Health Information and Quality Authority

An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

Report of the unannounced inspection at St Lukes General Hospital, Kilkenny.

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: 25 May 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[1] 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.
- The 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 individual self-assessment tools completed by hospitals. The lines of enquiry which are aligned to the National Standards are included in this report in Appendix 1.

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

Phase Three

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

Information about this inspection

This inspection report was completed following an unannounced inspection carried out at St Lukes General Hospital, Kilkenny by Authorised Persons from HIQA; Aileen O' Brien, Noreen Flannelly-Kinsella, Siobhan Bourke and Shane Grogan. The inspection was carried out on 25 May 2017 between 09:45hrs and 15:20hrs.

Prior to this inspection, inspectors 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 also reviewed documentation and data and observed practice within the clinical environment in a small sample of clinical areas which included:

- a surgical ward and
- the Intensive Care 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)

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

2. Findings at St Lukes General Hospital, Kilkenny

The following sections 2.1 to 2.8 present the general findings of this unannounced inspection which are aligned to monitoring lines of enquiry as shown in Appendix 1.

2.1 Governance

Line of enquiry 1.1

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

Governance arrangements

St Lukes General Hospital is a statutory hospital owned and managed by the Health Service Executive (HSE) and is part of the Ireland East Hospital Group* governance structure.

HIQA found that governance and management arrangements around the prevention and control of healthcare-associated infection at St Lukes General Hospital were not aligned to the current Ireland East Hospital Group governance structure. This arrangement does not facilitate effective oversight at hospital group level.

The Infection Prevention and Control Team was a joint St Lukes General Hospital and Kilcreene Orthopaedic Hospital infection prevention and control team which reported into an infection prevention and control committee again serving both St Lukes General Hospital and Kilkreene Orthopaedic Hospital. Kilkreene Orthopaedic Hospital was managed by University Hospital Waterford in the South/South West Hospital Group. One of the infection control nursing positions was shared between St Lukes General Hospital and Kilkreene Orthopaedic Hospital meaning that this position reported into two hospital group structures.

The Infection Prevention and Control Committee reported into St Lukes General Hospital Quality and Safety Committee along with 21 other hospital committees. The Quality and Safety Committee reported into the Executive Management Team which included the General Manager and other senior hospital managers. The General Manager as the person with overall accountability and responsibility for the hospital reported to the Ireland East Hospital Group Chief Executive Officer.

* Ireland East Hospital Group comprises 11 hospitals and is led by a Group Chief Executive Officer with delegated authority to manage statutory hospitals within the group under the Health Act 2004.

The joint hospital Infection Prevention and Control Committee was chaired by the Director of Nursing at St Lukes General Hospital and the committee met quarterly. Hospital management confirmed that the Director of Nursing represented nursing clinical services from adult, paediatric and maternity services. The Clinical Director or a nominated clinical lead represented all clinical specialties at the hospital. Hospital consultants from clinical specialities were requested to attend committee meetings if required. Additionally, a surveillance scientist was not a member of this committee.

Review of documentation and discussion with staff did not indicate that there was a clear strategic plan for the prevention and control of healthcare-associated infection that was aligned to identified risks. HIQA was informed that infection prevention and control teams from four hospitals (including St Lukes' General Hospital) and one Community Health Organisation were members of the Regional South East Infection Prevention and Control Committee. Inspectors were informed that this committee encompassing four hospitals from two different hospital groups worked together in relation to strategic infection prevention and control work including policy development. This committee did not form part of the formal governance structure of St Lukes General Hospital.

Work in relation to antimicrobial stewardship was overseen by St Lukes General Hospital Drugs and Therapeutics Committee which also reported into the hospital's Quality and Safety Committee.

