



**Health
Information
and Quality
Authority**

An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

Report of the unannounced inspection at St. Michael's Hospital, Dun Laoghaire.

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: 13 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.
- **Health Technology Assessment** — Providing advice that enables the best outcome for people who use our health service and the best use of resources by evaluating the clinical effectiveness and cost-effectiveness of drugs, equipment, diagnostic techniques and health promotion and protection activities.
- **Health Information** — Advising on the efficient and secure collection and sharing of health information, setting standards, evaluating information resources and publishing information about the delivery and performance of Ireland's health and social care 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 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 St. Michael's Hospital by Authorised Persons from HIQA; Emma Cooke and Noreen Flannelly-Kinsella. The inspection was carried out on 13 October 2017 between 09:20hrs and 16:50hrs.

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:

- the High Dependency and Coronary Care Unit
- a medical-surgical ward

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)
- Prevention and control of transmission 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 St. Michael's 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

St. Michael's Hospital is a voluntary public acute hospital and is part of the Ireland East Hospital Group. The General Manager as the person with overall accountability and responsibility for the hospital reported to and attended monthly performance meetings with the Chief Executive Officer of the Ireland East Hospital Group. The General Manager was accountable for the overall management and monitoring of the prevention and control of healthcare-associated infection at the hospital.

St. Michael's Hospital also formed part of the St. Vincent's Healthcare Group with St. Vincent's University Hospital and St. Vincent's Private Hospital. While the hospital had independent governance arrangements for the prevention and control of healthcare-associated infection, there was also evidence of reporting lines to the St. Vincent's Healthcare Group.

Inspectors found that there were governance and management arrangements in place for the prevention and control of healthcare-associated infection in St. Michael's Hospital. The Infection Prevention and Control Committee co-ordinated and provided oversight of the infection prevention and control programme. The committee which was chaired by the General Manager had defined terms of reference detailing the membership of the group. The terms of reference for this committee did not detail the frequency of meetings or required quorum. The committee had multi-disciplinary membership which included infection prevention and control nurses, a clinical microbiologist, pharmacist and medical consultant and managers from nursing, practice development, hygiene and facilities services, the finance department, occupational health, catering and risk management.

An external authorised person for decontamination* was also requested to attend the meetings as required. Minutes of committee meetings reviewed showed that although meetings were well attended, attendance at meetings by some members was variable.

Documentation reviewed by inspectors showed that the committee met monthly and followed a standardised agenda which included feedback and consideration of the following issues:

- infection prevention and control standards and key performance indicators
- surveillance reports and antimicrobial stewardship reports
- decontamination standards
- risk management
- staff education including hand hygiene
- patient complaints and satisfaction surveys
- water management, facilities and waste management
- occupational health
- hygiene services and catering services
- signage, new products, finance and project developments.

The Infection Prevention and Control Committee reported into the Patient Safety Committee who met quarterly. Membership of this committee also included the General Manager. Minutes of the Patient Safety Committee reviewed by inspectors showed that infection prevention and control was not a standing agenda item and was not referred to specifically in the minutes. A regular reporting structure to such oversight committees should be formalised going forward. Documentation received by inspectors following this inspection stated that infection prevention and control was included as a standing agenda item at the Patient Safety Committee as of the end of September 2017.

The Patient Safety Committee reported to St. Michael's Hospital Executive Council and produced monthly patient safety reports for St. Vincent's Hospital Group Risk Quality and Safety Committee. The General Manager reported from St. Michael's Hospital Executive Council to the Ireland East Hospital Group.

Hospital management informed inspectors that a new Healthcare-Associated Infection and Antimicrobial Resistance Group had recently convened in the Ireland East Hospital Group and was attended by the HSE National Lead for Healthcare-Associated Infection and Antimicrobial Resistance. Inspectors were informed that the meeting was chaired by the Ireland East Hospital Group Chief Executive Officer and

* An authorised person for decontamination is defined as an independent suitably qualified person possessing the necessary skills and technical knowledge required for the operational management and decontamination of medical equipment.

the group was in the process of formalising terms of reference. Representation from St. Michael's Hospital infection prevention and control team attended this meeting. This is a positive development and facilitates effective oversight at hospital group level in relation to the prevention and control of healthcare-associated infection.

Infection prevention and control service

The infection prevention and control service at St. Michael's Hospital was overseen by the Infection Prevention and Control Committee and delivered by the Infection Prevention and Control Team. The team advised on all aspects of infection prevention and control, performed surveillance of alert organisms[†] and delivered education to all grades of staff.

The team was led by a consultant microbiologist who was based at St. Vincent's University Hospital and who attended the hospital in person one session each week for five hours. It was reported to inspectors that the Consultant Microbiologist attended hospital antimicrobial stewardship ward rounds, infection prevention and control team meetings and infection prevention and control committee meetings.

Clinical microbiology services were provided for the hospital at St. Vincent's University Hospital and consultant microbiologist advice was available to clinical staff by telephone on a 24-hour basis seven-days-a-week in line with National Standards. This advice was provided on a rotational basis by consultant microbiologists based at St. Vincent's University Hospital.

The Infection Prevention and Control Team membership also included a 2.5 whole time equivalent (WTE)[‡] infection prevention and control nursing complement. This comprised of one newly appointed infection prevention and control clinical nurse manager 3, one WTE infection prevention and control clinical nurse specialist and one 0.5 WTE surgical site surveillance nurse.

St. Michael's Hospital did not have a dedicated antimicrobial stewardship pharmacist, however, advice was available from a clinical pharmacist based at the hospital. The clinical pharmacist also attended antimicrobial stewardship rounds which had established links with an antimicrobial stewardship committee at St. Vincent's University Hospital. Access to a surveillance scientist was available at St. Vincent's University Hospital. The team did not have a dedicated administrative resource to support the implementation of their infection prevention and control programme. National mandated reporting in respect of healthcare-associated infection at the

[†] Alert organisms are micro-organisms that pose a significant risk of transmission to non-infected patients or healthcare workers.

