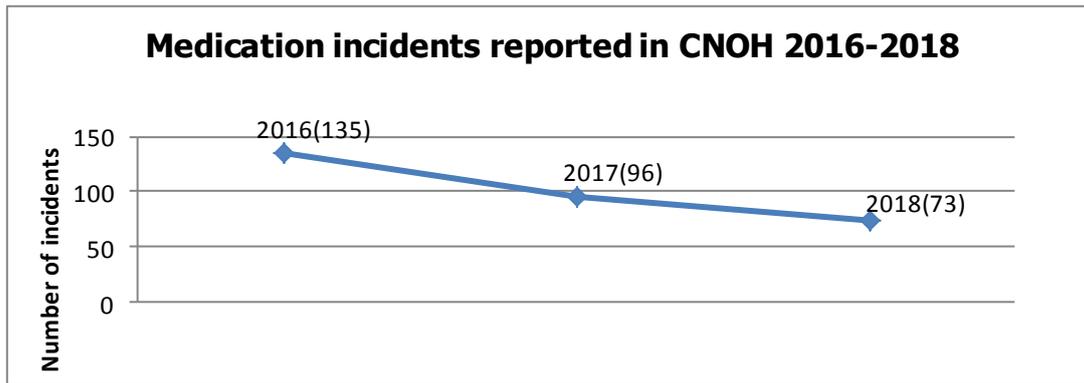


Figure 1. Medication incidents reported 2016 to 2018

Analysis of incidents

Inspectors reviewed medication incident reports for 2018 developed by the Medication Management Committee and reported to the Drugs and Therapeutics Committee. These reports used the National Coordinating Council for Medication Error Reporting (NCC MERP) index to categorise medication incidents (see Appendix 3) and also sub-categorised incidents to where the incident occurred.

Inspectors were informed that root cause analysis was routinely undertaken for all medication incidents graded E⁺⁺ or above using the National Coordinating Council for Medication Error Reporting (NCC MERP) index to categorise medication incidents (see Appendix 3).

In addition all incidents involving high-risk medications were reviewed. A significant number of interventions made by pharmacists through the medication reconciliation process on admission and discharge were recorded and monitored on a monthly basis as a pharmacy key performance indicator. Inspectors were informed that these interventions were not routinely analysed or recorded as incidents as they may not have necessarily met the criteria of a near miss. However, there was potential that some identified intervention could possibly lead to a near miss or prescribing error. Inspectors identified that there was potential to gain further learning on issues relating to medication safety through evaluation of the data collected daily by pharmacists.

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.¹⁹

⁺⁺ NCC MERP Grade E medications incidents are incidents that may contribute to or result in temporary harm to the patient and require interventions.

Alerts and recalls

The chief pharmacist received and acted on alerts and recalls⁺⁺ related to medication if relevant to the service. An example of the action taken in response to a recent alert was outlined to inspectors.

Opportunities for improvement

- The hospital must promote incident reporting among all clinical staff and across all clinical areas within a just culture,^{§§20} to strengthen reporting of medication incidents so that safety surveillance is improved.
- The hospital should ensure that all data collected relating to medication safety is analysed and trended to identify patterns of risk and incidents to inform interventions needed to minimise the risk to patients.

2.3 High-risk medications/situations

High-risk medications require special safeguards to reduce the risk of errors and minimise harm. High-risk situation is a term used by the World Health Organization^{Error! Bookmark not defined.} to describe situations where there is an increased risk of error with medication use. 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 for more information).

Cappagh National Orthopaedic Hospital had developed a high-risk medications list referred to as high-alert medications (HAMs), using international literature and locally identified high-risk medications which was reviewed and updated regularly.

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

- anticoagulants⁺⁺⁺
- concentrated potassium chloride
- opioids
- medication management during the perioperative period.

⁺⁺ Recalls are actions taken by a company to remove a product from the market. Recalls may be conducted on a firm's own initiative or by authorised authority.

^{§§} The framework of a just culture ensures balanced accountability for both individuals and the organisation responsible for designing and improving systems in the workplace.

^{***} 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.

⁺⁺⁺ Anticoagulants: are commonly referred to as blood thinners that prevent or treat blood clots, but these medications also carry an increased risk of bleeding or clots, so patient education and regular monitoring of blood levels are essential to maintain patient safety and ensure good patient outcomes.

