Health Information and Quality Authority

An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

Report of the unannounced inspection at

South Infirmary-Victoria University Hospital, Cork.

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 March 2018

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

In 2018 in light of the national public health emergency in relation to Carbapenemase Producing *Enterobacteriales*[*](CPE) the focus of these inspections will be on systems to detect, prevent and respond to healthcare-associated infections and multidrug-resistant organisms in line with national guidelines.

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 due course.

Information about this inspection

This inspection report was completed following an unannounced inspection carried out at South Infirmary-Victoria University Hospital by Authorised Persons from HIQA; Kay Sugrue and Kathryn Hanly. The inspection was carried out on 13 March 2018 between 09:04hrs and 15:30hrs.

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:

- an elective orthopaedic ward
- an orthopaedic trauma rehabilitation ward.

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

[*] Carbapenemase Producing Enterobacteriales (CPE), are Gram-negative bacteria that have acquired resistance to nearly all of the antibiotics that would have historically worked against them. They are therefore much more difficult to treat.

2. Findings at South Infirmary Victoria University Hospital

The following section of this report outlines the main findings of this inspection. The report is structured as follows:

- section 2.1 outlines the risk identified during this unannounced inspection
- section 2.2 to 2.7 presents the general findings of this unannounced inspection which are aligned to monitoring lines of enquiry.

2.1 Risk identified during this unannounced inspection

During an unannounced inspection by HIQA on 13 March 2018, a risk was identified at South Infirmary-Victoria University Hospital in relation to the prevention and control of healthcare-associated infection. Specifically, a risk was identified in relation to non-compliance with national screening guidelines in relation to CPE.[3]

It was reported to inspectors at the time of the inspection that all patients who were transferred from or had been inpatients in any other hospital in Ireland or elsewhere with the exception of hospitals in Cork and Kerry within the previous 12 months were screened. This exclusion criteria applied to Cork and Kerry hospitals by the South Infirmary-Victoria University Hospital was not in line with the national screening guidelines which are inclusive of all hospitals in Ireland. In addition, residents of long term care facilities were not routinely screened for CPE on admission. The extent of any potential challenges posed by CPE cannot be quantified in the absence of effective screening and surveillance and was of particular concern in the background of a National Public Health Emergency to address CPE.[†]

In light of the limited treatment options and substantial mortality associated with infections caused by CPE, prevention and control measures are of the utmost importance. Screening for CPE is considered an essential infection prevention and control strategy.

Considering this in the context of the activation of the National Public Health Emergency Plan to address CPE in our health system, HIQA sought assurance

[†] A public health emergency is described as any serious or unexpected event, due to an infectious disease, which causes, or threatens to cause, death or serious illness to large sections of the population, an individual region or a specific cohort of individuals and which will have a major impact on the normal functioning of the health system and on society in general.

regarding arrangements that are in place to ensure compliance with the national guidelines on screening[‡] for CPE at South Infirmary-Victoria University Hospital.

The inspection team noted that the hospital had identified this issue as an area of concern prior to this inspection. A risk assessment relating to the risk of a CPE outbreak at the hospital had been performed in September 2017. This assessment identified that additional controls relating to infrastructure and screening resources were required to fully mitigate the risk. Deficiencies in CPE screening for patients admitted to the hospital had been escalated and discussed at the following forums:

- Infection Prevention and Control Committee
- Clinical Governance (Quality and Safety) Committee
- South/Southwest Hospital Group Healthcare Associated Infections Committee.

A business case requesting additional resources required to support the full implementation of CPE screening guidelines was submitted by the hospital at hospital group level in quarter four of 2017 and again in the first quarter of 2018. Microbiology laboratory services for the South Infirmary-Victoria University Hospital are routinely provided by the Mercy University Hospital. As a consequence of the shared provision of microbiology laboratory services between the two hospitals, it was reported to inspectors that a separate business case seeking additional medical scientist resources was submitted to the South/Southwest Hospital Group (S/SWHG) by the Mercy University Hospital. The hospital highlighted the difficulty in complying with updated CPE screening requirements potentially placing a greater demand on microbiology laboratory and infection prevention and control services in the context of other competing screening requirements and existing demands on these services.

In its response to the high risk letter sent by HIQA to the South Infirmary Victoria University Hospital, the hospital communicated that the following actions had been taken which included:

- submission of business cases prior to this inspection to the S/SWHG seeking additional infection prevention and control, administrative and surveillance scientist resources to enable full compliance with CPE screening requirements.
- a repeat risk assessment at the hospital relating to the CPE risk and national screening requirements in light of a recent CPE outbreak which had occurred in a Cork Hospital in January 2018. This risk assessment was initially conducted in September 2017 and repeated in March 2018.

