



**Health
Information
and Quality
Authority**

An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

Report of the unannounced inspection at University Hospital Waterford.

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: 05 September 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 University Hospital Waterford by Authorised Persons from HIQA; Aileen O' Brien, Noreen Flannelly-Kinsella, Emma Cooke and Shane Grogan. The inspection was carried out on 05 September 2017 between 09:30hrs and 18:15hrs.

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 Neonatal Unit.

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)
- Prevention and control of transmission of antimicrobial-resistant bacteria (Section 2.6.1)
- Safe injection practice (Section 2.6.2)
- Prevention of aspergillosis during dust-generating building, renovation and maintenance works (Section 2.6.3)

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 University Hospital Waterford

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

University Hospital Waterford is a statutory hospital owned and managed by the Health Service Executive (HSE) and is part of the South/South West Hospital Group governance structure.

The Infection Prevention and Control Team at University Hospital Waterford reported into the Infection Prevention and Control Committee. The Infection Prevention and Control Committee reported into University Hospital Waterford Safety and Quality Executive Steering Group along with 18 other hospital committees or working groups. The Safety and Quality Executive Steering Group reported into the Executive Management Board which included the General Manager and other senior hospital managers. The hospital governance structure included three clinical directorates for perioperative care, medicine and diagnostics. The General Manager was the person with overall accountability and responsibility for the hospital and reported to the South/South West Hospital Group Chief Executive Officer.

The Infection Prevention and Control Committee was chaired by the Deputy General Manager at the hospital and terms of reference stated that the committee met quarterly. Membership included the General Manager, members of the Infection Prevention and Control Team, the Chair of the Decontamination Group, the Director of Midwifery, the Chief Pharmacist, the manager of the hospital's sterile supply department, and the Patient Services Manager. Included in the committee's terms of reference were medical and a surgical clinical representative, however, this representation was not reflected in attendance at these committee meetings.

University Hospital Waterford had established several hospital committees through which to govern services. HIQA has previously identified through prior monitoring work that other hospitals have acted to address the challenges inherent in such an arrangement, through the rationalisation of the number of hospital committees

reporting into an oversight committee in order to strengthen governance arrangements.³

It was identified to inspectors that oversight of hospital building works and related infection prevention and control implications was not fully formalised at the hospital. This needs to be progressed so that there are defined and transparent arrangements for the oversight of all aspects of the prevention and control of healthcare-associated infection at the hospital.

Infection prevention and control and clinical microbiology service

The Infection Prevention and Control Team at University Hospital Waterford reported into the Infection Prevention and Control Committee on a quarterly basis.

The team was led by one whole time equivalent* (WTE) consultant microbiologist position based in University Hospital Waterford. This role was rotated among consultant microbiologists at the hospital every two years. Twenty four hour clinical microbiology advice was available by telephone to hospital staff and this was provided on a rotational basis by four consultant microbiologists, all based at University Hospital Waterford. The Microbiology Laboratory at the hospital was accredited by the Irish National Accreditation Board.

Consultant microbiologists at the hospital provided clinical microbiology advice and oversaw microbiology results in respect of five hospitals including University Hospital Waterford, Wexford General Hospital, South Tipperary General Hospital, St Luke's Hospital Kilkenny and Kilcreene Regional Orthopaedic Hospital. Management arrangements for provision of microbiology laboratory and related clinical services were not aligned to the current hospital group governance structure. University Hospital Waterford, South Tipperary General Hospital and Kilcreene Regional Orthopaedic Hospital were in the South/South West Hospital Group whereas Wexford General Hospital and St Luke's Hospital Kilkenny were both in the Ireland East Hospital Group. This was a legacy arrangement from the previous HSE South Eastern region configuration where these hospitals worked closely together and their laboratory information systems were linked.

The Infection Prevention and Control Team in University Hospital Waterford included three WTE infection prevention and control nurses which included an assistant director of nursing, a clinical nurse specialist and a clinical nurse manager 2.

* 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.

The team also included two surveillance scientists who in addition to University Hospital Waterford managed microbiological surveillance data for four other hospitals in the South East region namely Wexford General Hospital, South Tipperary General Hospital, St Luke's Hospital Kilkenny and Kilcreene Regional Orthopaedic Hospital. The Infection Prevention and Control Team did not have formally allocated administrative support.