[‡] 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.

hospital was performed by the Infection Prevention and Control Nurses and overseen by the Consultant Microbiologist.

The team provided guidance and advice to hospital committees and departments in relation to refurbishment and building projects, decontamination and purchasing of patient equipment.

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 Health Service Executive national reporting requirements:

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

The Infection Prevention and Control Team also monitored local performance indicators as follows:

- surveillance of 'alert' organisms and 'alert' conditions[§]
- data reported to the European Antimicrobial Resistant Surveillance Network (EARS-Net)^{**}
- new cases of Carbapenemase Producing *Enterobacteriaceae*^{††}
- clusters or outbreaks of infection.

The hospital devised and monitored local hospital key performance indicators in relation to infection prevention and control. These included the following:

- number of new cases of Methicillin-Resistant *Staphylococcus aureus*
- rate of acquisition of Methicillin-Resistant *Staphylococcus aureus* in the hospital
- number of new cases of *Clostridium difficile* infection
- rate of acquisition of *Clostridium difficile* infection in the hospital
- staff compliance with hand hygiene

[§] 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*.

^{††} Carbapenemase Producing *Enterobacteriaceae* (CPE), are a family of Gram-negative bacteria which can cause infections that are difficult to treat because of high levels of resistance to antimicrobials.

- number of *Staphylococcus aureus* bloodstream infection.
- number of new cases of Carbapenem-Resistant *Enterobacteriaceae*
- rate of acquisition of Carbapenem-Resistant *Enterobacteriaceae* in the hospital
- number of new cases of Vancomycin-Resistant *Enterococci*.

Key performance indicators were reported by the team at monthly infection prevention and control committee meetings and quarterly at the Hospital Executive Council. Surveillance reports reviewed showed that a root cause analysis was performed following a case of hospital-acquired *Clostridium difficile* infection. Hospital rates in respect of *Clostridium difficile* infection remained below the national HSE performance indicator for quarter two 2017. The hospital had developed a *Clostridium difficile* infection care bundle which was due to be implemented shortly.

An influenza infection report for 2016-2017 season reviewed by inspectors showed that 35% of cases of influenza were hospital-acquired during this time. The report indicated that once the possibility of an influenza infection diagnosis was considered, patients were immediately isolated with appropriate infection control precautions. There were no recent reported outbreaks of influenza infection at the time of inspection.

St Michael's Hospital had devised a monthly audit schedule for 2017 for clinical areas in the hospital. Audits included hand hygiene compliance and facilities, use of personal protective equipment and isolation precautions, environment and patient equipment hygiene and commode cleanliness. Environmental and patient equipment hygiene audits were performed on a quarterly basis by the Infection Prevention and Control Team and on a monthly basis by the external cleaning contractors in the hospital. Additionally inspectors were informed that independent hygiene audits were undertaken by external auditors twice yearly in the hospital which is appropriate. Inspectors were informed that audit results were collated and action plans sent to individual departments within two weeks following completion of the audit. Hospital hygiene audits results were trended and reported at monthly infection prevention and control committee meetings and hygiene meetings and the Hospital Executive Council meeting.

Inspectors were informed that complaints received from patients were referred to the Infection Prevention and Control Team if concerns around infection prevention and control were identified. HSE Nursing Quality Care Metrics were monitored across the hospital in relation to aspects of care. Other process measures monitored at the hospital included care bundle implementation and hand hygiene. Findings in this regard will be presented in section 2.5 and 2.6 of this report.

2.2 Risk management

Line of enquiry 1.2

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

St. Michael's Hospital had systems in place to identify and manage risk in relation to the prevention and control of healthcare-associated infection.

Hospital managers told inspectors that it was hospital policy to report incidents related to the prevention and control of healthcare-associated infection through the hospital incident management system. These were then uploaded to the National Incident Management System. The hospital Quality and Risk Manager provided regular information on relevant incidents and risks to the Infection Prevention and Control Team.

Infection control related risks and incidents were also discussed at the Infection Prevention and Control Committee. Minutes of meetings reviewed by inspectors showed that risk management was a standing agenda item and the Quality and Risk Manager was also a member of this committee. Inspectors were informed that risks in relation to infection prevention and control were further escalated to St. Michael's Hospital Executive Council and St. Vincent's Hospital Group Risk, Quality and Safety Committee. It was also reported that risks which could not be effectively mitigated at this level were further escalated by the Hospital Manager to the Ireland East Hospital Group.

Risks in relation to infection prevention and control were outlined to inspectors by hospital management. These included a lack of en-suite isolation facilities, inadequate spatial separation in multi-occupancy rooms and a lack of dedicated computer software to facilitate infection control alerts.

The Infection Prevention and Control Team had carried out a risk assessment in relation to the effective implementation of the infection prevention and control programme in June 2017. Moderate-rated risks recorded were in relation to the clinical environment, patient care equipment, implementation of infection prevention and control policies, staff education and team resources. A number of major-rated risks identified by the team included the following:

- healthcare-associated infections and multidrug-resistant organisms
- outbreaks of infection
- consultant microbiology staffing
- shortage of antimicrobial agents
- staff immunisation
- lack of airborne isolation room in the Emergency Department

- legionella infection
- inadequate single en-suite rooms.

The above risks were amalgamated into one overarching risk which was escalated to the hospitals' corporate risk register. The hospital's corporate risk register^{††} was last updated in quarter one 2017 and a moderate risk recorded in relation to infection prevention and control related to a systems failure in complying with Health Service Executive (HSE) standards resulting in an actual and potential infection control outbreak. To address this identified risk the hospital had implemented a number of control measures. These included hospital self-assessments against the National Standards, development of an infection control continuous plan, corporate hygiene oversight, an infection control programme, a decontamination committee, grand rounds,^{§§} internal audits and allocation of isolation rooms.