[‡] Performing active surveillance cultures, active screening tests or contact screening of at-risk patients to detect colonisation with Carbapenemase Producing Enterobacteriales.

- risk on CPE screening requirement now included on the hospital risk register following repeated risk assessment resulting in an increase in risk rating between the two risk assessments.

Despite a recent reported CPE outbreak in a local hospital, South Infirmary-Victoria University Hospital did not indicate if the exclusion criteria on CPE screening applied by the hospital had been broadened to include screening of all patients who were transferred from or had been inpatients in hospitals in Cork and Kerry. Continuing to exclude these hospitals in the context of the recent CPE outbreak is a significant concern and needs to be reviewed and addressed as a matter of urgency.

In addition, the risk relating to CPE screening requirements highlighted in the repeat risk assessment was aligned to nightingale-style wards[§] and not all clinical areas within the hospital. While acknowledging that the infrastructure of nightingale wards is suboptimal from an infection control perspective, limiting this risk to only these type of wards and not hospital wide is not recommended and therefore should be reviewed.

[§] A nightingale-style room consists of one long ward with a large number of beds arranged along the sides, without subdivision of the room into bays. From an infection prevention and control perspective, the higher number of patients accommodated in nightingale wards increases the risk of infection transmission, especially if beds are spaced too close together.

2.2 Governance

Line of enquiry

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

Governance arrangements for infection prevention and control

South Infirmary-Victoria University Hospital is a Model two[4] voluntary acute hospital, and a member of the South/South West Hospital Group[**]. The hospital is the regional centre for Ear, Nose and Throat (ENT), Dermatology, Elective Orthopaedic, Opthalmology (In Patient and Day Cases) and Chronic Pain services. In addition, South Infirmary-Victoria University Hospital is primarily an elective hospital with a particular concentration on day surgery, short length of stay and day of surgery admission.

The hospital had formalised governance arrangements and organisational structures with clear lines of accountability in place for the prevention and control of healthcare-associated infections.

An organisational diagram reviewed by inspectors showed that the Infection Prevention and Control Committee formally reported into the Clinical Governance (Quality and Safety) Committee, who in turn reported into the Executive Management Team and upwards to the Board of Management. The CEO of the hospital was a member of each of these committees.

The infection prevention and control programme was led by a consultant microbiologist, co-ordinated by the Infection Prevention and Control Committee, and delivered by a specialist multidisciplinary infection prevention and control team.

The Infection Prevention and Control Committee was chaired by a consultant microbiologist. This Committee provided oversight of the implementation of the infection prevention and control programme. Documentation viewed showed that the Infection Prevention and Control Committee meetings were well attended with a structured agenda and schedule and had met seven times in 2017.

[**] The South/Southwest Hospital Group comprises nine hospitals operating across the counties Cork, Kerry, Waterford, Tipperary and Kilkenny. This group is led by a Group Executive Officer with delegated authority to manage statutory hospitals within the group under the Health Act 2004.

The consultant microbiologist position was a joint appointment for South Infirmary-Victoria University Hospital and the Mercy University Hospital. The Consultant Microbiologist had a 0.3 whole time equivalent commitment (WTE)[††] to the South Infirmary-Victoria University Hospital and was based in the Mercy University Hospital. Inspectors were informed that clinical staff had access to consultant microbiologist advice by telephone twenty four hours a day, seven days a week, in line with National Standards. The hospital had 1.5 (WTE) Infection Prevention and Control Nurses.

The hospital had access to a surveillance scientist service based in the Mercy University Hospital. In addition, a surveillance scientist was onsite in the South Infirmary-Victoria University Hospital one day a month collating surveillance data and quarterly surveillance reports.

The Hospital Hygiene Team was responsible for oversight and operational management of hospital hygiene. This team was multidisciplinary, was chaired by a hygiene co-ordinator and reported to the Infection Prevention and Control Committee.

Monitoring and evaluation

South Infirmary-Victoria University Hospital monitored the following national mandated performance indicators in relation to the prevention and control of healthcare-associated infection in line with HSE reporting requirements:

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

Data from the *Clostridium difficile* surveillance report 2017 showed an overall increase in the incidence of *Clostridium difficile* infection in the last year when compared with previous year's data. Inspectors were informed that root cause analysis was routinely performed at the hospital in respect of all hospital acquired *Clostridium difficile* infections.