Anticoagulants

The hospital had a combination of risk-reduction strategies in place to mitigate against the risks associated with anticoagulants such as segregated storage (segregated high-risk containers), labelling, daily clinical pharmacy review, patient specific dispensing, guidance and a double check system for all hospital identified high- risk medications.

Higher strength low molecular weight heparins (LMWH)⁺⁺⁺ were listed as high-risk medications and were not routinely stored on the wards in line with the hospital's policy on the management of high-risk medications. Unfractionated heparin was not routinely stocked on general wards and mainly restricted to the theatre department. If prescribed, unfractionated heparin and higher dose LMWHs were only dispensed to individual named patients which were stored securely in patients' own drugs lockers (colloquially known as PODs^{§§§}) at the patient bedside.

Direct oral anticoagulants^{****} (DOACS) were not routinely stored as ward stock and only dispensed from pharmacy as patient specific and labelled as high-risk medications. Patient specific DOACs and patient's own drugs were stored separately in clear zip lock bags with 'HIGH ALERT' printed in red on the bag along with patient hospital identification details.

Inspectors were informed that due to the elective nature of the orthopaedic service provided and in line with perioperative management of medications, warfarin was rarely used in the hospital. However, high-risk medications risk reduction strategies were in place to manage patients requiring continued warfarin therapy if needed. These strategies were underpinned by a hospital policy which included the pre and post-operative guidance on the management of patients on warfarin. Only one brand of warfarin was stocked in the hospital to reduce the risk of error. A separate warfarin administration record was available. Staff who spoke with inspectors said a blue sticker was applied to the medication record to alert staff that the patient was on warfarin.

The inspection team was informed that the current long stay medication record forms were under review with plans to include recommended venous thromboembolism (VTE) prophylaxis as part of the revised edition which is to be implemented in 2019.

⁺⁺⁺ Heparin is an anticoagulant specifically used in the initial treatment and prevention of deep vein thrombosis, pulmonary embolism, and arterial thromboembolism.

^{§§§} Patients' own drugs (PODs) are medications that patients have obtained in the community setting and bring to the hospital when admitted.

^{****} Direct oral anticoagulants: Options for anticoagulation have been expanded recently with the introduction of new anticoagulants called direct oral anticoagulants.

Concentrated potassium chloride

Inspectors viewed a number of risk-reduction strategies to mitigate against the risks associated with concentrated potassium chloride.

Concentrated potassium chloride ampoules were not routinely stocked on general wards but were restricted to approved areas such as the High Dependency Unit and Theatre Department. In these areas outside pharmacy, concentrated potassium chloride ampoules was stored separately in a secured safe.

Concentrated potassium chloride was labelled as a high-risk medication in line with hospital policy. However, inspectors found that risk reduction strategies such as individual 'must be diluted' labels on individual concentrated potassium ampoules were not in use in line with best practice.²¹

Pre-mixed solutions containing potassium chloride were dispensed by pharmacy and used in general wards. However, inspectors were informed that pre-mixed solutions were not routinely used in the High Dependency Unit. Instead staff prepared infusions with concentrated potassium as required. This practice was not in line with hospital policy which recommended that pre-mixed solutions should be used wherever possible even in areas approved to store concentrated potassium chloride.

Intravenous pumps were used for the administration of concentrated electrolyte solutions in the High Dependency Unit and all patients were monitored.

Medication records specifically used for short stay patients in the post-operative phase of care had printed prescriptions for potassium chloride 15% and magnesium sulphate. However, standardised locally approved infusion rates were not printed for these prescriptions.

Opioids

In a setting that specialises in orthopaedic surgery, pain management is central to patient management and recovery. The hospital had implemented a number of risk-reduction strategies to mitigate risks associated with opioids and promote optimal pain management for patients undergoing major surgery which included;

- Hydromorphone was not stored in the clinical areas assessed
- segregated storage of similar sounding opioids and opioids listed as high-risk medications were stored in containers marked as high-risk medications
- coloured oral syringes were used for the administration of oral morphine to paediatric patients
- printed standardised prescriptions for intravenous bolus prescriptions of morphine sulphate and fentanyl citrate

- restricted administration of intravenous morphine to the High Dependency Unit and Theatre Department
- a double check verification of the opioid administered
- alert sticker for intrathecal morphine administration
- continuous monitoring of patients administered intravenous morphine
- a step-down plan for opioid analgesic reduction
- a pain monitoring flow sheet
- supporting hospital guidance such as local policies and desktop access to locally approved opioid conversion charts

In addition to the above controls, a clinical nurse specialist in pain management was available to staff as an additional support and a valuable source of information. The clinical nurse specialist also provided one-to-one information and counselling to patients on pain management issues and staff training in matters relating to administration of analgesics and pain management as required.

