



**Health
Information
and Quality
Authority**

An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

Report of the unannounced inspection at the Mater Misericordiae University Hospital, Dublin.

Monitoring programme undertaken against the National Standards for the prevention and control of healthcare-associated infections in acute healthcare services

Date of on-site inspection: 27 October 2017

About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is an independent authority established to drive high-quality and safe care for people using our health and social care services in Ireland. HIQA's role is to develop standards, inspect and review health and social care services and support informed decisions on how services are delivered.

HIQA aims to safeguard people and improve the safety and quality of health and social care services across its full range of functions.

HIQA's mandate to date extends across a specified 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 statutory responsibility for:

- **Setting Standards for Health and Social Services** — Developing person-centred standards, based on evidence and best international practice, for health and social care services in Ireland.
- **Regulation** — Registering and inspecting designated centres.
- **Monitoring Children's Services** — Monitoring and inspecting children's social services.
- **Monitoring Healthcare Safety and Quality** — Monitoring the safety and quality of health services and investigating as necessary serious concerns about the health and welfare of people who use these services.
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1. Introduction

HIQA monitors the implementation of the *National Standards for the prevention and control of healthcare-associated infections in acute healthcare services*¹ in public acute hospitals in Ireland to determine if hospitals have effective arrangements in place to protect patients from acquiring healthcare-associated infection. The *National Standards for the prevention and control of healthcare-associated infections in acute healthcare services* will be referred to as the National Standards in this report.

In 2017, HIQA commenced a revised monitoring programme against the National Standards. The aim of this revised monitoring programme is to assess aspects of the governance, management and implementation of designated programmes to prevent and control healthcare-associated infections in hospitals. This monitoring programme comprises Phases One, Two and Three which will be described next.

The National Standards were updated in 2017 and therefore supersede the previous version. Hospitals should work towards implementing these revised National Standards.

Phase One

All public acute hospitals were requested to complete and return a self-assessment tool to HIQA during April and May 2017. The self-assessment tool comprised specific questions in relation to the:

- hospital infection prevention and control programme and associated oversight arrangements
- training of hospital personnel to implement policies, procedures, protocols, guidelines and evidence-based practice in relation to the prevention and control of infection
- the systems in place to detect, prevent, and respond to healthcare-associated infections and multidrug-resistant organisms.

The hospital Chief Executive Officer or General Manager and the Health Service Executive (HSE) Hospital Group Chief Executive Officer were asked to verify that the information provided to HIQA accurately reflected the infection prevention arrangements within the hospital at that time.

Phase Two

Using a revised assessment methodology HIQA commenced a programme of unannounced inspections against the National Standards in public acute hospitals in May 2017.

Specific lines of enquiry were developed to facilitate monitoring in order to validate some aspects of self-assessment tools submitted by individual hospitals. The lines of enquiry which are aligned to the National Standards are included in this report in Appendix 1.

Further information can be found in the *Guide to the monitoring programme undertaken against the National Standards for the prevention and control of healthcare-associated infections*² which was published in May 2017 and is available on HIQA's website: www.hiqa.ie

Phase Three

Phase Three of this monitoring programme will focus on the reprocessing of reusable invasive medical devices and HIQA will commence onsite inspections in this regard in 2018.

Information about this inspection

This inspection report was completed following an unannounced inspection carried out at the Mater Misericordiae University Hospital by Authorised Persons from HIQA; Aileen O' Brien, Noreen Flannelly-Kinsella, Emma Cooke and John Tuffy. The inspection was carried out on 27 October 2017 between 09:10hrs and 17:40hrs.

Prior to this inspection, authorised persons reviewed the hospital's completed self-assessment tool and related documentation submitted to HIQA earlier in May 2017.

During this inspection inspectors spoke with hospital managers and staff, and members of the Infection Prevention and Control Team. Inspectors requested and reviewed documentation and data and observed practice within the clinical environment in a small sample of clinical areas which included:

- A surgical ward
- The Renal Dialysis Unit

Inspectors also visited an area where cleaning textiles were laundered.

Inspection findings presented in this report are aligned to HIQA's monitoring lines of enquiry as shown in Appendix 1. The inspection team used specifically designed monitoring tools during this inspection in relation to aspects of:

- Prevention of invasive device-related infection (Section 2.5.1)
- Preventing the spread of antimicrobial-resistant bacteria (Section 2.6.1)
- Safe injection practice (Section 2.6.2)

HIQA would like to acknowledge the cooperation of the hospital management team and all staff who facilitated and contributed to this unannounced inspection.

2. Findings at the Mater Misericordiae University Hospital

The following sections 2.1 to 2.8 present the general findings of this unannounced inspection which are aligned to monitoring lines of enquiry.

2.1 Governance

Line of enquiry 1.1

The hospital has formalised governance arrangements with clear lines of accountability and responsibility around the prevention and control of healthcare-associated infections.

Governance arrangements

The Mater Misericordiae University Hospital is a voluntary public acute hospital which is both a university teaching and tertiary referral hospital and is part of the Ireland East Hospital Group.

Inspectors found that there were clear lines of accountability and responsibility in relation to governance and management arrangements for the prevention and control of healthcare-associated infection at the hospital. The Chief Executive Officer was accountable for overall management and monitoring of the prevention and control of healthcare-associated infection at the hospital and reported to the hospital board. In addition, the Chief Executive Officer reported to the Ireland East Hospital Group Chief Executive Officer under the Health Service Executive (HSE) accountability framework.

The Infection Prevention and Control Team at the hospital was led by a designated consultant microbiologist and comprised specialist and multi-disciplinary staff who reported upward to two Infection Prevention and Control Committees, entitled the Direct Infection Prevention and Control Committee and the Indirect Infection Prevention and Control Committee. Governance arrangements in respect of the prevention and control of healthcare-associated infection had been reviewed in late 2016 at which time hospital management had restructured the infection prevention and control committee into two committees.