The Infection Prevention and Control Team met weekly and reported and also presented detailed infection prevention and control team reports to the Infection Prevention and Control Committee on a quarterly basis.

Review of documentation and discussion with the Infection Prevention and Control Team showed that the team's workload in 2016 and 2017 included:

- alert organism[†] and alert condition surveillance
- providing advice in relation to the management of patients colonised or infected with transmissible organisms
- advising on the management of outbreaks of infection
- oversight of microbiological screening and advising on the management of contacts of patients with multidrug-resistant organisms
- providing advice in relation to building and renovation works
- providing advice in relation to new equipment
- staff education and policy development
- advice to hospital committees and working groups as required
- providing advice in relation to water supply issues.

The Infection Prevention and Control Team's workload had increased particularly in relation to the appropriate placement and management of patients with antimicrobial resistant organisms such as Carbapenemase-producing *Enterobacteriaceae*.[‡] This meant that the team had to reprioritise their workload. To address increasing service requirements the team had submitted a business case to management for administrative support and for two additional WTE infection prevention and control nurse positions.

Inspectors were informed that a formalised antimicrobial stewardship programme was not fully implemented at the hospital because an antimicrobial pharmacist was not in position at the hospital for a number of months. Antimicrobial stewardship was overseen by a consultant microbiologist at the hospital and this was supported

[†] Alert organisms are micro-organisms that pose a significant risk of transmission to non-infected patients or staff, resulting in colonisation or healthcare-associated infection, or that pose a significant risk of transmission to non-infected people in the wider population or community.

[‡] 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.

through clinical advice provided by consultant microbiologists in addition to up-to-date antimicrobial prescribing guidelines and prescriber education sessions. Hospital management reported that recruitment of an antimicrobial pharmacist was in progress.

Monitoring and evaluation

Hospital management monitored the following performance indicators in relation to the prevention and control of healthcare-associated infections in line with HSE national reporting requirements:

- hospital-acquired *Staphylococcus aureus* bloodstream infection
- hospital-acquired *Clostridium difficile* infection.

Hospital management also monitored performance in respect of the following indicators:

- median hospital total antimicrobial consumption
- alcohol hand rub consumption
- percentage compliance of hospital staff with the World Health Organisation 5 moments of hand hygiene
- mandatory hand hygiene uptake by current healthcare staff who interact with patients in the rolling 24 month period.

The Infection Prevention and Control Team also audited the usage of gloves by hospital staff to determine compliance with recommended practice.

Reports generated following quarterly infection prevention and control committee meetings were provided to hospital management in addition to reports of any outbreaks of infection at the hospital.

The Infection Prevention and Control Team performed daily and ongoing laboratory and ward based surveillance and provided advice on the management and isolation of patients with transmissible infections. The team sent monthly surveillance reports to the hospital management team. Data was presented with a breakdown of cases by clinical area in respect of:

- number of hospital-acquired *Staphylococcus aureus* bloodstream infections
- number of hospital-acquired *Clostridium difficile* infections
- multidrug-resistant organism surveillance
- infectious disease/infection surveillance.

Inspectors were informed that the hospital was not in a position to participate in the national point prevalence survey of hospital-acquired infections and antimicrobial use in 2017 due to work prioritisation within current resources.

Hospital management told inspectors that environmental hygiene standards were monitored fortnightly at the hospital by the Hospital Hygiene Services Team who also included members of the Infection Prevention and Control Team.

Complaints received from patients were referred to the Infection Prevention and Control Team if concerns around infection prevention and control were identified.

Inspectors were informed that hospital management, the Infection Prevention and Control Team and clinical directors were working to co-ordinate a clinician-led analysis of healthcare-associated infection key performance indicators.

There was a lack of clarity in relation to the types of infection prevention and control-related incidents that were reported to the national incident management system. A report reviewed by inspectors showed that staff at the hospital had reported a number of incidents relating to infection prevention and control over the past 12 months. However, this information was not presented in a format that could be used to inform opportunities for improvement at the hospital. It is recommended that requirements in relation to the reporting of incidents in this regard are clarified.

Hospital management should expand their oversight of healthcare-associated infection process and outcome measures to facilitate wider evaluation of the impact of infection prevention and control measures.