Inspectors were informed that reversal agents were available but rarely used. However, the use of reversal agents did not act as a trigger for review or required to be reported as a medication incident.

Medication management during the perioperative period

A hospital's operating theatre presents a unique situation with the use of multiple high-risk medications, high patient throughput and complex procedures.²² A diverse range of medications are used which have the potential for a serious adverse event if administered incorrectly.²³ Therefore, the perioperative period is a high-risk situation in relation to medication safety.

Examples of risk-reduction strategies in place to mitigate against the risks of medications used within the theatre department are outlined below:

- colour-coded trays aligned with international labeling systems were used for storing drawn up emergency medications and local anaesthetic injections
- international colour-coded labeling of drawn up medications applied in practice
- standardised storage of anaesthetic medications in all theatre areas assessed
- colour-coded administration pumps were used to differentiate modes of administration such as peripheral nerve block, epidural or patient controlled analgesic
- high-risk medications were stored separately in line with hospital policy
- patient specific pharmacy dispensing for high-risk epidural infusion
- emergency drugs were drawn up by consultant anaesthetist at the start of each day, stored separately in a tray and disposed of at the end of each case.

- anaesthetic medications were drawn up, reconciled and if not used were discarded at the end of each theatre procedure
- medications were prepared, labelled and administered by the same doctor for elective surgeries
- red allergy bands in place to identify patients with allergies during the perioperative period
- patient identification and drug allergies were checked prior to drug administration.

There was evidence of good communication regarding medications administered at transitions of care right throughout the perioperative patient pathway. The anaesthetic record sheet was attached to the patient's medical record on the patient's transfer from the theatre recovery room to the ward.

Inspectors were informed that a double checking system was not in place relating to anaesthetic medications.

Other high-risk medications

Examples of risk-reduction strategies in place to mitigate the risks for other high-risk medications and situations were also identified during this inspection and are outlined below:

- Sound-alike look-alike medications (SALADs)⁺⁺⁺⁺ were included on the hospital high-risk medications list and labelled the same way as other high-risk medications. The system of treating SALADs in the same way as high risk medications may not clearly alert staff to the specific risks associated with SALADs.
- Insulins not in use were appropriately stored in a temperate controlled fridge and labelled as high-risk medication. However inspectors were informed that these vials were multi-dose once opened and not patient specific in line with recommended best practice.²⁴
- The hospital stocked one strength of intravenous paracetamol for adults. Lower strength dose was not available for paediatric patients which meant that staff had to withdraw appropriate volume of fluid when dosage was adjusted to individual patient characteristics. In addition, medication records viewed showed that prescriptions of paracetamol allowed intravenous and oral administration routes in the same prescription. It was explained to

⁺⁺⁺⁺ SALADs are 'Sound-alike look-alike drugs'. The existence of similar drug/medications names is one of the most common causes of medication error and is of concern worldwide. With tens of thousands of drugs currently on the market, the potential for error due to confusing drug names is significant.

inspectors the intravenous paracetamol was rarely administered beyond the first 24 hour post-operative period when most intravenous access is removed.

Overall, Cappagh National Orthopaedic Hospital had a comprehensive policy on high-risk medications relevant to the service provided and had implemented a combination of low, medium and higher-leverage risk-reduction strategies which were observed by inspectors in practice. Staff who spoke with inspectors had a strong awareness of the high-risk medications available in their clinical areas and the risk-reduction strategies in place.

Opportunities for improvement

- The hospital should review the processes in place to manage SALADs to ensure alignment with best practice.
- The use of multidose insulin vials should be reviewed to ensure consistency and standardised practice within the hospital and in line with best practice.
- The hospital should review the practice of only stocking on strength intravenous paracetamol in the context of the adult and paediatric care provided.