The Direct Infection Prevention and Control Committee was established to oversee the implementation of clinical aspects of the infection prevention and control programme, to support implementation of National Standards and to monitor healthcare-associated infection rates, local alert organism trends and outbreaks, related performance indicators and oversight of reciprocal action plans.

The Indirect Infection Prevention and Control Committee was established to oversee non-clinical aspects of the infection prevention and control programme and to support implementation of National Standards. This committee also functioned as an environmental monitoring committee with oversight of aspects of water-borne infection prevention, aspergillosis prevention during upgrade and building works in addition to occupational health.

An organisational diagram reviewed by inspectors showed that both of the Infection Prevention and Control Committee's reported directly to the Chief Executive Officer. In addition there were lines of communication between the two infection prevention and control committees and other hospital committees including the Health and Safety Committee, the Patient Safety and Risk Management Committee and the Drugs and Therapeutics Committee which included antimicrobial stewardship.

A governance organisational diagram also indicated that the Decontamination Committee and the Hygiene Committee reported to the Indirect Infection Prevention and Control Committee and that the Sepsis Committee reported to the Direct Infection Prevention and Control Committee.

Both infection prevention and control committees were scheduled to meet four times a year on the same day and had terms of reference and defined membership. Terms of reference did not describe how these committees would formally report upwards to executive management or how other committees as mentioned would formally report into the Infection Prevention and Control Committees.

Both committees were co chaired by the Chief Executive Officer and the Executive Clinical Director and were accountable to the Chief Executive Officer. Membership of both committees was multi-disciplinary with representation appropriate to individual committee functions and also included representation from the hospital's quality and risk structures. Minutes of committee meetings did not reflect surgical and medical representation at the Direct Infection Prevention and Control Committee as described in committee terms of reference.

The Microbiology Department in the hospital was accredited by the Irish National Accreditation Board.

Infection prevention and control service

The Infection prevention and control service was delivered by a multidisciplinary infection prevention and control team which included the following:

- three consultant microbiologists one of whom was the clinical lead for infection prevention and control

- five whole time equivalent (WTE)* infection prevention and control nurses, which included an assistant director of nursing, two clinical nurse specialists and two clinical nurse managers
- 0.25 WTE surveillance scientist
- 1.5 WTE antimicrobial pharmacists
- a senior medical scientist
- one specialist registrar in microbiology
- one registrar in microbiology.

Three nurses on the team had completed post-graduate training in this speciality, one nurse had commenced this training in 2017 and another nurse was scheduled to undertake this training in 2018.

The team had identified to hospital management the need for additional resources to progress surgical site infection surveillance, multidrug-resistant organism screening and rapid testing for norovirus and influenza at the hospital.

The aim of the Infection Prevention and Control Team was to prevent, reduce and control healthcare-associated infection by means of an effective infection prevention and control programme. The team's workload was described in the Infection Prevention and Control Team annual report 2016 and included infection surveillance and outbreak management, provision of advice, communication with staff, risk identification, delivery of education and review of policies, procedures and guidelines. In addition to day to day liaison the team met formally once a month. The team also produced an annual infection prevention and control plan.

The Infection Prevention and Control Team also provided telephone advice to Fairview Community Nursing Unit and St Paul's Community Services and other community-based stakeholders. The team was represented on the Infection Prevention and Control Committees, Patient Safety and Risk Committee, Health and Safety Committee, Hygiene Services Forum, Decontamination Committee and the Nursing Executive Committee. In addition, the team was also represented by a consultant microbiologist on the Quality and Patient Safety Steering Group.

Advice was also provided in respect of construction and renovation activities with infection prevention and control implications. Referrals to infection prevention and control nurses, advice provided and visits to clinical areas were recorded electronically.

The team was also involved in the development of policies and staff training and procurement of specialist personal protective equipment in relation to the

* Whole-time equivalent (WTE): allows part-time workers' working hours to be standardised against those working full-time. For example, the standardised figure is 1.0, which refers to a full-time worker. 0.5 refers to an employee that works half full-time hours.

management of patients with viral haemorrhagic fevers and other very high risk infectious diseases as the National Isolation Unit was located in the Mater Misericordiae University Hospital.

The team was supported by the Microbiology Department. Consultant microbiologist advice was available to clinical staff twenty-four hours a day, seven-days-a-week. This was provided on a rotational basis by the three consultant microbiologists, who also had commitments in the Mater Private Hospital and Cappagh National Orthopaedic Hospital.

Monitoring and evaluation

The hospital monitored and reported the following performance indicators in relation to the prevention and control of healthcare-associated infection in line with HSE national reporting requirements:

- percentage compliance of hospital staff with the World Health Organisation's five moments of hand hygiene using the national hand hygiene auditing tool
- rate of new cases of hospital-acquired *Clostridium difficile* infection
- rate of new cases of hospital-acquired *Staphylococcus aureus* bloodstream infection.

Data in relation to these indicators was presented at meetings of the Direct Infection Prevention and Control Committee and the Quality and Patient Safety Steering Committee and was reported monthly to the Executive Management Committee, Ireland East Hospital Group and to the HSE.

The hospital group performance report also included the:

- rate of inpatient norovirus infection.

The following surveillance data was sent monthly to the Mater Misericordiae University Hospital Board:

- hospital-acquired *Clostridium difficile* infection
- vancomycin-resistant enterococci (VRE) and *Staphylococcus aureus* identified in blood cultures
- number of hospital inpatients positive for norovirus.