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 hospital's corporate risk register which included multiple risks relevant to the prevention and control of healthcare-associated infection at the hospital. Risks that had been included by hospital management in the corporate risk register included the following:

- inadequate isolation facilities across the hospital including but not limited to critical care areas
- overcrowding in the Emergency Department
- insufficient facilities and staff for the decontamination of equipment
- concerns around the risk of waterborne infections in high risk areas and around the risk of invasive aspergillosis during construction works
- difficulty in facilitating staff access to mandatory training
- inadequate maintenance of the hospital environment and replacement of patient equipment
- risk of harm to patients due to lack of full implementation of national screening guidelines for Carbapenemase-resistant *Enterobacteriaceae*
- risk of harm to patients due to need to replace air handling units in some operating theatres.

Evolving governance arrangements which included the roll out of a directorate structure were also featured in the risk register.

The risk register outlined the existing control measures enacted by the hospital to address current risks. Hospital managers told inspectors that the hospital had been supported by the HSE at national level to address deficiencies in respect of isolation facilities at the hospital. Building of a new five storey block was in progress at the hospital at the time of inspection. This would provide 72 single en-suite rooms and additional isolation facilities with specialised ventilation at the hospital. Hospital

management had also proactively worked to improve decontamination facilities at the hospital and a new central decontamination unit for surgical instruments was scheduled to open pending approval of extra staff positions by the HSE. Hospital management had requested funding from the HSE 'winter bed' initiative to provide a temporary modular unit with eight isolation rooms to provide additional isolation facilities in advance of the new building opening. Confirmation of this funding had not been received at the time of inspection. In addition, hospital management stated that a business case had been submitted to identify the additional resources required to fully implement the national screening guidelines for Carbapenemase-resistant *Enterobacteriaceae*.

Risks identified by the Infection Prevention and Control Team were included in a local area risk register and some but not all of these were reflected in the corporate risk register reviewed by inspectors. Other risks identified by the Infection Prevention and Control Team included the absence of an antimicrobial stewardship pharmacist, insufficient infection prevention and control team resources to provide the level of service required and lack of monitoring of some infection prevention and control outcome measures.

Inspectors reviewed minutes of the University Hospital Waterford Executive Steering Committee for Safety and Quality and the Infection Prevention and Control Committee and noted that incidents and risks relating to infection prevention and control were discussed. Additionally, the hospitals' top five risks were discussed at monthly performance management meetings.

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.⁴ The hospital had a suite of infection prevention and control policies. This comprised of policies which covered aspects of standard precautions, transmission-based precautions, outbreak management and aseptic non-touch technique. It was practice that hospital policies, procedures and guidelines in respect of infection prevention and control were ratified by hospital management on behalf of the Infection Prevention and Control Committee.

Updating policies was also the remit of a regional South East Infection Prevention and Control Committee which originated from a previous HSE South East Regional structure and included members of the hospital's Infection Prevention and Control Team. This committee did not form part of the formal governance structure of University Hospital Waterford. It was reported that a review of this arrangement was underway with plans to replace the regional structure with a group aligned to the present South/South West Hospital governance structure.

Inspectors noted that policies pertaining to the management of intravascular devices belonging to Cork University Maternity Hospital were in use in the Neonatal Unit. It is recommended that policies and procedures for clinical practice implemented at University Hospital Waterford be formally ratified by hospital management and that these are labelled appropriately.

Inspectors found that 11 out of 18 infection prevention and control policies were overdue for revision at the time of the inspection. Policies relating to invasive medical devices, the care and maintenance of central venous access devices and the insertion, care and maintenance of peripheral vascular catheters were out of date.

Infection prevention and control policies, procedures and guidelines were available to staff in electronic format on the hospital intranet. However, inspectors observed that out of date hard copies versions of these documents were available in one of the clinical areas inspected. It is recommended that out of date policies are removed from circulation so that the staff only have access to up-to-date versions of these documents.

During the inspection, it was noted that staff had some difficulty accessing documents 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 hospital policies, procedures and guidelines by staff.

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. Hand hygiene education was mandatory for all staff in University Hospital Waterford on a two yearly basis.

The Infection Prevention and Control Team provided training in relation to hand hygiene practice and infection control precautions and a defined monthly training schedule was made available to staff. Hand hygiene education was delivered through practical training by infection prevention and control nurses and link nurses.⁵ In addition staff had access to the HSE eLearning programme for hand hygiene and staff were encouraged to submit their certificate on completion of the online programme.