Data relating to the above was included in the South/Southwest Hospital Group Quality and Safety Report and discussed at the Clinical Governance (Quality and Safety) Committee.

The hospital also submitted the following data on additional CPE performance indicators to the HSE Acute Business Intelligence Unit:

[††] 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

- new cases of Carbapenemase Producing *Enterobacteriales (CPE)*[‡‡]
- number of samples tested for CPE each week
- number of in-patients with CPE who were accommodated in unsuitable accommodation for any part of their admission
- evidence of cross transmission of CPE within the hospital
- number of grams of meropenem[§§] issued from pharmacy each week.

The Infection Prevention and Control Team informed inspectors that targeted surveillance on alert organisms[***] and conditions[†††] was routinely carried out at the hospital. The surveillance scientist produced surveillance reports on a quarterly basis which were presented to the Infection Prevention and Control Committee and to the Executive Management Board.

Other locally agreed performance indicators for 2017 outlined in the 2016 Infection Prevention and Control Report included:

- compliance with hand hygiene training to increase by 20% in 2017
- compliance with national hand hygiene audit target to be maintained above 90%
- hospital-acquired *Staphylococcus aureus* bloodstream infection and hospital-acquired *Clostridium difficile* to be maintained below the national rate
- peripheral vascular catheter and urinary catheter care bundles to be reviewed in all inpatient areas on a quarterly basis.

Documentation viewed showed that hospital performance indicators were reviewed and updated annually. Completion of system analysis on all healthcare-associated MRSA occurrences and performing 50% more infection prevention and control audits were added to 2017 performance indicators while quarterly review of selected care bundles in all inpatient areas was removed. Compliance with new 2017 performance indicators was evident in documentation viewed by inspectors at the time of the inspection.

[‡‡] 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.

[§§] Meropenem is a broad spectrum antimicrobial agent belonging to a class of antimicrobials known as carbapenems. It may be used to treat a wide range of infection types however treatment options are very limited for Gram-negative organisms resistant to meropenem. Greater use of meropenem has begun to see limited instances of the emergence of resistance to this drug — some strains of Gram-negative bacteria have evolved to produce chemicals which disable meropenem and other carbapenem antimicrobials from working. These chemicals are known as carbapenemases. Treatment options for carbapenemase producing bacteria (CPE) are limited to a handful of antimicrobial choices which are often less effective than meropenem, and sometimes more toxic.

*** alert organisms included MRSA, extended spectrum beta lactamases(ESBL), vancomycin resistant enterococcus (VRE) and other multi drug resistant organisms (MDROs).

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

The inspection team noted that CPE was not included in 2018 performance indicators in the draft infection prevention and control plan but was under consideration for inclusion at the time of the inspection. Additional annual performance indicators were also in place for Hygiene Services.

The hospital had participated in previous national point prevalence surveys of hospital-acquired infections and antimicrobial use including the 2017 survey. Antimicrobial consumption was monitored locally which included trending of main antibiotic, selected antibiotic, restricted antibiotic usage and antibiotics used in the treatment of urinary tract infections. Data of antimicrobial consumption at the hospital was presented in an annual report.

A number of audits relating to the prevention and control of healthcare-associated infection and practices were conducted by the Infection Prevention and Control Team and these included the following audits:

- point of care equipment
- hygiene walkabouts
- environmental
- linen management
- waste management
- patient mattresses
- 'dirty'[‡‡‡] utility rooms
- hand hygiene facilities
- hand hygiene practices
- water flushing.

Data in respect of legionella water test results and local audit findings were also presented at the hospital Infection Prevention and Control Committee meetings.

Findings in regard to hand hygiene, hospital hygiene audits and ongoing surveillance of key multidrug-resistant organisms monitored at the hospital will be presented in section 2.7 of this report.

[‡‡‡] 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.

2.3 Risk management

Line of enquiry

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

The South Infirmary-Victoria University Hospital had systems in place to identify and manage risk in relation to the prevention and control of healthcare-associated infections. A corporate risk register[§§§] was maintained by hospital management and viewed by the inspection team. Risks in relation to infection prevention and control included dated hospital infrastructure and limited isolation facilities, theatre infrastructure and an issue relating to lost laboratory specimens.

Minutes of meetings were reviewed by inspectors which demonstrated that infection prevention and control incident reports were submitted and discussed at Clinical Governance (Quality and Safety) Committee meetings and the Infection Prevention and Control Committee as standing agenda items. The hospital risk manager and CEO were members of both of these committees ensuring communication of relevant information at appropriate levels within the hospital.