A number of other parameters relating to the prevention and control of healthcare-associated infection were regularly monitored by the Infection Prevention and Control Team and these included the following:

- twice daily 'alert' organism surveillance

- 'alert' condition[†] surveillance
- clusters or outbreaks of infection
- data reported to the European Antimicrobial Resistant Surveillance Network (EARS-Net)[‡]
- carbapenemase-producing enterobacteriaceae (CPE) surveillance and meropenem usage and total number of screening samples
- meticillin-resistant *Staphylococcus aureus* (MRSA) surveillance
- vancomycin-resistant enterococci surveillance
- antimicrobial usage
- *mycobacterium chimaera*
- extended spectrum beta lactamase-resistant organism surveillance
- peripheral vascular catheter care bundle implementation
- hospital-acquired influenza rate
- local hand hygiene audit results
- hand hygiene facilities
- staff hand hygiene education compliance
- surgical site infection surveillance
- hygiene and environmental audit result trends
- influenza vaccine uptake by staff
- compliance with sepsis identification and management protocols
- usage of hydrogen peroxide decontamination.

The team also monitored outcome measures in patients with multidrug-resistant organisms by quantifying the number of patients with clinical infection due to these organisms and the number of these infections that may have been hospital-acquired. This information was presented and discussed at meetings of the infection prevention and control committees.

The hospital had participated in a national point prevalence survey of hospital-acquired infections and antimicrobial use in May 2017 which was part of a European-wide point prevalence study.

The team also provided oversight of water test results for legionella bacteria. Hand hygiene facilities had been audited in 2017. Data in respect of the parameters monitored, legionella water test results and audit findings were presented at meetings of the Infection Prevention and Control Committees and to the Chief Executive Officer as co-chairperson of both committees. A mattress audit was

[†] Alert conditions include physical symptoms such as skin rashes, vomiting, diarrhoea, respiratory illness that could be due to an infectious illness

[‡] EARS-Net performs surveillance of antimicrobial susceptibility of bacteria causing infections in humans including; *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Acinetobacter* species, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Enterococcus faecalis* and *Enterococcus faecium*.

performed in 2015. An independent mattress audit was scheduled for November 2017. Inspectors were informed following the inspection that this had taken place.

Detailed analyses were performed in respect of cases of healthcare-associated cases of *Staphylococcus aureus* bloodstream infection by a consultant microbiologist and of two or more cases of *Clostridium difficile* infection by the Infection Prevention and Control Team.

An annual infection prevention and control report was produced by the Infection Prevention and Control Team which included data in relation to the parameters monitored by the team.

There was ongoing monitoring of environmental hygiene at the hospital whereby managers in clinical areas and departments were required to complete monthly audits, results of which were overseen by hospital management. Documentation reviewed showed that some areas did not always submit audit reports each month to management. Hygiene audit results were presented by directorate and by clinical area or department. Aggregate data as provided to inspectors did not facilitate oversight of the standard of patient equipment hygiene.

Quality and safety walk-rounds were undertaken by the Executive Management Team at the hospital and these involved meeting staff, and identifying examples of good practice and areas for improvement which included hospital hygiene and facilities.

Inspectors were informed of plans to establish an Ireland East Hospital Group healthcare-associated infection and antimicrobial resistance committee. One initial meeting had been held to discuss this.

2.2 Risk management

Line of enquiry 1.2

Risks in relation to the prevention and control of infection are identified and managed.

Risks in relation to the prevention and control of infection should be identified and effectively mitigated or managed. Any gaps or serious risks identified in the service's ability to prevent and control healthcare-associated infections must be addressed in a timely manner.

Inspectors reviewed the corporate risk register for the hospital. Documentation provided showed that hospital management had identified one high risk which could impact on the prevention and control of healthcare-associated infection at the hospital which was overcrowding in the Emergency Department. Additional control measures were in place to address this risk and to improve patient flow at the hospital. The hospital had an isolation protocol for patients in the Emergency Department and patients were assessed upon presentation to find the most appropriate accommodation location.

Clinical incident data was discussed at the hospital Quality and Patient Safety Steering Committee. However, incidents in relation to the prevention and control of healthcare-associated infection did not appear to be quantified or trended. Recording of such incidents is good practice and this information should be used to identify risks and to identify opportunities for improvement. There was a designated group within the hospital governance structure for oversight of serious incidents.

Hospital management had plans to increase inpatient bed capacity and single room facilities at the hospital. In addition, there were plans to create an additional consultant microbiologist position. Laboratory infrastructure at the hospital required upgrade.

The annual infection prevention and control plan for 2017 included the development of a local infection prevention and control risk register; this did not appear to have been progressed at the time of inspection. In line with National Standards, infection prevention and control programme activities should include regular service-wide risk assessment. In addition, there should be regular review of the infection prevention and control programme to evaluate its ongoing effectiveness, and determine any gaps that could affect the safe delivery of care. The review should include full consideration of the scale and complexity of services provided, hospital activity levels and the resources required to deliver the infection prevention and control service. There should be prioritisation of actions to mitigate risks to the service.

2.3 Policies, procedures and guidelines

Line of enquiry 2

The hospital has policies, procedures and guidelines in relation to the prevention and control of infection and hospital hygiene.

Current HSE policy states that hospital policies, procedures and guidelines should be reviewed every three years.³ At the time of this inspection, a number of infection control policies and some invasive device-related management policies were due for review. It was practice that hospital policies, procedures and guidelines in respect of infection prevention and control were ratified by a consultant microbiologist and through the infection prevention and control committee structure.

Hospital policies, procedures and guidelines were made available to staff in electronic format on the hospital intranet. The hospital had an infection prevention and control hardcopy manual in place which staff used to access some infection prevention and control information and guidelines. This comprised sections which covered aspects of standard precautions, transmission-based precautions and aseptic non-touch technique. Inspectors were informed that staff sometimes experienced difficulty in accessing infection prevention and control information in a timely manner due to the format of the manual. Inspectors noted that the manual had been approved in 2005. It was reported that a review of this manual was underway and that individual infection prevention and control-related policies would be produced to facilitate ease of access for staff. A number of individual infection prevention and control policies had been developed and these included hand hygiene, outbreak management, an interim Carbapenemase-Producing *Enterobacteriaceae*[§] policy, a peripheral vascular catheter care plan and care bundle and a water flushing policy. The Infection Prevention and Control Team had also recently developed an isolation prioritisation policy to guide staff when making arrangements to accommodate patients with potentially transmissible infection.