The Infection Prevention and Control Team provided 84 education and training sessions during the 12 month period of January to December 2016. Training was provided to a range of staff disciplines in areas such as standard and transmission-based precautions, hand hygiene, outbreak management workshops, aseptic non-touch technique, decontamination and Carbapenemase-resistant *Enterobacteriaceae* (CRE).

Accurate figures in respect of uptake of hand hygiene and infection prevention and control staff training across disciplines in the previous two years was not available at the time of inspection. It is recommended that a system to accurately capture this information is developed so that hospital management have oversight of staff training uptake. Documentation showed that medical staff attendance at hand hygiene training was poor. Hospital management was endeavouring to address this.

A 'clinical safety update' training programme had been implemented in addition to mandatory training in which quarterly updates were provided on infection prevention and control elements such as hand hygiene, standard and transmission-based precautions along with other clinical updates. Furthermore, the hospital had trained 40 staff known as clinical champions to carry out hand hygiene technique assessments at local level. Staff reported that some areas had carried out up to 20

⁵ Hospital staff who in addition to performing their own job support the Infection Prevention and Control Team to promote good practice in relation to infection prevention and control.

hand hygiene technique assessments per month and results were communicated to local area managers and the Infection Prevention and Control Team.

Inspectors were informed that 63% of staff in the Neonatal Unit and 50% of staff in the surgical ward inspected were up to date with two yearly 'clinical safety update' training in relation to infection prevention and control. The hospital was endeavouring to align infection prevention and control education for staff with responsibility for direct patient care to the national framework for such knowledge and skills.⁵

A competency-based training programme for nursing staff was provided in relation to intravenous cannulation. Infection prevention and control education was provided to student nurses during training and to non-consultant hospital doctors and hospital interns at induction and during 'grand rounds'.^{**}

In addition, education sessions were provided to patients, visitors and staff at patient partnership awareness days held at the hospital.

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

^{**} 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

2.5 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.

Neonatal Unit

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

Documentation reviewed showed that intravascular device sites were assessed hourly for signs of infection and that device insertion and removal dates could be recorded. Inspectors found that a number of forms were in use to record device care and observations. This could be reviewed and refined. Care bundles were not in place for intravascular devices in the unit. It is recommended that this should be progressed.

Rates of device-related infection were not prospectively quantified. Urinary catheters were infrequently used as was mechanical ventilation.

Surgical Ward

Inspectors were informed that care bundles in respect of peripheral vascular catheters had been implemented in most areas in the hospital. Monitoring compliance with care bundles is an important process measure for evaluation of catheter-related blood stream infection preventative programmes. Monthly compliance with care bundle implementation was audited in the surgical ward inspected and showed between 95% to 100% compliance from May to August 2017.

Care bundles in relation to central vascular catheters and urinary catheters were not in place at the hospital. This needs to be progressed. The hospital should continue

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

to build on the progress made to date in relation to care bundle implementation across the hospital.

Nursing and Midwifery HSE Quality Care Metrics introduced in University Hospital Waterford in 2014 recorded limited data in relation to elements of invasive device management.

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}

Surveillance of these types of healthcare-associated infections was not performed at University Hospital Waterford. HIQA acknowledges that currently this is the case in many public hospitals of similar size and activity level in Ireland. Implementation of healthcare-associated infection surveillance programmes requires dedicated resources and expertise. This needs to be progressed, particularly in larger acute hospitals.

The hospital did not have a policy in relation to the prevention of surgical site infection however guidelines were available for surgical antimicrobial prophylaxis. Such a policy should be developed based on best practice guidelines.^{17,18,19,20}

^{††} 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

It was reported that screening of patients for colonisation or infection with Meticillin-resistant *Staphylococcus Aureus* and Vancomycin-resistant *Enterococci* in the hospital was performed in line with national guidelines. Inspectors were told that screening of patients for Carbapenemase-producing *Enterobacteriaceae* was not aligned to the national guidelines and would require additional resources to support full implementation across the hospital.

Hospital isolation facilities

Patients with suspected or confirmed communicable infection should be placed in a suitable isolation room, single room or cohort area, in line with national guidelines.

On the day of inspection there were 406 inpatients at the hospital. Inspectors were informed that isolation precautions were indicated for 68 patients, of these 35 patients were isolated in single rooms and 33 were cohorted in isolation bays. Overall the hospital had 44 single en-suite rooms which showed that, similar to other acute hospitals, there were insufficient facilities to isolate patients with potentially transmissible infection in single room accommodation. The hospital had four rooms with specialised ventilation to accommodate patients with airborne infection as required.