Hospital management was working to mitigate risks in respect of hospital infrastructure through gradual upgrading and ongoing refurbishment plans of existing facilities. The hospital had made an application for capital funding for development of a new operating theatre department.

The hospital produced monthly patient safety reports and a review of the reports received showed that incidents in relation to infection prevention and control were included.

^{††} A risk register is a database of assessed risks that face any organisation at any one time. Always changing to reflect the dynamic nature of risks and the organisation's management of them, its purpose is to help hospital managers prioritise available resources to minimise risk and target improvements to best effect. The risk register provides management with a high level overview of the hospital's risk status at a particular point in time and becomes an active tool for the monitoring of actions to be taken to mitigate risk.

^{§§} Grand rounds are formal meetings where physicians and other clinical support and administrative staff discuss the clinical case of one or more patients. Grand rounds originated as part of medical training

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.

Inspectors found that the hospital had a suite of infection prevention and control policies in relation to standard precautions, transmission-based precautions and the prevention of invasive device-related infection. Hospital policies, procedures and guidelines were available to staff in both electronic format on the hospital intranet and in hard copy folders in clinical areas. It was practice that hospital policies relevant to infection prevention and control were reviewed and approved by the Policy and Procedural Committee and ratified by the Consultant Microbiologist.

Current HSE policy states that hospital policies, procedures and guidelines should be reviewed every three years.³ Inspectors observed that a number of policies had recently been updated including a policy in relation to the management of a patient with Carbapenem Producing *Enterobacteriaceae*. Hospital managers stated that a number of policies were either under review or in draft at the time of inspection. Some of the policies reviewed were due for review, in particular policies relating to urinary catheter and peripheral vascular catheter insertion.

The hospital did not have a controlled electronic document management system. It is recommended that the Infection Prevention and Control Committee formalises the process in relation to reviewing and controlling policies, procedures and guidelines to ensure staff only have access to the most up to date version. Going forward there is potential for standardising policies across the Ireland East Hospital Group. Such an initiative would also facilitate executive oversight of infection prevention and control policies, procedures and guidelines at the Ireland East Hospital Group level.

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.

National hand hygiene guidelines recommend that hand hygiene training should be mandatory for relevant staff at induction and every two years thereafter.⁴ Inspectors were informed that infection prevention and control education was mandatory for relevant hospital staff at induction and two yearly thereafter. Content included standard and transmission-based precautions and hand hygiene training.

At the time of inspection, documentation provided to inspectors showed that 82% of relevant hospital staff were up-to-date with hand hygiene and infection prevention and control training. Data breakdown per discipline showed 91% of nursing staff and 81% of medical staff were up-to-date with mandatory training. Additionally 92% to 93% of staff were up-to-date with mandatory training in both clinical areas inspected.

Infection prevention and control training sessions were provided by the Infection Prevention and Control Team on a monthly basis and included hand hygiene, waste management and standard and transmission-based precautions. The team also provided training on legionella and aspergillosis infection and prevention of intravascular catheter-related infection. Informal training sessions were also provided as required. It was reported that the hospital was aligning infection prevention and control education for staff to the national framework for such knowledge and skills.⁵

All staff at the hospital had access to advice from the Infection Prevention and Control Team and clinical staff had access to advice from clinical microbiology staff.

Staff attendance at training was recorded using an electronic system which facilitated central tracking and trending of attendance by each clinical area and staff discipline.

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^{6,7,8} published in recent years recommending their introduction across the Irish health system. The implementation of care bundles to prevent invasive device-related infection was reviewed in the clinical areas inspected.

Inspectors were informed that peripheral vascular catheter care bundles and urinary catheter care bundles had been implemented throughout the hospital in line with national guidelines. Monitoring compliance with care bundles are important process measures for evaluation of catheter-related blood stream infection preventative programmes. Documentation reviewed by inspectors showed that compliance with peripheral vascular catheter and urinary catheter care bundles across the hospital was audited in April and December 2016 and March 2017.

Inspectors looked at aspects of the prevention of invasive device-related infection in the High Dependency and Coronary Care Unit and found that staff were committed to implementing evidence-based practice in order to reduce the risk of infection for patients. Peripheral vascular catheter care bundles and urinary catheter care bundle audits showed 100% compliance in March 2017.

In the medical-surgical ward inspected, peripheral vascular catheter care bundle audits showed compliance varied from 80% in December 2016 to 30% in March 2017. Urinary catheter care bundle audits also showed compliance varied from 80% compliance in December 2016 to 50% compliance in March 2017.

Overall HIQA found that further improvement in relation to care bundle implementation was indicated in order to fully embed the use of care bundles into practice. Evidence indicates that full compliance with all essential care bundle components improve patient outcomes. Inspectors were informed that the Infection Prevention and Control Team were planning to increase the frequency of care bundle compliance audits in the coming months.

*** A bundle is a small, straightforward set of evidence-based practices that, when performed collectively and reliably, have been proven to improve patient outcomes.

The Infection Prevention and Control Team performed a local point prevalence study in respect of catheter-associated infections during care bundle compliance audits in March 2017 which represents good practice.

2.5.2 Surveillance of invasive device-related and surgical site infection

The surveillance^{†††} of healthcare-associated infection is one of the core components of an effective infection prevention and control programme.^{9,10,11} National guidelines recommend healthcare-associated infection surveillance in relation to surgical site infection, central venous access device-related infection, urinary catheter-associated urinary tract infection and ventilator-associated pneumonia.^{12,13,14} Other health systems have advanced the surveillance of healthcare-associated infection to the benefit of both patients and health service providers by demonstrating reductions in these type of infections.^{15,16}

Inspectors were informed that surgical site infection surveillance was suspended in the hospital in 2016 due to staffing resources. Implementation of healthcare-associated infection surveillance programmes requires dedicated resources and expertise. Inspectors were informed that the hospital was in the process of setting up a new surgical site committee and redefining their surgical site surveillance programme. It is recommended that surveillance of healthcare-associated infection is targeted in patients at greatest risk of infection or in areas where deficiencies have been identified. Surveillance of catheter-associated urinary tract infection was not routinely performed in the hospital.