Inspectors were informed that risk assessments were carried out following identification of issues relating to infection prevention and control as required. An example of this was the CPE risk assessment performed in September 2017 and repeated in March 2018. Inspectors were informed that risks which could not be effectively mitigated at a local hospital level were escalated to the Hospital's Group through its reporting structures.

[§§§] 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.

2.4 Policies, procedures and guidelines

Line of enquiry

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.[5] Documentation reviewed by inspectors showed that the review cycle for local policies, procedures and guidelines varied between two and three years. Infection prevention and control policies, procedures and guidelines were developed by the Infection Prevention and Control Team and approved by the Clinical Governance (Quality and Safety) Committee.

Documents were available on an electronic document management system to facilitate document version control and access to staff across the hospital. Inspectors found that these documents were readily accessible to staff in the clinical areas inspected. However, inspectors found that five of the 16 infection prevention and control policies viewed needed to be updated, some of which were in the final draft stage waiting approval. Inspectors were informed that in some cases, national guidelines such as MRSA guidelines were adopted for local use by the hospital in the interim of updating policies, procedures and guidelines.

2.5 Staff training and education

Line of enquiry

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

Infection prevention and control education

Infection prevention and control education and training are essential to ensure that staff have the knowledge, skills and training required to consistently implement effective infection prevention and control practices. General infection prevention and control education was mandatory for relevant hospital staff at induction but was not mandatory thereafter.

Documentation viewed showed that multiple infection prevention and control education sessions were provided in 2016 and 2017. Content included but was not limited to training in relation to:

- annual infection prevention control study day (open to all staff)
- standard and transmission based precautions
- care bundles
- legionella and aspergillus management
- surgical site infections
- intern tutorials on infection prevention control practices
- updates on policies and procedure changes.

An infection prevention control link nurse programme was in place facilitating face-to-face ward-based education sessions on a more informal basis. In addition, infection prevention and control training presentations were accessible online to staff on ward desktop computers. Infection prevention and control training records were not available to view in the clinical areas inspected during the inspection.

Education sessions on standard precautions such as the management of equipment, sharps, waste and linen were provided to cleaning staff on a regular basis by the hygiene coordinator in 2017. Good levels of attendance at these education sessions was demonstrated in records viewed. In addition, the hygiene co-ordinator also delivered four training sessions as part of induction to junior doctors in 2017. HIQA found that there was scope for improvement in increasing staff awareness on CPE and should be considered an area of focus going forward in education and training provided.

Hand hygiene training

Inspectors were informed that hand hygiene training was mandatory for staff at induction and every two years thereafter in line with national hand hygiene guidelines.[6] Compliance with hand hygiene training was a hospital infection prevention and control performance indicator for the last number of years with the aim of improving attendance hospital wide.

The hospital had a hand hygiene champion programme in place which aimed to provide hand hygiene training and carry out hand hygiene audits locally. Training also comprised both eLearning training programmes and formal sessions.

Hand hygiene training records provided by the hospital showed that 77% of staff were up to date with hand hygiene training at the time of the inspection. At the time of inspection a high percentage of staff on both areas inspected had attended hand hygiene in the previous two year period.

2.6 Implementation of evidence-based best practice

Line of enquiry

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.

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[7,8,] published in recent years recommending their introduction across the Irish health system. Care bundles for urinary catheter care and peripheral vascular catheter care had been implemented in both areas inspected in line with national guidelines.

Monitoring compliance with care bundles are important process measures for evaluation of catheter-related blood stream infection preventative programmes. Evidence indicates that full compliance with all essential care bundle components improve patient outcomes. Care bundle audit results reviewed from March, May and September 2017 showed a consistent high compliance with hospital urinary catheter care bundle implementation in all clinical areas. However, potential scope for improvement in the management of peripheral vascular catheters devices was demonstrated in peripheral vascular care bundle audit results viewed by inspectors for 2017. Less than desirable compliance with peripheral vascular care bundle audit results demonstrates the need for ongoing audit followed by targeted training and education to ensure compliance with the peripheral vascular catheter care bundles.

Surveillance of invasive-device related and surgical site infection

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.[9,10,11] 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.[12,13]

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

Surveillance of invasive device related types of healthcare-associated infections was not performed at South Infirmary-Victoria University Hospital. 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.

Surveillance of surgical site infection

Surgical site infection surveillance represents good practice and demonstrates a commitment to monitoring the quality of patient care and is an important patient safety and quality assurance initiative.