'Trolley Watch'^{§§} data indicated that fourteen patients deemed as admitted but waiting for a hospital bed were accommodated on trolleys in the Emergency Department the day before this inspection. This means that there was insufficient capacity at the hospital to accommodate all admitted patients.

^{§§} Trolley watch figures are compiled by the Irish Nurses and Midwives Organisation to show the number of admitted patients in hospital who are accommodated on trolleys each day because of shortage of available hospital beds. Available at : <http://www.inmo.ie/6022>

Management of outbreaks of infection

Documentation reviewed showed that there had been six outbreaks of infection in the hospital in 2016. On the day of inspection control measures were in place to manage an outbreak of Carbapenemase-producing *Enterobacteriaceae*. The outbreak was confined to one ward. The occurrence of outbreaks of infection highlights the need for effective infection prevention and control precautions in addition to sufficient isolation facilities for patients with infection.

Inspectors looked at implementation of measures to prevent the spread of antimicrobial-resistant organisms in both of the clinical areas inspected. Findings within each unit are presented separately.

The Neonatal Unit

The Neonatal Unit was subdivided into a neonatal intensive care unit, a high-dependency unit and a special care baby unit. There were a total of eighteen cots in the unit, of which 10 cots were located in the area designated for intensive and high dependency care and a further eight cots were located in the special care baby unit. There was one isolation room with specialised ventilation facilities. In addition there were three single rooms with accommodation and en-suite facilities for parents of newborns in the unit. These rooms were used for potentially infectious newborns and a separate entrance into one of these single rooms meant that attending parents did not need to walk through the open plan area of the unit.

If there were insufficient isolation rooms to meet requirements to isolate potentially infectious newborns, staff said it was practice to accommodate newborns in an enclosed incubator rather than an open cot to decrease the risk of spreading infection to other babies in the unit. All newborns were screened on admission and weekly thereafter for transmissible microorganisms in line with best practice guidelines. The nursing record for neonates included an infection control care plan. Staff in the unit said that any positive microbiology results were communicated promptly to them so that they could initiate any control measures indicated in a timely manner.

The Neonatal Unit was of a modern design and had surfaces and finishes that facilitated effective cleaning. Overall the unit environment was generally clean and dust free. Patient equipment was generally clean with some exceptions which will be outlined in the safe injection practice section of this report. One cot mattress core was stained; mattresses should be checked on a regular basis and replaced as necessary.

Inspectors reviewed records of monthly environmental and patient equipment hygiene audits for the Neonatal Unit. Monthly environmental hygiene audit results

demonstrated over 95% compliance with desirable standards between January and August 2017.

Surgical Ward

There were 30 beds in the surgical ward and patient accommodation rooms included four single en-suite rooms and three en-suite multi-occupancy rooms with three, five or six beds. Thirty one patients were accommodated on the ward on the day of inspection. One patient was accommodated on a bed in the main ward corridor in line with the hospital's bed management escalation policy for busy periods. All patients with transmissible infection on the ward were appropriately accommodated in single rooms on the day of inspection.

Isolation facilities within the surgical ward were limited in that there were only four single rooms and only one of these had designated hand washing facilities for staff. This meant that three of these single rooms were not suitable for managing patients with some types of gastrointestinal infection.

Staff told inspectors that patient assessment in relation to transmissible infections was performed in the Emergency Department and on admission to the hospital. It was practice to highlight patients with known infection risk in the hospital's electronic information system in order to highlight accommodation needs and infection prevention and control and screening requirements. Nursing admission assessment and discharge forms also contained sections to facilitate appropriate identification, assessment and communication of infection control risks as appropriate.

On the day of inspection, opportunities for improvement were identified by inspectors in relation to patient equipment and environmental cleaning in this ward. Brown staining was visible on the under surface of a commode and a patient armchair. Stained sticky tape observed on a commode armrest which was in need of repair did not facilitate effective cleaning. These issues were highlighted and addressed at the time of inspection.

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 the bedside curtain and red stains were also present on the adjacent wall surface. These issues were addressed at time of the inspection. A number of alcohol gel dispensers in the ward were unclean.

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. This likely impacted on the frequency of cleaning of patient toilets, ancillary rooms and corridors.