In 2016, the Infection Prevention and Control Team in collaboration with the Infectious Disease Consultants developed a pathway for any suspected and or confirmed cases of Ebola Virus Disease as the National Isolation Unit was located at the hospital. A protocol for correct application and removal of personal protective

[§] Carbapenemase-producing Enterobacteriaceae (CPE), are a family of bacteria which can cause infections, that are difficult to treat because they are resistant to most antimicrobials, including a class of antimicrobials called carbapenems which have typically been used as a reliable last line treatment option for serious infection. Bloodstream infection with CPE has resulted in patient death in 50% of cases in some published studies internationally.

equipment was also developed in collaboration with the Infectious Disease Consultants to be implemented during the care of highly infectious patients.

The Infection Prevention and Control Team annual plan for 2017 included the development of a strategy regarding infection prevention and control team involvement in planning for renovation and construction work. National guidelines were used at the hospital in relation to the prevention and control of healthcare-associated infection. It is recommended that national guidelines which have been formally adapted as local policies should be clearly identifiable as mandated Mater Misericordiae University Hospital policies that include approval and review dates.

It was noted that staff in the clinical areas inspected had some difficulty accessing policies, procedures and guidelines stored electronically in a timely manner. Access to and organisation and labelling of documents in the hospital's electronic document management system could be refined and improved so as to facilitate easy access in a timely manner to the most up-to-date hospital policies, procedures and guidelines by staff.

At the time of inspection the hospital did not have a policy in relation to ventilator-associated pneumonia or surgical site infection prevention, other than surgical antimicrobial prophylaxis guidelines.

2.4 Staff training and education

Line of enquiry 3

Hospital personnel are trained in relation to the prevention and control of healthcare-associated infections.

The Mater Misericordiae University Hospital had implemented a number of different measures to promote education and training of clinical staff which demonstrated a commitment to promoting safer patient care.

Documentation provided by the hospital showed that hand hygiene training was mandatory for staff at induction and thereafter every two years which was in line with the nationally recommended frequency of training every two years.⁴ Staff at the hospital were required to undertake hand hygiene education theory every two years and clinical staff also undertook hand hygiene practical assessments annually. Electronic training options were also available to staff. Hand hygiene training sessions were delivered by the Infection Prevention and Control Team at scheduled intervals. Practical hand hygiene assessments were facilitated in clinical areas.

During 2016, training in the use of personal protective equipment was provided to relevant staff at the hospital. A 'train the trainer' programme was developed for designated staff to deliver this training to colleagues. As the National Isolation Unit was located at the hospital additional training in the use of personal protective equipment was provided to staff who could be assigned to this unit. Refresher and enhanced training was also provided to a number of staff in 2016.

Inspectors reviewed training records for relevant staff across the hospital and staff in the clinical areas inspected. At the time of the inspection, 77% of hospital staff had attended hand hygiene training in the previous two years.

Infection prevention and control training was provided at induction for new staff. Infection prevention and control training and or education incorporated standard precautions (including hand hygiene) and transmission-based precautions. Separate hand hygiene theory and practical training was also provided.

This training and education was also provided to medical students and hospital staff, and infection prevention and control nurses also provided training and education to clinical area and departmental staff on request. Education in relation to hand hygiene and standard precautions was provided during mandatory study days for nurses. Inspectors were informed that there was no regular schedule or attendance requirements in relation to infection prevention and control education for staff other than hand hygiene training requirements. This needs to be reviewed and expanded

in line with national guidance for such knowledge and skills, which includes training in relation to standard and transmission-based precautions, and aseptic non-touch technique.⁵ All staff in the surgical ward and in the Renal Dialysis Unit inspected were up-to-date with hand hygiene training at the time of inspection.

Members of the Infection Prevention and Control Team provided infection prevention and control education to medical staff at induction. Infection prevention and control education was also provided by the team to nursing students in their first, third and fourth academic year and to final year medical students prior to clinical placements at the hospital.

Staff stated that clinical microbiology and infection prevention and control advice was available as required.

2.5 Implementation of evidence-based and best practice

Line of enquiry 4.1

The hospital has implemented evidence-based best practice to prevent intravascular device-related infection and urinary catheter-associated infection, ventilator-associated pneumonia and surgical site infection.

2.5.1 Prevention of invasive device-related infection

Care bundles to reduce the risk of different types of infection have been introduced across many health services over the past number of years, and there have been a number of guidelines published in recent years recommending their introduction across the Irish health system.^{6,7,8} The implementation of care bundles to prevent invasive device-related infection was reviewed in both of the clinical areas inspected.

The Infection Prevention and Control Team had led on the implementation of a peripheral vascular care plan and care bundle at the hospital. Inspectors were informed that implementation of this care bundle had reduced the incidence of peripheral vascular catheter-related infection in 2016. Documentation reviewed showed that the team had also completed an audit and had identified the need to standardise the storage of supplies for peripheral vascular catheters in clinical areas.

Catheter-related bloodstream infection surveillance was performed among patients receiving parenteral nutrition at the hospital. As a result of surveillance findings, the Infection Prevention and Control Team had recommended continuing the practice of administering parenteral nutrition through a dedicated catheter port.

Surgical Ward

Inspectors were informed that peripheral vascular catheter care bundles had recently been implemented in most areas in the hospital. Care bundles in relation to urinary catheters, central vascular catheters and peripherally inserted central catheters were not in place in the hospital. Inspectors were informed that urinary catheter care bundles were being piloted in a sample of wards including the surgical ward inspected.