Performance data relating to alert organism surveillance in respect of Methicillin-Resistant *Staphylococcus aureus* was openly displayed on a quality board in the medical-surgical ward inspected. Data results showed that no new cases of Methicillin-Resistant *Staphylococcus aureus* were reported in the ward for October 2017.

^{†††} Surveillance is defined as the ongoing, systematic collection, analysis, interpretation and evaluation of health data closely integrated with the timely dissemination of these data to those who need it.

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 systems, structures and processes in place at St. Michael's Hospital to detect, prevent and respond to healthcare-associated infections and multidrug-resistant organisms in line with national guidelines.

Hospital isolation facilities

Patients with suspected or confirmed communicable disease including healthcare-associated infection and multidrug-resistant organisms should be placed in a suitable isolation room, single room or cohort area, in line with national guidelines.^{17,18}

Hospital managers told inspectors that there were 120 inpatient beds in St. Michael's Hospital of which there were 38 single rooms. Only two of the single rooms had ensuite toilet facilities which is less than ideal from an infection prevention and control perspective. On the day of inspection 12 inpatients required isolation of which nine were isolated in single rooms throughout the hospital. Three contact⁺⁺⁺ patients were being cohorted^{§§§} in a multi-occupancy room in the medical-surgical ward inspected, with contact isolation precautions as appropriate. The hospital did not have isolation facilities with specialised ventilation required for managing patients with airborne infection. Patients requiring airborne isolation facilities should be managed in a hospital equipped for this purpose.

The Infection Prevention and Control Team had devised a hierarchy of isolation prioritisation policy for management of patients with transmissible infection. The policy provided staff with a quick reference guide in relation to screening and isolation requirements for patients colonised^{****} or infected with a transmissible

⁺⁺⁺ A contact patient is a patient that has come in close contact with a patient known to have a transmissible infection.

^{§§§} A cohort area is a bay and or a ward in which a group of patients (cohort) with the same infection are placed together. 'Cohorting' of patients classically means the separation of those patients and their nursing staff from other patients because single room isolation facilities are not available. It is generally used as a measure of last resort in situations where single room capacity is greatly exceeded by the number of patients who are colonised with a particular alert organism, in an effort to prevent cross transmission from this patient cohort to the wider hospital patient population.

^{****} Colonisation is the presence of bacteria on a body surface (like on the skin, mouth, intestines or airway) without causing disease in the person. Infection is the invasion of a person's bodily tissues by disease-causing organisms.

infection.

Microbiological screening of patients

Patients were assessed on admission to determine if they had symptoms of infection or if they had a history of being colonised with a transmissible infection. A computerised system in the Emergency Department enabled staff to identify patients on admission who were previously colonised or infected with a transmissible infection so that appropriate screening and suitable accommodation could be arranged. Inspectors were informed that hospital management were working towards implementing a similar computerised system throughout the hospital and establishing an integrated computer system link with St. Vincent's University Hospital.

A daily isolation list identifying patients who required transmission-based precautions was produced by the Infection Prevention and Control Team and daily ward rounds in clinical areas were undertaken by the team. The purpose of these rounds was to check the isolation status of patients, provide advice to ward staff and check if the correct signage and control measures were in place as indicated. The team also alerted staff to patients previously colonised or infected with resistant bacteria by placing a discreet alert sign on patient healthcare records. Nursing admission documentation reviewed by inspectors was noted to include a section in relation to infection history and a prompt for nurses to ask if the patient had been previously colonised or infected with Methicillin-Resistant *Staphylococcus aureus*.

The hospital produced a screening reference guide for multidrug-resistant organisms which identified the patients to be screened, targeted organism and screening sites. Staff reported that screening of patients for multidrug-resistant organisms was performed in line with national guidelines in the hospital.

Inspectors looked at implementation of aspects of transmission-based precautions to assess the prevention and control of transmission of antimicrobial-resistant bacteria in the clinical areas inspected.

Medical-Surgical Ward

The medical-surgical ward could accommodate 20 patients and was divided into two separate areas by a public corridor. The ward comprised six single rooms, one four-bedded room and two five-bedded rooms. None of the single rooms had en-suite toilet facilities which is not ideal from an infection prevention and control perspective. On the day of inspection eight patients in this ward required transmission-based precautions. Five of these patients were accommodated in single rooms and three patients were cohorted in a four bed multi-occupancy room with the fourth bed in the room not in use. Some doors to isolation rooms

accommodating patients requiring transmission-based precautions were open. Isolation room doors should be kept closed as far as possible otherwise a risk assessment should be performed to determine the appropriateness of this action.

Overall the patient environment reviewed was generally clean with few exceptions. However opportunities for improvement in relation to patient equipment hygiene was observed during this inspection. A number of items of patient equipment were either stained or dusty which included an electronic thermometer, a blood pressure cuff and an intravenous drip stand. Brown staining was observed on two commodes stored in the 'dirty'⁺⁺⁺ utility room. Additionally three unclean suction machines with suction tubing attached were stored in an equipment room; these issues were communicated to the manager and addressed at the time of the inspection. Patient washbowls for patients with transmissible infection and non-infected patients were decontaminated and stored in a 'dirty' utility room. The hospital should ensure that dedicated patient equipment for isolated and or cohorted patients is stored appropriately so as to avoid transmission of infection.