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.^{25, 26}

National patient experience survey

The Cappagh National Orthopaedic Hospital National Patient Experience Survey^{****} was completed by 178 patients discharged from the hospital in May 2018. Two questions related directly to medication in the National Patient Experience Survey. The scores for the Cappagh National Orthopaedic Hospital and the national scores for both 2017 and 2018 are illustrated in table 1 below.

**** The National Patient Experience Survey was a nationwide survey which asked people for feedback about their stay in hospital. The survey was a partnership between the Health Service Executive (HSE), HIQA and the Department of Health. All adult patients discharged during May 2017 who spent 24 hours or more in a public acute hospital, and have a postal address in the Republic of Ireland were asked to complete the survey.

Questions	Year	Cappagh National Orthopaedic Hospital score	National score
Q44. Did a member of staff explain the purpose of the medicines you were to take at home in a way you could understand?	2018	8.6	8.0
	2017	8.4	7.8
Q45. Did a member of staff tell you about medication side effects to watch for when you went home?	2018	7.2	5.2
	2017	6.6	5.1

Table 1: Comparison between Cappagh National Orthopaedic Hospital and national scores for Questions 44 and 45 of the National Patient Experience Survey 2017 and 2018.

Overall the results show that the Cappagh National Orthopaedic Hospital scored higher than the national average in responses received for both questions in 2017 and 2018. In response to these survey results, the hospital has worked to continually improve information provided to patients during their hospital journey and had developed an information booklet 'Know your Medicines' for orthopaedic patients following the 2017 National Patient Experience Survey .

Patient information

Cappagh National Orthopaedic Hospital had systems in place to provide information and education to patients on medication management. Inspectors were informed that counselling was provided by clinical pharmacists for patients commenced on oral anticoagulants. Counselling was also provided to patients in the acute rehabilitation unit which included an individual medication plan on discharge. Inspectors were informed that nursing staff also played an important role in providing education and support to patients on medication usage.

A clinical nurse specialist in pain management provided patient information and education as required. Education provided varied and was dependant on the type of patient and the circumstances. Topics covered related to analgesics and possible side effects that maybe experienced by individual patients.

Inspectors observed the availability of a number of patient information leaflets. For example, a patient information leaflet 'Pain Relief After Your Surgery' was available on the hospital website and provided to adult orthopaedic patients post operatively. The hospital had developed a patient handbook available in electronic and hard copy

formats which provided information relating to all aspects of the patient journey including medications management.

Inspectors were informed that the hospital was exploring different means of providing information to patients which included:

- the use of video
- interactive applications
- information sessions/presentations
- patient pocket cards on aspects of medication safety.

The hospital had also introduced initiatives for patients admitted to the acute rehabilitation unit aimed at reducing the risk of falls associated with medications. Multidisciplinary education sessions were provided for patients and a 'falls and bone health video' was due to be introduced in 2019.

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.^{27, 28,29}

Medication reconciliation was undertaken on admission by a clinical pharmacist. Similar to the previous HIQA inspection, all elective patients undergoing orthopaedic surgery received medication reconciliation by a clinical pharmacist using one source of information which was the patient. A more comprehensive medication reconciliation process using more verification sources was prioritised for patients admitted to the acute rehabilitation units including patients under 65 years. This process was monitored, and results demonstrated that an average 98% of patients admitted to these two units had received medication reconciliation on admission in 2018 and 27% of patients had discharge prescriptions checked by a pharmacist on discharge. Inspectors were informed that nursing staff performed a double check on all discharge prescriptions if a pharmacist was not available.

The hospital had identified extending enhanced medication reconciliation received by patients in the acute rehabilitation units to orthopaedic patients as one of the priorities within the Medication Safety Programme for 2019.

Systems to support medication safety and optimisation

Some systems were in place to support medication safety and optimisation in relation to the:

- prescribing and administration of crushed medications

- medication reconciliation on admission flagged medications associated with increased falls or drowsiness
- red allergy wrist bands.

There were two medication record forms designed to suit the short stay patients attending for planned surgery and the longer stay patients transferred from other acute hospitals who were admitted for rehabilitation care. Inspectors identified scope to improve the recording of patient weight measurements on the medication record to allow for multiple entries for patients in hospital for longer periods. Patient weight measurements are important for medications that require an individual weight-based dose.³⁰

Opportunities for improvement

- The hospital should continue its efforts to expand, enhance and standardise medication reconciliation to all inpatients.