Microbiology services at the hospital were provided by Waterford University Hospital which was part of the South/South West Hospital Group. Operationally, Waterford University Hospital provided clinical microbiology services across two hospital group structures to St Lukes General Hospital, Kilkreene Orthopaedic Hospital, Wexford General Hospital and South Tipperary General Hospital. This was a legacy arrangement originating from the previous HSE South East Region and remained unchanged when the Ireland East Hospital Group governance structure was formed. Within the current governance construct there were no formalised working arrangements between St Lukes General Hospital Infection Prevention and Control Team and Infection Prevention and Control Committee members, and their counterparts in other hospitals in the Ireland East Hospital Group.

There was also a lack of clarity in hospital governance arrangements in relation to the Infection Prevention and Control Committee and other hospital committees and departments, for example in relation to hygiene, decontamination, building project management, water supply management and antimicrobial stewardship.

St Lukes Hospital Kilkenny had established several hospital committees through which to govern services. HIQA has previously identified through prior monitoring work that other similar sized 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] Governance arrangements did not appear to be clearly understood by some of the staff HIQA spoke with during this inspection, and this needs to be revisited by the hospital following this inspection.

Infection prevention and control service

The Infection Prevention and Control Team at St Lukes General Hospital was led by a part-time consultant microbiologist position jointly appointed between St Lukes General Hospital and Waterford University Hospital. It was reported that the Consultant Microbiologist attended St Lukes General Hospital in person for two hours, on one day a week (0.1 whole-time equivalent[†] hours), and also provided remote support to the team which it was explained was in excess of formal contractual arrangements. Twenty four hour clinical microbiology advice was available by telephone to hospital staff and this was provided on a rotational basis by consultant microbiologists, all based at University Hospital Waterford. HIQA note the relatively limited amount of onsite consultant microbiologist resource allocated to the hospital, given the size and complexity of services provided. It is recommended that the hospital reviews the number of hours that a Consultant Microbiologist is contracted to work at the hospital in light of the importance of such a position from both a leadership and expertise perspective around infection prevention and control, the speciality mix at the hospital, and in consideration of inherent risks around infection prevention and control.

The Infection Prevention and Control Team included three nursing positions giving a total of two whole-time equivalent (WTE) infection prevention and control nurses. The formal allocation of infection prevention and control nurses for the hospital was 1.5 WTE and this had not changed in over ten years. To compensate for increased infection control nursing input required, the hospital had funded an additional 0.5 WTE position to support the team's workload. Permanent infection prevention and control nurses at the hospital had completed post-graduate training in infection prevention and control. The team also included one WTE clerical officer administrative position. Hospital management confirmed that surveillance scientists based in University Hospital Waterford compiled surveillance data for both the Infection Prevention and Control Team and the Infection Prevention and Control Committee. In addition, surveillance scientists provided antimicrobial resistance data to the Antimicrobial Stewardship Team in St Lukes General Hospital.

[†] 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.

Infection prevention and control team workload

Infection prevention and control staff performed alert organism[‡] and alert condition surveillance from Monday to Friday and advised on the placement of patients requiring isolation. Infection prevention and control staff provided advice to hospital committees as required. Review of documentation and discussion with the Infection Prevention and Control Team showed that the team's workload in 2016 and 2017 was prioritised on managing the following:

- providing advice in relation to patients colonised or infected with transmissible organisms
- advising on the management of outbreaks of infection and alert organism and alert condition surveillance
- oversight of microbiological screening.

Inspectors were told that finding inpatient accommodation for patients with transmissible infection was a day to day challenge due to busy patient throughput and an insufficient number of hospital beds and isolation rooms to meet the demand for beds. It was noted during inspection that the team had not been able to deliver staff education sessions from January to April 2017 and this was reported to be due to workload pressures. This pattern of work activity had impeded the ability of the team to perform proactive work including staff education, audit, preparation of reports, quality improvement initiatives and strategic planning in relation to infection prevention and control. In addition, infection prevention and control nurse staffing levels had impacted on the delivery of the infection prevention and control programme.

Monitoring and evaluation

Hospital management monitored the following performance indicators in relation to the prevention and control of healthcare-associated infection 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 antibiotic consumption
- alcohol hand rub consumption

[‡] 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.