A patient equipment cleaning logbook reviewed by an inspector showed that the cleaning of patient equipment had not been performed in line with national minimum cleaning frequencies. The inspector was informed that staff responsible for cleaning patient equipment at times had competing demands such as direct patient care needs. There appeared to be a lack of clarity in relation to a named person responsible for the daily cleaning of some patient equipment items. The hospital should review patient equipment hygiene in relation to cleaning specifications, resources, cleaning practices and related assurance arrangements to ensure compliance with national standards and recommended guidelines.^{19,20}

The Infection Prevention and Control Team conducted quarterly audits across clinical areas in the hospital in relation to commode cleanliness compliance. Audit results showed five of six clinical areas audited achieved 100% compliance in relation to commode cleanliness compliance in quarter three 2017. This was not reflective of inspection findings in one clinical area visited on the day.

Environment and patient equipment hygiene audits results reviewed by inspectors showed 84% and 75% compliance in June and September 2017 respectively on the medical-surgical ward. Environmental and patient equipment audit reports included action plans for corrective action, named persons responsible and timeframes recorded.

⁺⁺⁺ A room equipped for the disposal of body fluids and the decontamination of reusable equipment such as bedpans, urinals, commodes and body fluid measuring jugs. Waste, used linen and contaminated instruments may also be temporarily stored in this room prior to collection for disposal, laundering or decontamination.

Bed spacing in some of the multi-occupancy rooms was less than ideal. Treatment of patients in close proximity to each other increases the risk of spread of many infections including those caused by multidrug-resistant organisms. A risk-based approach should be taken to ensure that spatial separation and the environment is appropriate for carrying out clinical activities and undertaking manual handling operations which collectively reduce the risk of spreading infection.

High Dependency and Coronary Care Unit

The overall infrastructure of the High Dependency and Coronary Care Unit was not optimal from an infection prevention and control perspective. The configuration and design was dated and did not meet the desirable standards of a modern critical care facility²¹ and did not facilitate the management of patients with transmissible infection.

This unit could accommodate five patients. Three beds were located in an open plan area of the unit and an additional two beds were located in a room to the rear of the open plan area. Staff reported that patients with transmissible infection were managed in the two-bedded room. All patients in the unit shared one toilet facility located on the corridor thereby patients in the two-bedded room had to walk through the open plan area of the unit to access this toilet. Staff also had to transport commodes through the open plan area to the two-bedded room if required. There were no shower facilities in the unit therefore patients had to access shower facilities in other clinical areas in the hospital if suitable. This configuration is less than ideal particularly for patients with transmissible infection who are isolated in the two-bedded room.

Overall storage space in the unit was limited and there was a lack of sufficient space in which to store and manage patient equipment and consumables. Shelves and cupboards for storage of patient equipment were located within a patient zone area in the unit. Such equipment included a portable non-invasive mechanical ventilator and a suction machine that were not in use. Both of these items were uncovered which posed a risk of inadvertent contamination of clean items. Such storage of clean patient equipment is not recommended and an appropriate storage area should be identified so that patient equipment can be kept clean and dust-free.

Office equipment including a computer terminal, kitchen equipment and a table and chairs for staff were located within an ancillary room which opened directly into the open plan patient care area which is less than ideal. Use of this room as both an office, kitchen and staff room is not appropriate and requires review.

The dirty 'utility' room was small in size with limited space for staff movement or for storage of relevant equipment. Patient commodes were therefore inappropriately stored with waste disposal containers in a waste disposal collection room in the unit.

This arrangement posed a risk of inadvertent contamination of these items and does not facilitate effective cleaning of this area. The hospital needs to review these arrangements as a matter of priority.

Overall environmental surfaces and patient equipment items inspected were visibly clean with few exceptions. Inspectors viewed the findings of a hygiene audit undertaken in February 2017; however the results were difficult to interpret. In order to facilitate an ongoing quality improvement process and to provide assurance to hospital management that hygiene standards are being met, audit reports should be presented in a manner that is meaningful and easy to interpret.

Results of an environmental and patient equipment hygiene audit performed by the Infection Prevention and Control Team in September 2017 showed 58% compliance with desirable standards. Inspectors observed that cleaning resources allocated to environmental hygiene in the High Dependency and Coronary Care Unit were limited. Additionally the unit did not have dedicated personnel responsible for cleaning patient equipment apart from nursing staff who were assigned to these and other environmental hygiene duties. The inspector was informed that nursing staff did not always have time to perform routine cleaning in line with periodic cleaning schedules due to patient care needs.

Cleaning frequencies should be in line with recommended minimum cleaning frequencies for higher risks areas. This unit is considered a high risk area and therefore should have the necessary resources required to ensure that the environment and patient equipment is cleaned in line with minimum cleaning frequencies consistently. It is recommended that cleaning resources assigned to this unit is reviewed to provide assurances that the service provided is appropriate for the requirements of the unit on a continual basis. The time taken to undertake cleaning tasks should be measured and used to calculate the cleaning resources required.

The infrastructure of the High Dependency and Coronary Care Unit did not facilitate effective infection prevention and control. In the interim of any capital development, it is recommended that the storage of patient equipment and supplies in the unit is reviewed and improved upon. Hospital management should include a review of the design of this facility in their site development plans going forward. It is recommended that patient care areas are designed in line with recommended hospital building guidelines appropriate for the function of the clinical area and include appropriate provision for isolation facilities, toilet, shower and hand washing facilities, ancillary rooms and storage requirements.²¹

2.6.2 Safe injection practice

Inspectors reviewed elements of safe injection practice and implementation of aspects of standard precautions in the High Dependency and Coronary Care Unit inspected.

Staff who spoke with inspectors were able to describe recommended practice in relation to giving injections safely. The unit did not have a clean utility room or a clearly designated area for medication preparation. Nurses prepared medication for injection on an intravenous medication trolley located in the open plan aspect of the unit. Thermometers and boxes of gloves were also stored on the trolley space.