2.5 Model of service and systems in place for medication safety

International studies support the role of clinical pharmacists^{§§§§} in hospital wards in preventing adverse drug events.^{31,32,33,34,35,36} Inspectors found that clinical pharmacy services were available to patients in all inpatient clinical areas.

The hospital had a list of medications approved for use in the hospital, also referred to as a formulary.^{*****} The purpose of maintaining this list is to ensure appropriate governance of medications approved for use within the hospital and that a safety evaluation occurs before new medications are introduced.³⁷ The hospital had a system in place for the approval of new medications which was under the governance of the Drugs and Therapeutic Committee. A regular review of the approved list of medications for use within the hospital was undertaken annually.

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.¹⁵

Inspectors found that locally approved medications information resources were available to staff on computer desk tops in clinical areas assessed. Medication information available included:

^{§§§§} Clinical pharmacy describes the activity of pharmacy teams in ward and clinic settings.

^{*****} Formulary: a managed list of preferred medications that have been approved by the hospital's Drugs and Therapeutics Committee for use at the hospital.

- Medicines Complete providing electronic up-to-date access to multiple recognised medication information sources
- locally adopted antimicrobial administration guidelines
- medication protocols for some but not all intravenous medications
- a suite of policy, procedures and guidelines to support medication safety.

Inspectors found that intravenous drug administration guidelines were not consistently available for staff in all areas assessed. Inspectors identified that there was very limited medication information available in the theatre department. Some printed monographs observed by inspectors were out-of-date and were not subject to document quality control. However, the inspection team was informed that a hospital intravenous drug administration policy was in the advanced stage of development and due to be formally approved in the near future.

The pharmacy department issued two medication safety newsletters to all clinical areas in 2018 which provided updates on medication safety related issues initiatives and audit results.

Inspectors were informed that there was a representative from each clinical area on the Medication Management Committee. Information relating to medication safety was disseminated to staff at handover by the clinical nurse manager.

Opportunities for improvement

- The hospital should ensure that standardised quality controlled intravenous drug administration guidelines should be made available at the point of care as a matter of priority following this inspection.

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.¹⁵ Audits related to medication safety were mainly conducted by pharmacy and some were carried out by nursing staff.

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

- quarterly high-risk medication audits
- 2018 nursing quality care metrics †††††³⁸ for each clinical area
- allergy status recording audits completed in 2017 and 2018
- antimicrobials point prevalence surveys completed in 2017 and 2018
- transfer documentation audits 2017 to 2018

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

- VTE prophylaxis post joint replacement surgery
- monthly monitoring of pharmacy key performance indicators including:
 - percentage of patients receiving medication reconciliation by a clinical pharmacist on admission and within 24 hours of admission
 - medication reconciliation intervention on admission by a clinical pharmacist
 - discharge prescriptions checked by a pharmacist
 - medication reconciliation interventions on discharge by a clinical pharmacist
 - medication planner provided to patients for planned discharges from the acute rehabilitation unit
 - number of patients counseled for high-risk medications
 - post-operative review of paediatric patients by a pharmacist

In general, audit results viewed by inspectors showed that high compliance was achieved. For example, the hospital achieved over 90% compliance in audits conducted in 2018 which assessed compliance with the hospital high alert medication policy. However, inspectors found that these audits were not conducted in the theatre department for that period. Audits demonstrating less than optimal compliance in 2018 were targeted as areas of improvement and prioritised within the medication safety programme and time bound quality improvement plan.

Opportunities for improvement

- The hospital should ensure that planned medication safety audits are inclusive of all clinical areas.

2.8 Education and training

Staff education can effectively augment error prevention when combined with other strategies that strengthen the medication-use system.³⁹

Cappagh National Orthopaedic Hospital had a medication safety education programme in place and staff education was a core objective of the annual medication safety programme. A variety of initiatives were used by the hospital to keep staff up-to-date and informed on issues relating to medication safety including:

- induction for clinical staff which included a variety of topics related to medication safety
- classroom based education sessions
- informal face-to-face ward based education sessions
- HSE LandD medication management module⁴⁰ e-learning programmes
- pharmacy presentations at the journal club and at clinical audit meetings

**** The health service elearning and development service

- circulation of information relating to changes in practices resulting from medication incidents which had occurred within the hospital
- training provided by the clinical nurse specialist in pain management on pumps used for the administration of analgesics via epidurals or patient controlled administration
- a one day study day provided by the high dependency unit on anticoagulant therapy in the peri-operative setting.