- 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 Executive Management Team met monthly and infection prevention and control was a standing agenda item at that meeting. Monthly hospital performance meetings with the hospital group Chief Executive Officer were attended by the General Manager, the Clinical Director, the Director of Nursing and other members of the Executive Management Team. 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 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

St Lukes General Hospital Kilkenny was participating in a national point prevalence survey of hospital-acquired infections and antimicrobial use which was part of a European-wide point prevalence study. Information for this study was being collected at the hospital during the month of May. Data from this study should be used to proactively identify areas for improvement at the hospital. The hospital had also participated annually in a national antimicrobial point prevalence survey since 2012.

Hospital management told inspectors that environmental hygiene standards were comprehensively monitored at the hospital. Reports reviewed by inspectors found that desirable standards of environmental hygiene were regularly identified by local auditors as not being consistently achieved in general hospital wards. This did not provide assurance that deficiencies identified were comprehensively addressed.

Findings in this regard will be presented in section 2.6.1 in this report. Hygiene audit reports reviewed by inspectors did not clearly identify findings in respect of frequently touched items of patient equipment.

Hospital management informed inspectors that it was hospital policy to report incidents of healthcare-associated infection and occurrences of patients being boarded on hospital corridors on the hospital incident management system.

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

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.

Major risks included on the infection prevention and control risk register since 2013/2014 and updated in 2015 were reviewed by inspectors. These included; lack of isolation facilities, large multi-occupancy wards with poor bed spacing and infection prevention and control nurse resources. A moderate risk was documented in respect of consultant microbiologist staffing levels. The risk register in respect of infection prevention and control did not appear to be reviewed and updated on a regular basis despite this being an agenda item at meetings of the Infection Prevention and Control Committee.

Risks in relation to overcrowding and insufficient isolation facilities had been included in the overall hospital risk register and had been escalated to hospital group level.

To address the identified risks, the hospital had made a capital submission to the Ireland East Hospital Group for a new building with 75 single rooms to include six rooms with specialised ventilation and scope for a new intensive care unit. At the time of inspection, hospital management had not received confirmation from the HSE in respect of funding for new developments. Plans were in place to renovate an older ward to facilitate the accommodation of patients while clinical areas were being refurbished during this summer. The hospital planned during the coming winter period, to use this ward to provide an extra 14 beds to accommodate patients. This short-term arrangement would not however provide a necessary increase in available isolation facilities.

Potential risks in relation to the prevention and control of healthcare-associated infection identified by HIQA during this inspection will be discussed further in this report.

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 infection prevention and control team at the hospital was in the process of reviewing and updating infection prevention and control policies for hospital staff in conjunction with the HSE South East Infection Prevention and Control Committee. The hospital had a suite of infection prevention and control policies. This comprised policies which covered aspects of standard precautions, transmission-based precautions, outbreak management and prevention of invasive device-related infection. Inspectors found that some of the hospital's infection prevention and control policies were due for review this year. Three policies in relation to standard and transmission precautions had not been updated since 2011. The hospital had recently drafted an isolation prioritisation protocol.

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 hospital Infection Prevention and Control Committee which is appropriate.

Hospital policies, procedures and guidelines were made available to staff in both electronic format on the hospital intranet and in hard copy in folders in clinical areas. The hospital did not have a controlled electronic document management system to ensure staff only had access to the most up to date version of hospital policies, procedures and guidelines.

2.4 Staff training and education and access to information

Line of enquiry 3

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

National hand hygiene guidelines recommend that hand hygiene training should be mandatory for relevant staff at induction and every two years thereafter.[5] Documentation provided by the hospital showed that hand hygiene training was mandatory for staff at induction and every year thereafter and that education around standard and transmission-based infection control precautions was mandatory for staff at induction and thereafter every two years.

It was reported that hand hygiene education was delivered through practical training delivered by infection prevention and control nurses and link nurses. In addition staff had access to the HSE elearning programme for hand hygiene.