The hospital had originally submitted a business case for the initiation of a formal surgical site surveillance programme in 2015. Hospital management explained to inspectors that little progress with that regard had been made up until recently. However, the inspection team was informed that funding had been provided from the Nursing and Midwifery Practice Development Unit for the introduction of surgical site surveillance and care bundles at the hospital. A surgical site surveillance nurse was due to commence in this role in the near future which should facilitate the implementation of a formal surgical site surveillance programme at the hospital. This is a positive progressive step and demonstrated a commitment by the hospital to monitoring the quality of surgical care provided to patients in this elective setting.

2.7 Prevention and control of multidrug-resistant bacteria

Line of enquiry

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

2.7.1 Hospital systems to prevent and control multidrug-resistant organisms

Inspectors looked at implementation of aspects of standard and transmission-based precautions to assess the detection, prevention, control and management of transmission of multidrug-resistant bacteria at the hospital.

Microbiological screening and surveillance of multidrug-resistant bacteria

Inspectors were informed that patient assessment to determine previous colonisation or infection with a transmissible microorganism was undertaken in the Pre assessment Clinic prior to admission to the ward. Screening of patients for colonisation or infection with MRSA was performed in the Pre assessment Clinic for in line with national guidelines.[14] A full MRSA screen was completed for all elective patients undergoing joint replacement surgery. A urine specimen was also requested for culture. Surgeries other than joint replacement procedures required a nasal MRSA screen. The pre assessment record included a designated section on infection control and facilitated recording of information such as a history of colonisation with multi-drug resistant organisms and any gastrointestinal or respiratory illness suggestive of infection.

The hospital facilitated telephone pre-assessment for some patients prior to admission. This was based on pre determined criteria. There was an option for patients who were deemed suitable to have MRSA screening by post. Inspectors were informed that the introduction of postal screening was a quality improvement initiative and this process was validated prior to its implementation. A demonstration video and supporting patient information leaflets were accessible to patients on the hospital website. Pre-admission screens performed at the hospital were deemed valid for a period of three months. Weekly MRSA screens were performed for patients in hospital for longer than seven days.

Hospital-wide targeted surveillance of alert organisms was performed by members of the Infection Prevention and Control Team. The infection prevention and control team attended bed management meetings in the hospital so that appropriate

accommodation could be arranged for elective patient admissions. The hospital had a computerised patient information management system to identify patients previously colonised or infected with antimicrobial resistant bacteria. A green flag alert was used to identify these patients on this system.

As the services provided at the hospital are elective in nature, proactive management of patient infection prevention and control status prior to admission was a primary role for the infection prevention and control team. This included weekly and daily monitoring of the hospital electronic patient information system to ensure the correct placement of patients on admission. Advice on isolation precautions required for individual patients was provided to each clinical area at the beginning of the week and as required thereafter. Ward rounds were carried out by a member of the infection prevention and control team on a weekly basis. However, proactive screening for multi-drug resistant organisms other than MRSA was not routinely performed as part of pre-admission assessment at the time of this inspection. Therefore there was potential to miss the identification of patients previously colonised or infected with a multi-drug resistant organism from another healthcare setting.

The infection control team monitored the burden of MRSA and other multidrug-resistant organisms including *clostridium difficile* on a quarterly basis. This surveillance quantified the total number of patients with each resistant organism managed, the number of newly diagnosed cases identified at the hospital and the total number of probable hospital-acquired cases. This information was presented and discussed at Infection Prevention And Control Committee meetings.

Where patients were identified with a specific transmissible organism, relevant patient information leaflets were provided to patients. The Infection Prevention and Control Team provided advice in relation to control measures.

Hospital isolation facilities

It is important that the physical healthcare infrastructure minimises the spread of healthcare-associated infections, including multidrug-resistant organisms.[15] Patients with suspected or confirmed communicable disease including healthcare-associated infection and multidrug-resistant organisms should be placed in a suitable single isolation room in line with national guidelines.[16,17]

Dated hospital infrastructure has been an identified challenge at the hospital for many years which has the potential to increase the risk of transmission of healthcare-associated infection to inpatients. This issue has also been identified by HIQA during previous inspections and remained unresolved.[18,19,20,21]

Inspectors were informed that there was a total of 192 beds in the hospital, 92 of which were inpatient beds. On the day of the inspection, the hospital had limited

isolation facilities which included 38 single rooms, 36 of which had ensuite facilities. The lack of adequate isolation facilities was further compounded by the existence of two nightingale style wards which by their open plan structure do not effectively support infection prevention and control practices. At the time of the inspection, all patients requiring isolation facilities were accommodated in single rooms in both areas inspected.