Monitoring compliance with care bundles is an important process measure for evaluation of catheter-related blood stream infection preventative programmes. Monthly compliance with peripheral vascular catheter care bundle implementation was audited in the surgical ward and results showed 80% compliance with the care bundle in March 2017. This result indicates that not all care bundle elements were consistently implemented by staff and that improvement is required.

The implementation of care bundles needs to be progressed at the hospital.

Renal Dialysis Unit

Inspectors looked at aspects of the prevention of invasive device-related infection in the Renal Dialysis Unit.

Care bundles for central venous catheters were not in use in the Renal Dialysis Unit. Staff in the unit were planning to implement care bundles for the care of patients with an arteriovenous fistula.** Inspectors were informed that prospective surveillance of catheter-related bloodstream infection was not performed in the unit, however, there was twice yearly look back of patient's records and blood culture results to determine the number of device-related infections. This information was fed back to staff in the unit. Detailed analyses were performed in respect of any identified cases of *Staphylococcus aureus* bacteraemia. Inspectors were informed that *Staphylococcus aureus* and VRE blood stream infections were reviewed monthly throughout the hospital by a consultant microbiologist.

2.5.2 Surveillance of surgical site infection

Surgical site infection represents one of the most common categories of healthcare-associated infections. Surveillance with feedback and implementation of quality improvement initiatives have been shown to be an important element in reducing the incidence of surgical site infection.^{9,10,11}

Inspectors were informed that surgical site infection surveillance was performed at the hospital in respect of cardiac surgery. Surveillance data was collected manually by the Infection Prevention and Control Team in line with international surgical site infection surveillance definitions. Results were reported to the surgical team and to the Direct Infection Prevention and Control Committee. Discussion with staff and review of documentation showed that retrospective review of possible causes and patient risk factors was performed if the rate of infection was greater than expected. Inspectors were informed that the latest surgical site infection surveillance results were scheduled for discussion at the November meeting of the Direct Infection Prevention and Control Committee.

Surveillance of surgical site infection is a valuable activity when the information generated is fed back to relevant clinical staff in a timely manner and where there is staff engagement to constructively identify upward trends and implement preventative measures. Surveillance findings should be used to inform local surgical site infection prevention policies and practice. Use of standardised surveillance

** A surgically created connection between an artery and a vein which is used to provide vascular access for longer term renal dialysis.

methodology can facilitate comparison of infection rates with data from other hospitals. Electronic options to reduce the burden of manual data collection should be explored at the hospital.

Surgical site infection surveillance was also performed at the hospital by the Infection Prevention and Control Team in respect of spinal surgery. Results were reported to the surgical team. Surgical prophylaxis guidelines for this patient cohort had been recently revised at the hospital.

2.6 Systems to prevent and manage healthcare-associated infections and multidrug-resistant organisms

Line of enquiry 4.2

The hospital has systems in place to detect, prevent, and respond to healthcare-associated infections and multidrug-resistant organisms in line with national guidelines.

2.6.1 Preventing the spread of antimicrobial-resistant organisms

Inspectors looked at implementation of aspects of transmission-based precautions and measures to prevent the spread of antimicrobial-resistant organisms to patients.

All patients identified with a multidrug-resistant organism were identified on the hospital electronic patient management system which provided a prompt to staff to review the patients details on a 'nursing specialist's referral system'. This system provided relevant information in relation to screening results and required infection prevention and control measures. Where patients were identified with a specific transmissible organism, patient information leaflets were placed in the healthcare record to support the provision of information and support to patients. The Infection Prevention and Control Team provided advice in relation to control measures.

It was reported that screening of patients for colonisation or infection was largely performed in line with national guidelines but that MRSA and CPE screening needed to be expanded to fully implement national screening guidelines.^{12,13} A gap analysis had been performed by the Infection Prevention and Control Team and a need for additional resources to expand this screening was identified.

Hospital isolation facilities

There were 630 hospital beds (inclusive of day beds) at the Mater Misericordiae University Hospital of which 592 of the 594 funded beds were occupied on the day of inspection.

The hospital had 185 single rooms of which 152 had ensuite toilet facilities as recommended which is beneficial from an infection prevention and control perspective. The hospital had 50 purpose built single isolation rooms with specialised ventilation which were located in two hospital wards and five critical area areas.

On the day of inspection, isolation precautions were indicated for 67 patients and of these 59 patients were accommodated in single rooms. Eight patients for whom isolation precautions were indicated were not accommodated in single rooms.

Communication with staff

Documentation reviewed showed that there was regular formal communication to staff in relation to evolving screening requirements and infection prevention and control precautions for CPE at the hospital. Communication was also circulated to staff in relation to implementation of a new hospital policy to guide the prioritisation of patients for isolation. It was practice to highlight patients with known infection risk in the hospital's electronic information system in order to identify accommodation needs and microbiological screening requirements.

Surgical ward

The surgical ward could accommodate 31 patients and patient accommodation comprised five single rooms, one two-bedded room and four six-bedded rooms. Only three single rooms had en-suite facilities and clinical hand wash sinks for staff. On the day of inspection five patients required transmission-based precautions and four of these patients were appropriately accommodated in single rooms. One patient, for whom transmission-based precautions were indicated, was accommodated in a multi-occupancy room with patients without transmissible infection and these precautions had not been implemented. Other opportunities for improvement were identified in that doors to some isolation rooms were open and signage to alert staff or visitors to the required precautions were not consistently applied. Isolation room doors should be kept closed as far as possible, otherwise a risk assessment should be performed.