Documentation reviewed showed that only 55% percent of relevant staff at St Lukes General Hospital had undertaken hand hygiene training in the previous two years. Uptake of training by medical and nursing staff was 30% and 51% respectively. The provision of training to hospital staff had been delayed in 2017 due to infection prevention and control staffing levels and workload. A training schedule had been developed for the remainder of this year.

It was reported that the hospital had aligned infection prevention and control education for staff to the national framework for such knowledge and skills.[6]

A small number of medical staff were provided with training on aseptic non-touch technique during 2016. Education in relation to antimicrobial prescribing was provided by the Consultant Microbiologist to clinical staff during medical and surgical team 'grand rounds'[§]. Teaching in relation to antimicrobial stewardship was provided by hospital pharmacists to non-consultant hospital doctors at induction. Sixty-five nurses and midwives had been trained in relation to techniques for insertion of peripheral venous catheters and taking specimens of blood from a vein.

Information about staff training uptake was presented in an infection prevention and control end of year report. Although inspectors were informed that attendance at training was collated centrally at the hospital, the report did not indicate the percentage of staff who had undertaken infection prevention and control training. In

[§] 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

order to provide assurance to hospital management that infection prevention and control training has been provided to staff, attendance should be reported in a manner that shows the proportion of relevant staff who received training.

The hospital had a number of infection prevention and control link practitioners. [**] Infection prevention and control staff told inspectors that the input of infection prevention and control link practitioners had been less effective more recently as attendance at meetings by these link staff was poor. This was attributed to staff work pressures in clinical areas which did not facilitate attendance at these meetings.

Clinical staff at the hospital had access to clinical microbiology advice twenty four hours a day. There was access to infection prevention and control nurse advice on days that an infection prevention and control nurse was on duty.

Hospital management stated that antimicrobial resistance data was communicated regularly by the Antimicrobial Stewardship Team at medical grand Rounds, surgical grand rounds and periodically at obstetric and gynaecology speciality teaching sessions in St Lukes General Hospital.

Reports reviewed by inspectors showed that clear written advice in relation to control measures was communicated to hospital staff during outbreaks of infection.

[**] 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.

2.5 Implementation of evidence-based 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, and surgical site 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, 9] published in recent years recommending their introduction across the Irish health system. Inspectors looked at aspects of the prevention of invasive device-related infection in the Intensive Care Unit. The implementation of care bundles to prevent invasive device-related infection was reviewed in both of the clinical areas inspected.

Care bundles for intravascular devices, urinary catheter care and ventilator-associated pneumonia were used in the Intensive Care Unit. There was no defined policy in relation to the prevention of ventilator-associated pneumonia. The hospital had incorporated an insertion, management and removal record for peripheral vascular catheters into their 'national early warning score[‡‡] adult patient observation chart'. Clinical staff were required to document device insertion and removal dates. Nursing staff were required to assess and record the continuing indication for the device, and the condition of the device and insertion site, twice a day. Documentation reviewed indicated that the hospital's policies for intravascular device management and aseptic technique were due for review.

Care bundles in relation to urinary catheter care had not been implemented across the hospital. This was highlighted during a HIQA inspection in 2015 and had not been progressed. Hospital management said that they planned to progress this in June 2017.

Inspectors found that some auditing of implementation of care bundles was performed in clinical areas but findings were not collated and overseen centrally by nursing management at the hospital.

[††] A bundle is a small, straightforward set of evidence-based practices that, when performed collectively and reliably, have been proven to improve patient outcomes.
[‡‡] Calculation of an early warning score aims to facilitate early detection of clinical deterioration of a patient in hospital.