HIQA found that the hospital had worked to address maintenance and infrastructural issues through minor capital funding. The inspection team was informed that minor capital funding had been cut by 50% for 2018 which has potential to severely impact on the hospital's ability to continue to improve the hospital infrastructure.

Hand hygiene

Essential components of the World Health Organisation (WHO) multimodal hand hygiene strategy were evident in South Infirmary-Victoria University Hospital. The hospital participated in national hand hygiene audits, the results of which are published twice a year. Maintaining national hand hygiene compliance above 90% was a key performance indicator at the hospital for 2017 which was successfully achieved.

Regular local hand hygiene audits were performed and trended. It was reported that clinical areas achieving less than 90% compliance were generally reaudited within three weeks. However documentation reviewed indicated that reaudits were not always undertaken. Results of audits undertaken from January to October 2017 showed that the rehabilitation ward inspected achieved less than 90% compliance in four out of the five audits performed. A reaudit of hand hygiene practice was not evident for August 2017. However, compliance with hand hygiene practice had improved to 93.3% in January 2018. Hand hygiene audit results for the surgical ward inspected showed above 90% compliance rate with hand hygiene practice in audits carried out for the same period in 2017.

Trended hospital wide hand hygiene audit results were circulated to clinical areas and reported Hospital Management.

Environmental and Equipment Hygiene

Overall, patient areas and equipment of areas inspected were generally clean and well maintained with some exceptions. Inspectors found that some improvements were required in management of patient equipment in both areas inspected. Cleaning specifications were in place which clearly identified environmental surfaces and fixtures to be cleaned, the required frequency of cleaning and the staff discipline responsible in line with national cleaning guidelines.[22]

The inspection team was informed that a multidisciplinary infection prevention and control audit group was formed at the hospital in 2015. This group was tasked with performing audits relating to various elements of infection prevention and control including but not limited to point of care audits, linen and waste management and water flushing audits. Audits were scheduled based on risks where higher risk areas were audited quarterly and areas presenting as a lower risk were assessed twice a year. In total, 27 of these audits were completed in 2017. This represented a significant increase in the number of audits conducted in 2016. Additionally, hospital walkabouts were also carried out by members of the hospital management team. Quality improvement plans were developed following these audits and walkabouts. Trended audit results were circulated to clinical areas, reported at senior management level and included in a comprehensive end of year Hospital Hygiene Report.

It was reported that infrastructural issues had impacted on the overall compliance rate in environmental hygiene audits. To address this issue, audit tools were revised to capture point of care equipment hygiene which ensured issues relating to ongoing infrastructural and maintenance deficiencies did not negatively impact hygiene audit scores. In addition, target compliance levels for hygiene audits were reduced from 85% to 80%. Clinical areas not achieving desirable compliance levels were reaudited within three weeks. Documentation viewed showed that the hospital was committed to improving hospital wide hygiene standards, however results of audits viewed showed that scope for improvement was evident in the hospital wide compliance achieved.

Management of outbreaks

Documentation viewed showed that the hospital had processes in place to manage, report and learn from outbreak situations.

2.7.2 Prevention and control of multidrug-resistant organisms in clinical areas inspected

Systems and measures to prevent the spread of multidrug-resistant organisms were reviewed in both clinical areas inspected.

Elective Orthopaedic Ward

The ward could accommodate 14 patients and included two three-bedded rooms and eight spacious single rooms. All patient rooms on the ward had access to en-suite toilet facilities which was beneficial from an infection prevention and control perspective.

On the day of inspection, one patient, requiring transmission-based precautions was accommodated in single room, as appropriate. Signage to communicate isolation precautions was in place. However, inspectors observed that doors to these isolation rooms were open throughout the inspection. Isolation room doors should be kept closed as far as possible; otherwise a risk assessment should be performed. A clinical waste bin was also inappropriately positioned outside the isolation room. Staff informed inspectors that dedicated equipment was not allocated to patients in isolation. The hospital should ensure that dedicated patient equipment for which transmission-based precautions were indicated is available so as to avoid transmission of infection.

Infrastructure

Overall, environmental surfaces inspected in the ward were visibly clean. However, a number of infrastructural and maintenance issues were identified during the course of the inspection which had the potential to impact on infection prevention and control measures such as:

- less than optimal configuration and design of the ward which was not self-contained
- clean utility room was not located on the main ward
- separation of clean and dirty activities not facilitated in layout of the 'dirty' utility room[††††]
- several worn and poorly maintained surfaces
- inadequate storage and maintenance of cleaning equipment
- unsecured access to an unused dilapidated room at the entrance of the ward. This was addressed immediately on the day of inspection.