Ward staff informed inspectors that patient assessment in relation to transmissible infections was performed in the Emergency Department and on admission to clinical areas at the hospital. Nursing documentation reviewed showed an infection status section and a prompt in relation to screening. Inspectors were informed that screening in relation to CPE was performed on advice from the Infection Prevention and Control Team.

On the day of inspection, deficiencies in relation to patient equipment hygiene and environmental hygiene were identified. Some patient equipment items were unclean. Brown staining was observed on three commodes inspected. This was addressed at the time of inspection. Inspectors were informed that designated blood pressure cuffs were not assigned to isolated patients and cleaning of blood pressure cuffs only occurred after use on isolated patients. Such items should be cleaned between patients in line with national guidelines. A sign on a bedpan washer recommended manual emptying of bedpans prior to placement in the machine. This is not recommended practice and requires review.

Inspectors also identified poor practice in relation to the hygienic management of patient equipment items stored in an ancillary room which was accessed through a

staff rest room. Environmental surfaces and patient equipment items including armchairs and a wheelchair were unclean. A household cleaning cart and a number of mattresses due for disposal were stored inappropriately in this room. Occurrence of such issues should be identified and addressed through local hygiene monitoring processes.

Inspectors found that the frequency of patient equipment cleaning in the surgical ward was not in line with recommended national minimum cleaning frequencies for higher risk areas. Additionally, it was reported to inspectors that staff responsible for cleaning patient equipment were not always allocated time to perform weekly cleaning schedules due to competing demands on the ward. Some checklists reviewed showed that the same duties were assigned to both household cleaning staff and healthcare assistants. There should be clearly defined responsibility for cleaning tasks.

Inspectors observed deficiencies in respect of environmental cleaning upon inspection of a bed space that was reported to have been cleaned. Red stains were present on a bedside locker and a bedside chair and stains were observed on bedside curtains. These issues were addressed at time of the inspection.

The daily housekeeping resource allocated to this ward as described to inspectors did not appear to be sufficient to clean this high risk area in line with national recommended cleaning frequencies. Environmental and patient equipment hygiene audits were performed monthly in the surgical ward and the most recent audits showed over 90% compliance with desirable standards from June to August 2017. This high level of compliance was not evident on the day of inspection.

Renal Dialysis Unit hygiene

Overall patient equipment and environmental surfaces within patient zones in the Renal Dialysis Unit were visibly clean with few exceptions. Two sharps containers had red stains. Black stains were visible on a wall adjacent to one dialysis station. Surfaces within or near dialysis stations should be regularly checked and spot cleaned as required.

Multiple small containers and blankets were located on the floor behind dialysis stations in one part of the main dialysis unit; some of these containers were stained and malodorous. Staff explained that there was some leakage of dialysis waste fluid at a small number of dialysis stations and that these containers were in place to contain leaked fluid. Hospital management was aware of this problem and were in the process of implementing service upgrade works to address the issue. It is recommended that this situation is reassessed by the Infection Prevention and Control Team and any additional measures required to reduce potential infection risks should be implemented. Alternative arrangements should be put in place for

scheduling treatment cycles at times when essential upgrade or repair works need to be performed.

Monthly hygiene audits were performed in the unit and audit reports included corrective actions required. The latest hygiene audit result for the unit was 73% in September 2017. Infrastructure and maintenance deficiencies in the Renal Dialysis Unit were highlighted to management in these monthly reports.

Renal Dialysis Unit infrastructure and design

The Renal Dialysis Unit comprised nineteen dialysis stations, the largest part of the dialysis unit was made up of two open plan treatment areas with eight dialysis stations in one area and six dialysis stations in the second area, there was a single room located in one of these areas. An additional four dialysis stations were located off the public corridor just outside the main unit, two of these were in single rooms and a further two dialysis stations were located in another room. One of these single rooms had ensuite facilities and a designated anteroom.

Some improvements had been made to the unit more recently. A new spacious waiting room had been provided for patients attending the unit, and surfaces and services in one part of the open plan treatment space had been upgraded. Water treatment and dialysis fluid production services in the unit had also been upgraded. However, the overall infrastructure of the Renal Dialysis Unit was outdated and was not in line with desirable modern standards for such units.

The unit was not self-contained and the two main treatment areas were separated from ancillary facilities and other treatment rooms by a public corridor.

Basic ancillary facilities were either absent or poorly configured. A 'dirty' utility room, two patient toilets and two rooms used for storage were located in one room accessed by a single door on the opposite side of the corridor outside the unit. The 'dirty' utility room did not have a door and partitioning between some of these functional areas did not extend to the ceiling. This meant that the 'dirty' utility room and a patient toilet were not physically separated. Toilet facilities for patients were kept locked for local operational reasons; keys were accessible to patients in the unit. This area also contained a room for temporary storage of waste however; this room also contained clean supplies. Facilities, equipment and resources required to safely and hygienically manage waste generated in the Renal Dialysis Unit should be reviewed.

Spatial separation around dialysis stations located within the larger treatment areas was limited and less than ideal. Surfaces and finishes in many parts of the unit did not facilitate effective cleaning and maintenance and were less than ideal for a high risk clinical area.

Storage facilities were insufficient in the Renal Dialysis Unit. Because of limited space in the unit there were no designated storage areas for patient's personal effects so these were stored on the floor next to dialysis beds. There was very little designated storage space for equipment and sterile supplies. Clean linen was stored uncovered on open shelves in the two main treatment areas. One single room that was used to isolate patients with transmissible microorganisms did not have an anteroom and therefore opened directly into the main treatment area. Patient equipment including extra dialysis chairs was stored along the public corridor outside the unit. Large mobile containers for collection of healthcare risk waste, household waste and laundry were stored directly next to these dialysis chairs. Patient equipment that is not in use should be cleaned and stored in a designated equipment storage area. Clean supplies should be stored in an appropriate storeroom.