A blood sample analyser was inappropriately located on a staff workstation in the open plan area of the unit. The analyser was found to have a small red stain present which was immediately addressed by staff. It is recommended that blood analysers are located in an appropriate location with hand hygiene and equipment cleaning facilities to avoid the risk of contamination of clean items with blood.

Sticky residue was present on two integrated sharps trays which did not appear to have been effectively cleaned after use. Sticky residue deposits do not facilitate effective cleaning. Integrated sharps trays used for intravenous medication administration, a blood glucose monitor and ketone meter machine were stored on shelving within a patient zone area in the open plan aspect of the unit which is not recommended. It is acknowledged that space is limited however, in the interim it is recommended that there is a clear, uncluttered worktop space allocated for medication preparation.

During this inspection, a plastic bag containing prepared emergency intravenous anaesthetic medication was observed located in a medication fridge in a store room in the High Dependency and Coronary Care Unit. This medication fridge was also used by staff in the theatre department. The bag contained multiple syringes of injectable medication which were either unlabelled or insufficiently labelled. Additionally three prefilled syringes were uncapped which posed a risk of inadvertent contamination. A prepared bag of saline with an injectable medication was also insufficiently labelled. To reduce the risk of transmission of infection to patients, intravenous medications should be prepared in a clean environment using an aseptic non-touch technique immediately prior to use where possible.²² This practice should be clinically risk assessed and consideration should be given to the introduction of commercially available single dose prefilled syringes or compounding of medications deemed to be required in a central pharmacy. This issue was escalated and addressed by hospital management on the day of inspection so that risks identified could be mitigated as a matter of priority. At the inspection close out meeting the hospital General Manager informed inspectors that this risk had also been reported to the Hospital Group Clinical Director.

In line with European Union Sharps Directive and Regulations 2010/32/EU²³ the hospital had introduced safe needle technology for adult patients to prevent sharps injuries among staff.

2.6.3 Other measures to prevent the transmission of infection

Hand hygiene

St. Michael's Hospital participates in the national hand hygiene audits, results of which are published twice per year. The hospital achieved 88.5% hand hygiene compliance rate in the national hand hygiene audit in June and July 2017 which is slightly below the HSE national hand hygiene compliance target of 90%.

Hand hygiene audits were performed quarterly by the Infection Prevention and Control Team in the hospital and an overall hospital hand hygiene compliance audit showed 87% compliance in July 2017. The team developed action plans in response to areas that did not achieve a hand hygiene compliance rate of 90% which included targeted education and the introduction of individual alcohol gel dispensers.

Documentation provided to inspectors showed hand hygiene compliance rates remained at 87% from July to September 2017. It is recommended that the hospital continues working towards achieving compliance with national hand hygiene targets.

Local hand hygiene compliance audits reviewed showed that the medical-surgical ward achieved 90% and the High Dependency and Coronary Care Unit achieved 93% compliance with hand hygiene in May 2017 which is commendable. Hand hygiene compliance audit results were fed back to all clinical areas through the Infection Prevention and Control Committee and circulated electronically. Hand hygiene audit results were also presented at hygiene team meetings and reported as an overall key performance indicator at St. Michael's Hospital Executive Council.

Prevention of healthcare-associated invasive Aspergillosis ****

There is potential risk to people with impaired immune systems of acquiring invasive Aspergillosis during construction or renovation activities in hospitals, therefore specific controls need to be put in place to prevent such occurrences. On the day of inspection hospital management reported that two minor refurbishment projects were in progress in the hospital which included upgrading toilets in a staff dining room and minor structural works in an outpatients department. Method statements for both projects had been completed. Infection Prevention and Control Team members informed inspectors that they provided advice in relation to control measures required to reduce potential risk of infection during refurbishments. The

**** Healthcare-associated invasive Aspergillosis is an infection that can be potentially life threatening in patients with impaired immune systems. It is caused by fungal spores that may be transmitted in dust created by excavation and building work.

Infection Prevention and Control Team had developed a maintenance works method statement outlining all infection prevention and control requirements that contractors must fulfil and complete prior to commencing works.

Inspectors were informed that the team were satisfied that recommended environmental controls were in place in line with national guidelines.²⁴ Inspectors reviewed a method statement for works in the outpatient department which included control measures such as closed windows to minimise noise and dust migration. Inspectors recommended a review of these controls as not all windows were closed at the start of inspection.

The hospital had recently issued a policy in relation to the prevention of aspergillosis during building works.

Prevention of water-borne infection

National guidelines recommend that a Legionella risk assessment is performed and reviewed on an annual basis or if significant changes to the water distribution system is detected and independently audited every two years.²⁵

A formal Legionella site risk assessment had been performed at the hospital in January 2016. It was reported that this was reviewed as appropriate. The control of Legionella at the hospital was co-ordinated by the Environmental Monitoring Committee which met monthly. The committee had developed a water management policy for the hospital.

Inspectors were informed that the hospital had implemented necessary measures to ensure that water system were maintained and monitored to mitigate the spread of healthcare-associated infections. These measures included installation of a copper silver-ionising treatment system and water temperature testing, and routine flushing and water sampling programme.

Documentation reviewed by inspectors showed that recent positive water sample results in relation to Legionella was evident in some outlets in the hospital. The hospital had implemented additional control measures to address these findings such as daily flushing and removal of affected shower facilities from patient use. Risks in relation to Legionella had been included in the Infection Prevention and Control risk assessment.

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 initiatives:

- A comprehensive patient satisfaction survey was developed by the hospital and completed on a quarterly basis in clinical areas in the hospital. Data in relation to the cleanliness of the patient environment was included in this survey. Patient evaluation is important to provide opportunities for improvement by using feedback to inform changes.
- A hospital flu vaccination programme for staff was implemented in 2017 and 42% of staff were vaccinated against influenza during the 2016 to 2017 season. This exceeded the HSE national target of 40%. Inspectors were informed that inpatients considered in 'at risk categories' were also offered the flu vaccine.