Training records viewed by inspectors showed a high compliance with attendance at training and education provided by the hospital. However, the hospital had identified that staff education on safe prescribing and drug administration practices was a focus of improvement and included in the quality improvement plan for 2019.

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.

Overall, Cappagh National Orthopaedic Hospital had established systems in place for high-risk medications which were relevant to the specialised services provided. The hospital had established governance arrangements in place for medication safety which were reviewed and strengthened since the last HIQA inspection in July 2017. A comprehensive time bound quality improvement plan was developed in response to the last HIQA announced medication safety inspection in 2017 with evidence of the implementation of associated quality improvement initiatives.

The hospital did not have a long term strategy for medication safety. However, inspectors saw evidence of the hospital's responsiveness to issues identified and information received relating to medication safety which were set out and progressed in the annual medication safety programme. Auditing and monitoring of medication safety was aligned to this medication safety programme and quality improvement plan. In addition, the hospital proactively monitored compliance with newly implemented policies relating to medication safety.

The hospital had proactively targeted the management of high-risk medications as a focus of improvement in 2018 which remains a hospital priority for 2019. Strategies viewed during the inspection showed that good practices were embedded in the provision of care to patients and there was good local ownership on issues relating to medication safety.

However, inspectors found opportunities for improvement in the management and quality control of some printed versions of medication information observed and in the provision of locally approved intravenous medication guidelines for all clinical areas. There was also some scope for improvement in the management and auditing of some high-risk medications.

The hospital should continue to work towards improving medication safety practices by addressing the findings of this report and progressing the implementation of initiatives identified through its own monitoring of practices in place.

This report should be shared with relevant staff at Cappagh National Orthopaedic Hospital and the Ireland East 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 require focus for leadership and management at the hospital to ensure that medication safety continues to be seen as a priority so that patients are protected from known and avoidable harm.

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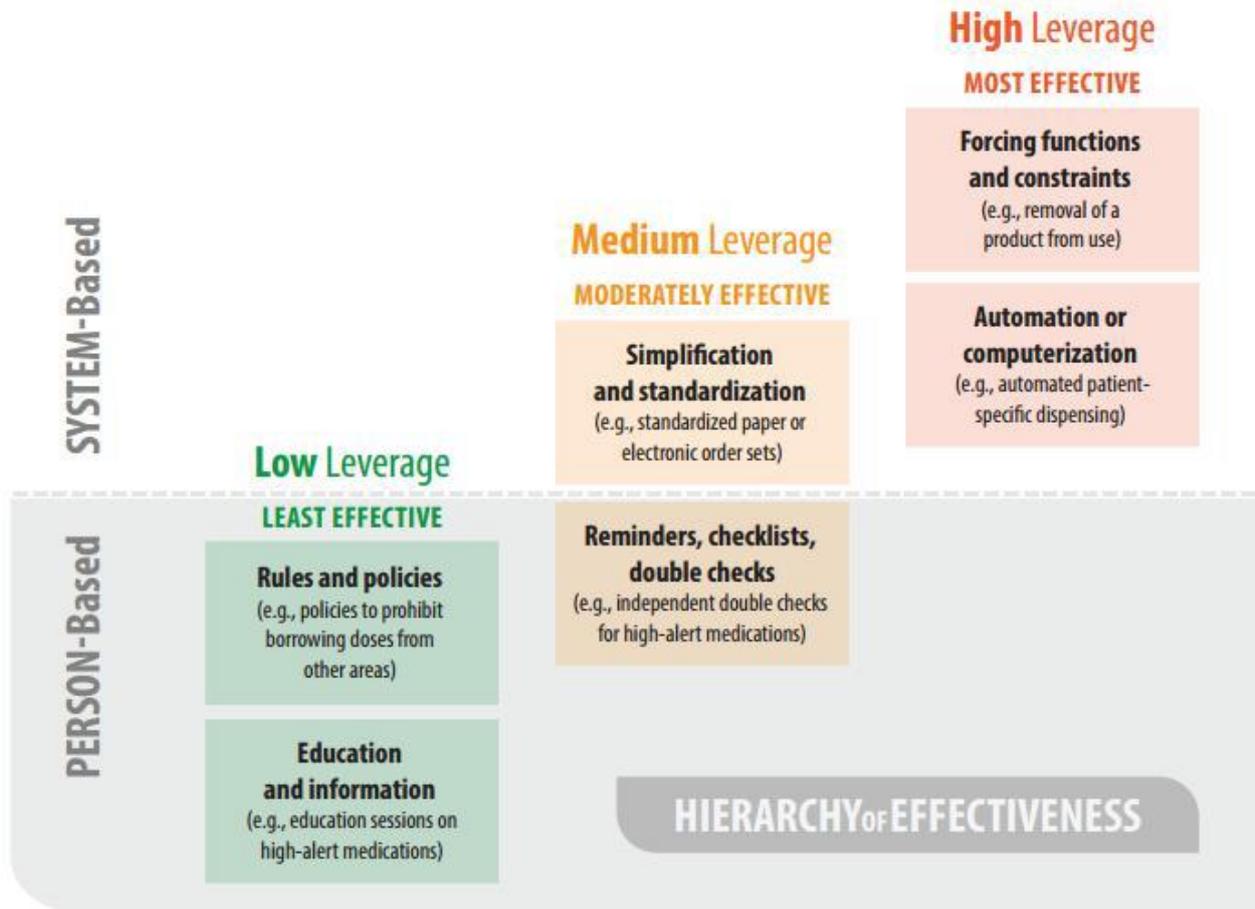
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5. Appendices