It was reported that the hospital had plans to create a separate renal dialysis facility adjacent to the inpatient renal ward to provide a renal dialysis service for hospital inpatients. There were no defined plans to align the renal dialysis unit to current recommended guidelines for such facilities. It is recommended that plans to bring the Renal Dialysis Unit infrastructure into line with international best practice guidelines for renal dialysis units are developed at the hospital.¹⁴

At the time of inspection there were two dialysis machines running in each of three occupied dialysis stations. It was reported that it was practice to heat up a dialysis machine in anticipation of use by the next patient while the current patient was on dialysis on another machine, meaning that there were two machines at an occupied dialysis station. The operational norm in modern dialysis units is that dialysis machines are prepared for patients in a designated area other than an occupied dialysis station. It is recommended that this practice is reviewed due to the risk of dialysis machine contamination. Only those supplies and equipment needed for an individual treatment cycle should be brought to the dialysis station.

Central location for laundering cleaning textiles

Inspectors visited a central location for laundering textiles such as cloths and mop heads used for cleaning at the hospital. There was a failure to separate clean and dirty activities in this area which posed a risk of contamination of clean textiles. Clean textiles were stored on an open trolley on a corridor beside the laundering room. The corridor was used by staff to gain entry to a staff room and also by staff returning used cloths for laundering. Appropriate personal protective equipment was not worn by any of the staff handling unclean textiles in this area. Multiple surfaces and equipment in the reprocessing room were either dusty or unclean. Cleaning textiles should be laundered in a facility that meets hospital laundry specifications and guidelines. Appropriate supervision and management arrangements should be in place.

2.6.2 Safe injection practice

Inspectors looked at implementation of aspects of standard precautions to assess safe injection practice in the clinical areas inspected. Staff who spoke with inspectors in the clinical areas inspected were able to describe recommended safe injection practices.

Surgical Ward

Inspectors reviewed elements of safe injection practice and implementation of aspects of standard precautions in the clinical area inspected. Staff were able to describe recommended safe injection practices in this ward.

Medication for injection was prepared in a clean utility room. Opportunities for improvement were identified in relation to the hygienic management of the medication preparation area and equipment. The medication preparation surface in this room was cluttered with various objects such as medication stock items. In addition, patient's dentures in plastic containers were also located on this work surface which is not an appropriate storage area for such items.

Six procedure trays with integrated sharps containers located on the medication preparation area all bore red stains. Procedure trays should be effectively decontaminated after each use to reduce the risk of spread of blood borne viruses or bacteria. There was no separate utility sink in this room in which such items could be cleaned, this should be reviewed.

Red stains were visible on a procedure tray containing supplies for blood glucose monitoring. Red staining was also visible on a blood glucose monitor. Inspectors were informed that multiple supplies for blood glucose monitoring were brought to the point of care. It is recommended that only supplies for a single procedure are brought to the point of care to reduce the risk of contamination of clean supplies with blood borne viruses or bacteria. Local practice in relation to the management and decontamination of such equipment requires improvement.

Multi dose vials of insulin medication and insulin containing pens were labelled to indicate single patient use as appropriate. However, multi dose vials were not labelled with the date of opening as recommended.

Renal Dialysis Unit

Inspectors observed nurses using aseptic non-touch technique during intravascular device and arteriovenous fistula management as appropriate.

There was a designated surface within a clinical room for the preparation of medication for injection however; this surface contained multiple storage containers. It is recommended that the medication preparation area is kept clear of supplies so

that there is sufficient space in which to prepare medications and to facilitate cleaning. A blood glucose monitoring device was charged on this surface, it is recommended that blood glucose monitors are not stored on the medication preparation surface to avoid inadvertent contamination.

Overall space within this room was limited and there was no clinical hand wash sink for staff in the room. A medication fridge was located in the open plan treatment area rather than in a clean utility room as appropriate.

Multi dose vials were not used in the dialysis unit which is good practice. Patients managed insulin pens themselves. A tray containing multiple supplies for blood sampling was dusty; this was addressed at the time of inspection.

In line with European Union Sharps Directive and Regulations 2010/32/EU¹⁵ the hospital had introduced safe needle technology to reduce sharps injuries among staff. Devices such as fistula needles and needles used to obtain blood samples with integrated safety mechanisms to reduce the risk of sharps injury to staff were used in the unit as appropriate. New intravascular device hubs had been introduced to reduce the risk of splashing blood when a patient was being disconnected from a dialysis circuit. Staff in the unit were aiming to reduce the use of needles that could pose a risk of sharps injury and were hoping to implement prefilled syringes of saline for flushing of intravascular devices.

2.6.3 Other measures to prevent the transmission of infection

Hand hygiene

The Mater Misericordiae University Hospital participates in the national hand hygiene audits, results of which are published twice a year. The hospital achieved 94.3% hand hygiene compliance in June 2017 which exceeded the HSE's desirable target of 90% hand hygiene compliance among staff.

Staff hand hygiene compliance was 93% for the surgical ward inspected in August 2017. In the Renal Dialysis Unit, staff hand hygiene compliance in local hand hygiene audits was 90% for October to December 2016. Hand hygiene had not been audited in the Renal Dialysis Unit in 2017.

The Infection Prevention and Control Team organised annual Hand Hygiene Awareness Days in line with the World Health Organisation 'save lives: clean hands campaign'. This year's hand hygiene awareness theme was the importance of hand hygiene in fighting antimicrobial resistance. Clinical hand-hygiene facilities had been upgraded across the hospital.

Outbreak management

Discussion with staff and review of documentation showed that outbreak control teams were convened to advise and oversee the management of outbreaks of infection at the hospital. Review of documentation showed that minutes of these meetings were recorded. A summary sheet in respect of one norovirus outbreak showed the number of patients affected, duration of the outbreak, bed closures, specimens taken and number of staff if any affected. Summary information and control measures implemented during outbreaks of infection were included in the Infection Prevention and Control Team annual report for 2016. National Standards recommend that a report outlining the outcome of an investigation of an outbreak is presented to senior management, with feedback of outbreak control learning points provided to staff to identify any areas for improvement.