2.8 Progress since the previous HIQA inspection

HIQA reviewed the quality improvement plan²⁶ developed by the hospital following the 2016 HIQA inspection against the National Standards. Documentation reviewed showed that the hospital had completed a number of the actions identified which included the following:

- a mattress replacement programme was in place in the hospital and 90 mattresses had been replaced following a mattress audit in 2017
- the hospital had identified a suitable area to develop an equipment library for the storage of hospital equipment going forward
- Nursing HSE Quality Care Metrics had been introduced in the hospital
- an ongoing sink and bathroom refurbishment programme was underway and refurbishments were ongoing at the time of inspection.

Inspectors were informed that a number of remaining actions were in relation to quality improvements such as an ongoing hospital painting and bin replacement programme due for completion in 2018.

HIQA acknowledges the efforts made by the hospital to reduce some six-bedded patient rooms to five-bedded rooms in response to findings during the previous inspection. The hospital had made a capital application for funding for development of a new operating theatre department at the hospital.

The hospital had recently received a licence in relation to a 'HSE Productive Ward: Releasing Time to Care'²⁷ quality improvement initiative designed to streamline services to improve patient care.

3. Conclusion

Overall HIQA found that St. Michael's Hospital was endeavouring to fully implement the National Standards for the prevention and control of healthcare-associated infections in acute healthcare services. Governance and reporting arrangements for the prevention and control of healthcare-associated infections were in place in the hospital and had recently been further advanced by formalising reporting structures to an oversight committee. The recently convened Ireland East Hospital Group Healthcare-Associated Infection and Antimicrobial Resistance Group is a welcome development and will facilitate improved governance structures and sharing of evidence-based practice in relation to infection prevention and control across the group.

The hospital had systems in place to identify and manage risk and escalate serious risks to the St. Vincent's Healthcare Group and Ireland East Hospital Group level. The Infection Prevention and Control Team had put in place many elements of an infection prevention and control programme. The hospital had a programme of monitoring and evaluation in place which with additional resources, could be expanded to facilitate wider evaluation of the impact of infection prevention and control measures. Screening of patients for colonisation or infection with transmissible infection was performed in line with national guidelines.

The hospital had a suite of policies, procedures and guidelines and should continue to review and update the remaining documents. It is recommended that the Infection Prevention and Control Committee formalises the process in relation to reviewing and controlling policies, procedures and guidelines to ensure staff only have access to the most up to date version.

The hospital needs to continue to progress full compliance with all essential care bundle components as full compliance has shown improved patient outcomes the frequency of care bundle compliance audits should be determined by result performance.

Factors that increase the risk of transmission of infection such as poor hospital infrastructure, lack of isolation rooms with en-suite facilities, inadequate bed spacing in multi-occupancy rooms and the infrastructure and design of the High Dependency Unit and Coronary Care Unit needs to be addressed in the hospital site development plan going forward.

Overall the patient environment was generally clean in the areas inspected. However, it is recommended that patient equipment cleaning specifications and resources are revised and aligned to national minimum cleaning frequencies.

In order to meet modern day infection prevention and control and hospital infrastructural standards, the hospital needs to be supported both at group and national level to address deficiencies going forward. It is recommended that the hospital continues to assess and manage the impact of these factors and escalate accordingly as part of their on-going infection prevention and control programme.

4. References

1. Health Information and Quality Authority. National Standards for the prevention and control of healthcare-associated infections in acute healthcare services. Dublin: Health Information and Quality Authority; 2017. [Online]. Available from: <https://www.hiqa.ie/sites/default/files/2017-05/2017-HIQA-National-Standards-Healthcare-Association-Infections.pdf>
2. Health Information and Quality Authority. Guide to the monitoring programme undertaken against the National Standards for the prevention and control of healthcare-associated infections. Dublin: Health Information and Quality Authority; 2015. [Online]. Available from: <https://www.hiqa.ie/sites/default/files/2017-05/Guide-monitor-National-Standards-healthcare-associated-infections.pdf>
3. Health Service Executive. HSE National Framework for developing Policies, Procedures, Protocols and Guidelines (PPPGs). Health Service Executive; December 2016. [Online]. Available online from: <http://www.hse.ie/eng/about/Who/QID/Use-of-Improvement-Methods/nationalframeworkdevelopingpolicies/HSE-National-Framework-for-Developing-Policies-Procedures-Protocols-and-Guidelines-PPPGs-2016.pdf>
4. Royal College of Physicians of Ireland Clinical Advisory Group on Healthcare Associated Infections. *Guidelines for Hand Hygiene in Irish Healthcare Settings Update of 2005 Guidelines*. Dublin: Royal College of Physicians of Ireland/Health Service Executive; 2015. [Online]. Available online from: <https://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,15060,en.pdf>
5. Health Service Executive. Core infection prevention and control knowledge and skills. A framework document. Dublin: Health Service Executive; 2015. [Online]. Available online from: <https://www.hse.ie/eng/about/Who/QID/nationalsafetyprogrammes/HCAIAMR/CoreInfectionPreventionandControl.pdf>
6. Health Protection Surveillance Centre. *Prevention of Intravascular Catheter - related Infection in Ireland. Update of 2009 National Guidelines September 2014*. 2014. [Online]. Available online from: <http://www.hpsc.ie/AZ/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/IntravascularIVlines/Publications/File,14834,en.pdf>
7. Health Protection Surveillance Centre. *Guidelines for the Prevention of Catheter associated Urinary Tract Infection*. [Online]. Available online from: <http://www.hpsc.ie/A->

[Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,12913,en.pdf](#)

8. Health Protection Surveillance Centre. *Guidelines for the prevention of ventilator-associated pneumonia in adults in Ireland. SARI Working Group.* 2011. [Online].