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

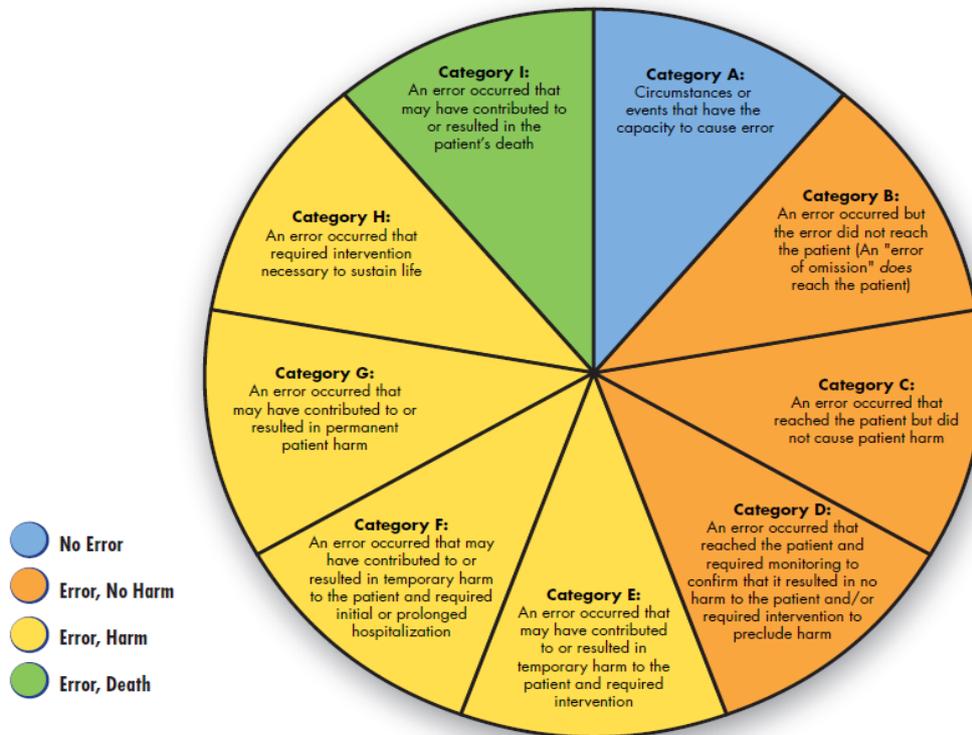
Area to be explored	Lines of enquiry	Dimensions/ Key Areas	National Standards
Leadership, governance and management	1. Patient safety is enhanced through an effective medication safety programme underpinned by formalised governance structures and clear accountability arrangements.	Capacity and capability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

Appendix 2: Hierarchy of effectiveness of risk-reduction strategies in medication safety.



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Appendix 3: National Coordinating Council for Medication Error Reporting and Prevention. Index for categorising medication errors.



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.)

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