[††††] 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.

Equipment

Opportunities for improvement were also identified in relation to the management and monitoring of frequently used patient equipment. A number of items of patient equipment were either stained or dusty such as a wedge pillow, an intravenous infusion pump and a tympanic thermometer. Point of care equipment audit scores varied between 61% in May 2017 to 78% in July 2017 to 68% in February 2018 and showed that compliance with desirable standards were not consistently greater than 80%.

The ward had a system in place to identify patient equipment that had been cleaned, however, this system had not been consistently applied at the time of inspection. Such a finding does not provide assurance that all equipment was cleaned completely on a daily basis in line with local cleaning schedules. HIQA recommends that the hospital review the mechanisms in place to assure itself that patient equipment is managed to minimise the risk of patients acquiring a healthcare associated infection.

There was poor awareness relating to audit feedback and performance information at the time of the inspection. Feedback is an important means to raise awareness on deficits in good hygiene practices and to acknowledge the results achieved.

Orthopaedic Trauma Rehabilitation Ward

This ward could accommodate 16 patients and included three two-bedded, one four-bedded, one three bedded and three single rooms. Two of the single rooms had ensuite facilities which were used mainly for isolation purposes. The third single room without ensuite facilities was only used as an isolation room as a last resort. All patient rooms on the ward had access to en-suite toilet facilities which was beneficial from an infection prevention and control perspective. Inspectors were informed that it is planned to extend the capacity on the ward to 18 beds in the near future. Any permanent increase in capacity should only be considered in the context of compliance with national guidelines and standards.

Overall, the ward was generally clean with a few exceptions at the time of the inspection. An improvement in the management of patient equipment was required. This was also reflected in the results of the point of care audits viewed by inspectors.

3. Progress since the previous HIQA inspection

HIQA reviewed the quality improvement plan published by South Infirmary-Victoria University Hospital following the 2016 inspection. It was apparent that the hospital was endeavouring to address the issues previously identified in the unannounced inspection. The quality improvement plan showed that 17 of the 30 actions identified in the quality improvement plan had been fully addressed. Many of the remaining actions were subject to funding approval and were related to maintenance and infrastructural issues.

A risk assessment for the prevention and control of *legionella* was last carried out at the hospital in 2013. However, the inspection team were informed that a *legionella* risk assessment was had commenced on 8 March 2018. Inspectors were informed that necessary measures in relation to water-borne infection were implemented including regular outlet flushing and microbiological testing of water.

South Infirmary-Victoria University Hospital as a member of the South/South West Hospital Group needs to be supported within the group structure to better address issues in relation ward infrastructure, in order to facilitate compliance with the National Standards.

4. Conclusion

A National Public Health Emergency Plan was activated on 25 October 2017 by the Minister for Health in response to the increase and spread of CPE in Ireland. Identification of colonised patients, by screening patients who meet the criteria in the national screening guidelines, on entry to hospital is a critical measure required to identify those patients who are colonised with CPE. Early identification can prevent further transmission to other patients. The Health Service Executive introduced national screening guidelines for the acute hospital sector in June 2017. Inspectors found that South Infirmary-Victoria University Hospital had not successfully ensured that screening patients for CPE was fully embedded in the hospital. In light of the current national public health emergency and a recent CPE outbreak experienced in another Cork hospital, HIQA considered this to be a high risk that required escalation to hospital management following this inspection. CPE screening criteria applied locally by the hospital which was limited to screening patients in nightingale style wards only and excluded patients who were transferred from or had been inpatients in hospitals in Cork and Kerry were of significant concern to HIQA.

Despite the commitment shown by the hospital on the day of the inspection towards compliance with CPE national screening requirements, inspectors were informed that at a minimum, this could only be achieved with additional medical scientist laboratory resources. The hospital's response to the risk identified following the inspection did not provide sufficient assurance that compliance with the latest national CPE screening requirements will be met in the immediate future. Reliance on additional resources to process samples resulting from enhanced screening requirements is a potential barrier to full compliance with national CPE screening requirements.

Surveillance of CPE can help to provide a clearer picture of the problem posed and lead to effective management, containment and oversight of this resistant bacteria; the ultimate aim of which is to protect patients. It is therefore imperative that hospitals are sufficiently resourced and supported with their hospital groups and at national level to achieve full compliance with national CPE screening requirements and the National Standards.