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.²¹ It was reported that patient equipment was cleaned after use and also on a weekly rather than a daily basis. Cleaning checklists reviewed showed that weekly cleaning was not consistently performed and that periodic cleaning schedules were not aligned to 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.

Inspectors reviewed records of monthly environmental and patient equipment hygiene audits. Environmental hygiene audit results demonstrated 88% compliance for August 2017 and 86% to 90% compliance for June and July 2017 respectively.

Inspectors found that there was inappropriate storage of clean items and patient personal supplies in the 'dirty' utility room.^{***} This practice increases the risk of inadvertent contamination of clean supplies and could increase the risk of spreading infection. Patient personal supplies and cleaning supplies should be stored in a designated cleaning and storage room. There was no dedicated hand wash sink in this room.

The surgical ward did not have a dedicated room for the storage and management of cleaning equipment. The ward cleaning trolley and supplies were stored in a central location in the hospital. Ideally, hospital wards should have a designated cleaner's room equipped with a janitorial sink, hand washing facilities and space for cleaning equipment. Some opportunities for improvement in relation to general maintenance were also identified in the surgical ward inspected.

***Clostridium difficile* infection**

The hospital reported the rate of new cases of *Clostridium difficile* infection monthly to the HSE in line with national reporting requirements. Inspectors noted that the monthly reported rate of new cases of healthcare-associated *Clostridium difficile* infection at the hospital was higher than desirable in quarter one 2017. An outbreak report for March 2017 reviewed by inspectors showed that necessary control measures had been put in place and the outbreak was contained. The hospital had identified a need to have processes in place to identify and escalate issues in relation to malfunctioning bedpan washers following this outbreak.

^{***} 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.

The Infection Prevention and Control Team had recently introduced a *Clostridium difficile* infection trigger threshold of three new cases per month and were reviewing processes with clinical directorate teams in relation to performing root cause analyses for cases of *Clostridium difficile* infection. Such analysis is important from a learning and improvement perspective.

Effective antimicrobial stewardship programmes have been associated with reduced *Clostridium difficile* infection rates therefore full implementation of the antimicrobial stewardship programme at the hospital should be progressed as a matter of priority.

Additionally, on the background of persistently high activity levels and limited isolation facilities, the hospital needs to ensure that appropriate resources are made available for environmental and patient equipment cleaning aligned to national cleaning guidelines. *Clostridium difficile* infection can survive for long periods on environmental surfaces, a factor which contributes to transmission of infection in healthcare environments.

2.6.2 Safe injection practice

Inspectors reviewed elements of safe injection practice and implementation of aspects of standard precautions in both of the clinical areas inspected. Findings within each unit are presented separately.

Neonatal Unit

The medication for injection preparation area identified to inspectors was not designated solely for medication preparation as recommended. The medication preparation counter contained a blood glucose monitor. Blood glucose monitors should not be stored directly in a medication preparation area because of the potential risk of transmitting blood borne viruses or bacterial infection. Other items including blood testing tubes and a bilirubin meter were also inappropriately stored on this surface. One blood glucose monitor in the unit was stained. Blood glucose monitors should be cleaned after each use.

Inspectors observed red stains on a procedure tray used in the preparation of medication for injection which indicated that the tray was not cleaned effectively after use. It is an essential requirement that reusable procedure trays are effectively decontaminated after each use in order to reduce the risk of transmission of blood borne viruses or bacterial infection. The use of suitable disposable procedure trays should be implemented if non compliances are anticipated.

A mobile cart was sometimes used during the process of administering medication for injection at the point of care. This trolley contained open top drawers filled with multiple sterile supplies. It is recommended that supplies for multiple procedures are

not brought into the patient zone; trolleys brought into the patient zone should contain only the supplies needed for a single procedure. It is also recommended that sterile supplies are stored in fully enclosed containers or cupboards to avoid any potential risk of contamination.

A blood gas analyser was inappropriately located in the middle of the open plan neonatal intensive care unit. This unit was not occupied by patients at the time of inspection however the area was used to store patient equipment.