Available online from: <http://www.hpsc.ie/A->

[Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,12530,en.pdf](#)

9. World Health Organization. Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Healthcare Facility Level. Geneva: World Health Organization; 2016. [Online]. Available online from: <http://www.who.int/gpsc/ipc-components/en/>

10. Zingg W, Holmes A, Dettenkofer M, Goetting T, Secci F, Clack L, et al. *Hospital organisation, management, and structure for prevention of health-care-associated infection: a systematic review and expert consensus.* Lancet Infect Dis. 2015;15(2):212-24.

11. Haley RW, Culver DH, White JW et al. *The efficacy of infection surveillance and control programs in preventing nosocomial infections in US hospitals.* American Journal of Epidemiology 1985; 121: 182–205.

12. SARI Working Group, Health Protection Surveillance Centre. Guidelines for the Prevention of Ventilator-associated Pneumonia in adults in Ireland. Dublin: Health Service Executive, Health Protection Surveillance Centre; 2011. [Online]. Available online from:

<https://www.hpsc.ie/AZ/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,12530,en.pdf>

13. Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) Subgroup. Guidelines for the prevention of catheter-associated urinary tract infection. Dublin: Health Protection Surveillance Centre; 2011. [Online]. Available online from:

<https://www.hpsc.ie/A->

[Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,12913,en.pdf](#)

14. Royal College of Physicians of Ireland. Prevention of Intravascular Catheter-related Infection in Ireland. Partial update of 2009 National Guidelines. 2014.

[Online]. Available online from: <http://www.hpsc.ie/A->

[Z/Hepatitis/GuidanceforRenalUnits/File,4115,en.pdf](#)

15. Centres for Disease Control (CDC), Healthcare Associated Infections (HAIs) Progress Report, US CDC, Atlanta, 2016. [Online]. Available online from: <https://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf>
16. Bärwolff S, Sohr D, Geffers C, et al. *Reduction of surgical site infections after Caesarean delivery using surveillance*. Journal of Hospital Infection, 2006; 64: 156–61. [Online]. Available online from: [http://www.journalofhospitalinfection.com/article/S0195-6701\(06\)00297-0/pd](http://www.journalofhospitalinfection.com/article/S0195-6701(06)00297-0/pd)
17. Royal College of Physicians of Ireland Clinical Advisory Group on Healthcare Associated Infections. *Guidelines for the prevention and control of multidrug resistant organisms (MDRO) excluding MRSA in the healthcare setting*. Dublin: Royal College of Physicians of Ireland/Health Service Executive; 2014. [Online]. Available online from: <http://www.hpsc.ie/az/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File,12922,en.pdf>
18. National Clinical Effectiveness Committee. *Prevention and Control Methicillin-Resistant Staphylococcus aureus (MRSA). National Clinical Guideline No.2*. Dublin: Department of Health; 2013. [Online]. Available online from: <http://www.hpsc.ie/az/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File,14478,en.pdf>
19. National Hospitals Office, Quality, Risk and Customer Care. HSE Cleaning Manual Acute Hospitals. Dublin: Health Service Executive; 2006. [Online]. Available online from: http://hse.ie/eng/services/publications/Hospitals/HSE_National_Cleaning_Standards_Manual.pdf
20. National Hospitals Office, Quality, Risk and Customer Care. HSE National Cleaning Manual Appendices. Health Service Executive; 2006. [Online]. Available online from: http://www.hse.ie/eng/services/publications/hospitals/HSE_National_Cleaning_Standards_Manual_Appendices.pdf
21. Department of Health, United Kingdom. Health Building Note 00-02 Critical care Units. Department of Health, United Kingdom, 2013. [Online]. Available online from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/147865/HBN_04-02_Final.pdf
22. Dolan SA, Meehan Arias K, Felizardo G, Barnes S, Kraska S, Patrick M, Bumstead A. APIC [Association for Professionals in Infection Control and Epidemiology] position paper: Safe injection, infusion and medication practices in health care. Washington,

DC: American Journal of Infection Control 2016; 44:750-7. [Online]. Available online from: [http://www.ajicjournal.org/article/S0196-6553\(16\)00283-2/pdf](http://www.ajicjournal.org/article/S0196-6553(16)00283-2/pdf)

23. Irish Statute Book. S.I. No. 135/2014 - European Union (Prevention of Sharps Injuries in the Healthcare Sector) Regulations 2014. [Online]. Available online from: <http://www.irishstatutebook.ie/eli/2014/si/135/made/en/print>

24. Fenelon L and Aspergillus Sub-committee of the Scientific Advisory Committee, National Disease Surveillance Centre. *National Guidelines for the Prevention of Nosocomial Invasive Aspergillosis During Construction/Renovation Activities*. Dublin: National Disease Surveillance Centre; 2002. [Online]. Available online from: <http://www.hpsc.ie/A-Z/Respiratory/Aspergillosis/Guidance/File,896,en.pdf>

25. O'Donnell J and Legionnaires' Disease Subcommittee, Health Protection Surveillance Centre. National Guidelines for the Control of Legionellosis in Ireland, 2009: Report of Legionnaires' Disease Subcommittee of the Scientific Advisory Committee. Dublin: Health Protection Surveillance Centre; 2009. [Online]. Available online from: <https://www.hpsc.ie/A-Z/Respiratory/Legionellosis/Publications/File,3936,en.pdf>

26. St. Michael's Hospital, Quality Improvement Plan 2016. St. Michael's Hospital, 2016. [Online]. Available online from: <http://www.stmichaels.ie/component/content/article/82-stmichaels-hospital/professionals/136-hiqa-quality-improvement.html>

27. The Health Service Executive. The Productive Ward. [Online]. Available online from: <http://www.hse.ie/productiveward>

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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