Prevention of water-borne infection

The hospital had implemented a number of control measures in relation to legionella prevention such as water temperature control, on-line chlorine dioxide dosing, removal of dead end pipes, and routine outlet flushing with monthly water sampling. Control measures and regular water sample results in respect of legionella testing were overseen by the Indirect Infection Prevention and Control Committee.

Inspectors were informed that legionella risk assessments were carried out annually across the entire hospital campus and that these were independently audited every one to two years. Documentation reviewed showed that the most recent independent legionella risk assessments were performed in various parts of the hospital campus in 2017.

2.7 Quality improvement initiatives

Hospital management were asked to provide inspectors with information about any quality improvement initiatives or new measures that had been implemented in relation to the prevention and control of infection at the hospital. Efforts to enhance the prevention and control of healthcare-associated infection at the hospital included the following initiative:

- a quality improvement project undertaken by the Infection Prevention Control Team, microbiology laboratory staff and emergency department staff to assess the impact of rapid in-house influenza screening for patients presenting to the hospital with influenza-like illness. The project team demonstrated potential benefits of this initiative which included cost savings and improved patient flow. The project team received a local award for this work and subsequent to this inspection won the 2017 Irish Healthcare Award for hospital project of the year.

2.8 Progress since the previous HIQA inspection

Hospital management had developed a quality improvement plan in relation to the prevention and control of healthcare-associated infection and hygiene following the last HIQA inspection in 2015. Documentation reviewed by inspectors showed that improvement measures implemented at the hospital included the following:

- the appointment of an environmental quality manager
- allocation of a designated cleaning operative to each clinical area
- a review of the environmental hygiene monitoring process and revision of hygiene monitoring tools
- introduction of a revised patient equipment and bed cleaning programme
- review of the use and management of fans in clinical areas
- phased upgrade of wards in the Mc Givney Wing and in other parts of the hospital
- commencement of implementation of care bundles across the hospital
- upgrading of clinical hand wash sinks
- a wheelchair cleaning project and associated staff training
- a new programme was designed for the delivery of hygiene training to healthcare assistants
- a hospital wide commode audit and subsequent replacement programme commenced in February 2017.

3. Conclusion

Inspectors found that there were clear lines of accountability and responsibility in relation to governance and management arrangements for the prevention and control of healthcare-associated infection at the hospital.

There was good oversight at executive management level of both process and outcome measures in relation to the prevention and control of healthcare-associated infection at the hospital. A need for increased microbiology laboratory infrastructure and resources had been identified at the hospital. Some essential elements of an infection prevention and control programme required progression and development.

A number of infection prevention and control policies were due for review, the Infection Prevention and Control Team was in the process of updating local policies and procedures. Staff education in relation to infection prevention and control at the hospital needs to be expanded in line with current national guidelines.

There were systems and processes in place to identify and manage patients with transmissible infection and improvements in hospital isolation capacity meant that most patients who required isolation could be isolated in single rooms as recommended. Hospital management was working to address ongoing overcrowding issues in the Emergency Department and also hoped to increase inpatient bed capacity.

A quality improvement project undertaken at the hospital demonstrated that rapid influenza testing onsite resulted in cost savings and improved patient flow.

Hospital staff achieved 94% hand hygiene compliance in the National hand hygiene audit May 2017 which exceeded the HSE's desirable target of 90% hand hygiene compliance.

Peripheral vascular catheter care bundles had recently been implemented in most clinical areas. Care bundles in relation to urinary catheters, central vascular catheters and peripherally inserted central catheters were not in place in the hospital, this needs to be progressed at the hospital.

Surveillance of surgical site infection was performed in the cardiac and spinal surgery services. This is good practice and should be used to identify and address any opportunities for improvement. Surveillance of healthcare-associated infections at the hospital should be further resourced and expanded.

Opportunities for improvement were identified in relation to the management of equipment and supplies in the surgical ward inspected. A need for improved management of patient equipment cleaning was also identified in this ward. Cleaning should be sufficiently resourced in clinical areas.

The infrastructure, maintenance and design of the Renal Dialysis Unit which was located in one of the oldest parts of the hospital needs to be addressed in the hospital site development plan going forward. Remedial work to address drainage issues in the Renal Dialysis Unit needs to be undertaken as a priority.

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5. Appendix 1: Lines of enquiry for the monitoring programme undertaken against the *National Standards for the prevention and control of healthcare-associated infections in acute healthcare services*

Number	Line of enquiry	Relevant National Standard
1.1	The hospital has formalised governance arrangements with clear lines of accountability and responsibility around the prevention and control of healthcare-associated infections.	2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 5.2, 5.3, 5.4, 6.1, 7.1
1.2	Risks in relation to the prevention and control of infection are identified and managed.	2.1, 2.3, 2.5, 3.1, 3.6, 3.7, 3.8
2	The hospital has policies, procedures and guidelines in relation to the prevention and control of infection and hospital hygiene.	2.1, 2.5, 3.1, 3.6, 3.8, 5.4, 7.2
3	Hospital personnel are trained and in relation to the prevention and control of healthcare-associated infection	2.1, 2.8, 3.1, 3.2, 3.3, 3.6, 6.1, 6.2
4.1	The hospital has implemented evidence-based best practice to prevent intravascular device-related infection and urinary catheter-associated infection, ventilator-associated pneumonia and surgical site infection.	1.1, 2.1, 2.3, 3.5
4.2	The hospital has systems in place to detect, prevent, and respond to healthcare-associated infections and multidrug resistant organisms in line with national guidelines.	2.1, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.8,

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