Safety devices had been introduced at the hospital to prevent needle stick injury to staff.²²

Surgical Ward

Staff who spoke with inspectors were able to describe recommended safe injection practices in the surgical ward inspected. Inspection of the clinical environment showed that there was good practice in relation to the storage and management of medication for injection. The surgical ward had a treatment room which had a clearly designated area for medication preparation. However, this room also contained a patient procedure chair, which staff said was only used occasionally. It is recommended that patient procedures are performed in a separate area and not in the designated area for medication for injection preparation and sterile supply storage in line with recommended guidelines.²³

Inspectors found opportunities for improvement in relation to the management of procedure trays used for intravenous medication. Two trays were unclean and there was a red stain on one of these. This was brought to the attention of staff who addressed this issue at the time of the inspection.

Multiple items in the treatment room in this ward were either dusty or unclean including a medication fridge, a medication dispensing trolley, a procedure chair, a portable chair weighing scales and storage units and worktop surfaces. Ancillary rooms such as treatment rooms should be included in the regular ward cleaning schedule.

Inspectors found that sterile supplies were stored in an open plan area behind a staff workstation. Sterile equipment should be stored in a designated clean supply storeroom or in fully enclosed units in order to limit the risk of inadvertent contamination of sterile items. Use of this space as an office and a clinical room is not appropriate and requires review.

2.6.3 Prevention of aspergillosis during dust-generating building, renovation and maintenance works

On the day of inspection, a hospital development project was in progress that involved the building of a new five storey ward block. Inspectors reviewed aspects of the prevention of invasive aspergillosis as construction work was underway.

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. 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 this refurbishment. The team were satisfied that recommended environmental controls were in place in line with national guidelines.²⁴ Patients at risk of infection were moved to a protective environment and windows were sealed to prevent the entrance of construction dust to clinical areas as required. Microbiological air sampling was performed by the Infection Prevention and Control Team during the works to assess the efficacy of the dust control measures in place. The hospital did not as yet have a policy for the prevention of aspergillosis during construction activities and in light of ongoing building works at the hospital, this should be progressed.

2.6.4 Other measures to prevent the transmission of infection

Hand hygiene

Essential components of the World Health Organisation (WHO) multimodal improvement strategy²⁵ were in place in University Hospital Waterford. The hospital had developed a hand hygiene strategy in 2017 which outlined the processes in place to achieve the HSE hand hygiene compliance target. The hospital participated in the national hand hygiene audits, the results of which are published twice a year. The hospital achieved 94% compliance in the national hand hygiene audit in May/June 2017 which is above the current required compliance target of 90% set by the HSE.

Inspectors reviewed records of the most recent hand hygiene audit results in the surgical ward inspected which showed that staff achieved 97% and 100% hand hygiene compliance in May and October 2016 respectively. The hospital should regularly review the frequency of local hand hygiene observational audits.²⁶ Over 95% of staff in the surgical ward had completed hand hygiene training in the previous two years.

⁺⁺⁺ 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.

Results of staff hand hygiene audits carried out in May 2017 in the Neonatal Unit showed that staff achieved 100% hand hygiene compliance. Inspectors were informed that 97% of staff in the Neonatal Unit had completed hand hygiene training in the previous two years.

Inspectors found that hand hygiene products located at clinical hand wash sinks in the Neonatal Unit did not clearly identify the product type. This finding was highlighted during a previous HIQA inspection at the hospital.

Prevention of waterborne infection

An issue in relation to pseudomonas bacteria in hand wash sink taps had been identified in the Neonatal Unit in January 2017. Documentation reviewed showed that hospital management had convened a multi-disciplinary team meeting to address this issue when it arose. Control measures had been implemented and staff in the Neonatal Unit were aware of these on the day of inspection. Enhanced infection prevention and control measures such as flushing programmes, water sampling, water filters and servicing and replacing taps in the unit had also been implemented to minimise the risk of infection to newborns in the Neonatal Unit.

The hospital undertook an independent legionella risk assessment in July 2017 and was awaiting the final report of this at the time of inspection. Hospital management reported that measures in relation to preventing waterborne infection and monitoring were implemented at the hospital including water temperature monitoring, chlorine dioxide dosing, routine flushing and water sampling schedules. Governance arrangements in respect of water management at the hospital were reported to be under review.