South Infirmary-Victoria University Hospital had infection prevention and control governance structures and systems in place to identify and manage risks in relation to the prevention and control of healthcare-associated infection. However, HIQA notes that infrastructural deficiencies and limited space at the hospital continues to present ongoing challenges with a potential to impact on the effective implementation of infection control practices.

Notwithstanding this, the hospital had continued to revise and strengthen local infection prevention and control arrangements since the last HIQA inspection in 2016. Examples of progress to date related to increased monitoring of hospital hygiene by 100% between 2016 and 2017, maintaining hand hygiene compliance above 90% and the introduction of a postal screening option for pre-assessment of patients by telephone prior to admission. However, there was scope for further improvement in the compliance achieved hospital wide in point of care audits and peripheral intravascular care bundle audits.

5. 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 online 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 online from: https://www.hiqa.ie/sites/default/files/2017-05/Guide-monitor-National-Standards-healthcare-associated-infections.pdf

3. Health Service Executive. Requirements for screening of Patients for Carbapenemase Producing *Enterobacteriaceae* (CPE) in the Acute Hospital Sector. February 2018. Available online from: http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/strategyforthecontrolofantimicrobialresistanceinirelandsari/carbapenemresistantenterobacteriaceaecre/guidanceandpublications/

4.Health Service Executive. Report of the National Acute Medicine Programme 2010.Health Service Executive 2010. Available online from: http://www.hse.ie/eng/about/Who/clinical/natclinprog/acutemedicineprogramme/report.pdf.

5. Health Service Executive. HSE National Framework for developing Policies, Procedures, Protocols and Guidelines (PPPGs). Health Service Executive; December 2016. 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

6. 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. Available online from: https://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,15060,en.pdf

7. Health Protection Surveillance Centre. *Prevention of Intravascular Catheter - related Infection in Ireland. Update of 2009 National Guidelines September 2014.* 2014 Available online from: http://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/IntravascularIVlines/Publications/File,14834,en.pdf

8. Health Protection Surveillance Centre. *Guidelines for the Prevention of Catheter associated Urinary Tract Infection.* Available online from: http://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,12913,en.pdf

9. 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/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,12530,en.pdf

10. 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

11. 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

12. 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

13. 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: http://www.journalofhospitalinfection.com/article/S0195-6701 (06)00297-0/pdf

14. National Clinical Effectiveness Committee. Prevention and Control Methicillin-Resistant Staphylococcus aureus (MRSA). National Clinical Guideline No.2. Dublin: Department of Health; 2013. Available online from: http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File,14478,en.pdf

15. Department of Health, United Kingdom. Health Building Note 00-09: Infection control in the built environment. [Online]. Available online from: http://www.dhsspsni.gov.uk/hbn_00-09_pdf

16. 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

17. 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/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File,14478,en.pdf

18. Health Information and Quality Authority. *Report of the unannounced monitoring assessment at South Infirmary Victoria University Hospital*. Health Information and Quality Authority; 2013. [Online]. Available online from: https://www.hiqa.ie/system/files?file=inspectionreports/South-Infirmary-Victoria-Univeristy-Hospital-23.05.2013.pdf

19. Health Information and Quality Authority*. Report of the unannounced inspection at South Infirmary Victoria University Hospital, Cork*. Health Information and Quality Authority; 2014. [Online]. Available online from: https://www.hiqa.ie/system/files?file=inspectionreports/Report_Unannounced_SIVUH.pdf.

20. Health Information and Quality Authority*. Report of inspections at the South Infirmary-Victoria University Hospital, 16 April and 21 May 2015.* Health Information and Quality Authority; 2015. [Online]. Available online from: https://www.hiqa.ie/system/files?file=inspectionreports/SIVUH-21.05.2015.pdf

21. Health Information and Quality Authority. *Report of the unannounced inspection at the South Infirmary-Victoria University Hospital, Cork*. Health Information and Quality Authority; 2016. [Online]. Available online from: https://www.hiqa.ie/system/files?file=inspectionreports/Report_Unannounced_South%20Infirmary%20Victoria%20University%20Hospital.pdf.

22. National Hospitals Office, Quality, Risk and Customer Care. HSE National Cleaning Manual Appendices. Health Service Executive; 2006. Available online from: http://www.hse.ie/eng/services/publications/hospitals/HSE_National_Cleaning_Standards_Manual_Appendices.pdf

6. Appendices

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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