2.7 Quality improvement initiatives

Hospital management were asked to provide inspectors with information about any quality improvement initiatives that had been implemented in relation to the prevention and control of infection at the hospital. Quality improvement initiatives that had been implemented at the hospital included the following:

- The hospital participated in a health innovation and hygiene quality improvement research project which involved two orthopaedic wards. This included the introduction of impervious heat sealed pillows, interactive electronic hand hygiene training and an electronic hygiene auditing tool. This project included collaboration with another hospital and a research facility at University College Cork.
- A laboratory result book was introduced in hospital wards to improve communication of laboratory results to staff and to facilitate audit.
- Patient partnership forum campaigns were held on a quarterly basis to empower patients in relation to hand hygiene.
- Hospital cleaning specifications were reviewed.
- The hospital hosted an annual Quality Improvement Conference for staff in May 2017. A number of oral and poster presentations were presented by staff including the roll out of the national sepsis guideline and a poster presentation by hospital staff in relation to 'Carbapenem-resistant Enterobacteriaceae' (CRE) screening.
- Documentation provided by the hospital showed that University Hospital Waterford produced Nursing and Midwifery newsletters and 'Need2Know eBulletins' for staff which included information in relation to infection prevention and control education, relevant policies and reports on local quality improvement initiatives and service updates.

2.8 Progress since the previous HIQA inspection

HIQA reviewed the quality improvement plan²⁷ developed by the hospital following the 2015 HIQA inspection. Since the last inspection, the hospital had devised a hand hygiene strategy and held hand hygiene awareness days for staff and patients during the year.

The hospital had undertaken renovation projects in clinical areas since the last HIQA inspection which included the paediatric day ward and a cystic fibrosis gymnasium. A capital project involving a new five storey block building was in progress at the hospital at the time of inspection. This would provide 72 single en-suite rooms and additional isolation facilities with specialised ventilation at the hospital. A new central decontamination unit in the hospital was scheduled to open shortly.

A business plan to secure funding to address infrastructural and isolation deficiencies in the Intensive Care Unit had been submitted by the hospital to the South/South West Hospital Group and was awaiting approval. Additionally, minor capital funding had been requested to address deficiencies highlighted in HIQA's previous inspection in relation to the hospital's onsite facility used by external cleaning contractors for laundering reusable cleaning materials.

Funding in relation to a phased equipment replacement and maintenance programme had been secured and some equipment had been replaced. Two new medication fridges with digital temperature displays had been installed in the Intensive Care Unit. Additionally mobile cleaning trolleys throughout the hospital had been upgraded.

3. Conclusion

Overall, HIQA found through this inspection that the hospital had put in place some of the elements of an infection prevention and control programme. However, monitoring and evaluation of healthcare-associated infection processes and outcomes at the hospital was relatively limited, and could be expanded to facilitate wider evaluation of the impact of infection prevention and control measures. This could be achieved by advancing healthcare-associated infection surveillance and progressing with the implementation of patient screening programmes in line with national guidelines.

The hospital provided a microbiology service to five hospitals in two hospital groups including twenty four hour a day, seven day a week microbiological clinical advice. The hospital should review this process to be assured that the necessary resources are in place to deliver a safe sustainable service.

The hospital had systems in place to identify and manage risks in relation to the prevention and control of healthcare-associated infection. Collated information provided through incident reporting could be used more effectively to inform opportunities for improvement.

A combination of factors identified on the day of inspection, including insufficient bed capacity and overcrowding, insufficient isolation facilities, and poor hospital infrastructure in some inpatient clinical areas, increase the risk of transmission of infection. Many of these issues identified during this inspection are not unique to University Hospital Waterford. This is however, a concern, given that the hospital was experiencing an outbreak of Carbapenemase-producing *Enterobacteriaceae* in addition to other recent outbreaks of transmissible infection. Hospital management was working to address this risk and had recently submitted a business case identifying the resources required to implement the national requirements for the management of Carbapenemase-producing *Enterobacteriaceae*. The hospital was also in the process of building a new five storey block with single room patient accommodation at the time of inspection.

Care bundles should be consistently implemented in line with evidence-based best practice guidelines as full compliance with all essential care bundle components has shown improved patient outcomes. The hospital should progress with the implementation of care bundles across the hospital in line with national guidelines.

The hospital had demonstrated consistently high compliance results in national hand hygiene audits which was commendable. Policies, procedures and guidelines in relation to infection prevention and control should be updated in line with national guidelines and should be readily accessible for staff.

Hospital hygiene plays an important role in the prevention and control of healthcare-associated infection. In light of deficiencies identified in one area during this inspection, cleaning resources should be reviewed in particular in higher risk areas.

The hospital needs to formalise governance arrangements in relation to construction activity and water management at the hospital.

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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 multi-drug 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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