The hospital did not have a policy in relation to the prevention of surgical site infection other than guidelines for surgical antimicrobial prophylaxis. Such a policy should be developed based on best practice guidelines.[10,11,12,13]

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.[14,15,16] 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.[17,18,19] 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.[20,21]

Surveillance of these types of healthcare-associated infection was not performed at St Lukes General Hospital. HIQA acknowledges that currently this is the case in many public hospitals of similar size and activity level in Ireland. Implementation of surveillance of healthcare-associated infection surveillance programme requires dedicated resources and expertise. Hospital management told inspectors that the feasibility of introducing targeted surveillance of caesarean section surgical site infection at the hospital was being explored. HIQA acknowledges that the undertaking of such surveillance would require additional specialist staff. Cooperation with other hospitals in the context of the wider hospital group in this regard may also be worthy of further exploration.

Some information was available in relation to healthcare-associated infections through clinical incident reporting structures. This included incidents of caesarean wound infection, non-availability of isolation rooms and other uncategorised incidents. A report on such incidents was reviewed by inspectors. However, HIQA note that this report did not facilitate trending or identification of areas for improvement. Reporting in this regard should be refined and improved across the hospital.

Root cause analyses were performed by the Infection Prevention and Control Team in respect of bloodstream infections due to *Staphylococcus aureus* bacteria. Delays were experienced in completing analyses in respect of *Staphylococcus aureus* bloodstream infections because relevant staff were not always available to meet with the team. The process for undertaking such analyses should be reviewed to ensure timely analysis, learning and reciprocal improvement. Hospital management told inspectors that they were addressing this issue.

[§§] 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 multi-drug resistant organisms

Line of enquiry 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.

On 24 May 2017, the day before this inspection, 'Trolley Watch'[***] figures indicated that 44 patients were on 'trolleys' in the hospital. This means that there was insufficient capacity at the hospital to accommodate admitted patients. Hospital management reported that on the day 18 patients were accommodated on ward corridors in that three extra patients were accommodated on each of six inpatient wards. The remaining patients were accommodated in the Emergency Department and in the Acute Medical Assessment Unit. A review of trolley watch data for the hospital for the two months prior to this inspection would suggest that such high numbers would have been uncommon at the hospital up to the date of this inspection. However, it was reported by management that extra patients were frequently accommodated on the corridors of the hospital's wards.

During this inspection, HIQA identified the following infection prevention and control risk issues related to hospital facilities and capacity:

- overcrowding at the hospital with patients being frequently accommodated on beds on ward corridors
- insufficient isolation facilities for patients with transmissible infection
- poor inpatient accommodation infrastructure.

Collectively, these findings in tandem with high patient activity levels do not facilitate effective prevention and control in an acute hospital setting and are not in line with current National Standards or evidence-based best practice guidelines.

Documentation reviewed by HIQA and discussion with hospital management showed that multiple factors were restricting the hospital's ability to effectively prevent and control healthcare-associated infection. Documentation relating to incidents and outbreaks of infection at the hospital showed common recurring deficiencies in relation to hospital infrastructure, resources and high bed occupancy levels.

[***] Trolley Watch Figure 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 a shortage of available hospital beds. Online. Available at: https://www.inmo.ie/6022

On the day of inspection, 21 patients required single room isolation for infection control purposes. Information provided by the hospital showed that there were 18 single rooms at the hospital and all of these were occupied by patients requiring infection control precautions. However, only five of these single rooms for adult patients had ensuite toilets and one of these was located in the Coronary Care Unit.

The lack of isolation facilities likely meant that patients with transmissible infection were frequently moved throughout the hospital whenever a single room became available. This practice could be avoided if patients could be admitted directly into single ensuite rooms. Hospital management had requested capital funding from the HSE to increase single room accommodation at the hospital.

The original hospital building was dated and inspectors were informed that there were a number of larger multi-occupancy nightingale style patient wards at the hospital, some with seven beds and some with 12 beds. This configuration does not facilitate effective infection prevention and control.

Isolation rooms with specialised ventilation for patients with airborne infection were available in the new wing of the hospital, which opened in May 2016. Two isolation rooms with specialised ventilation were located between the new Emergency Department and the Acute Medical Assessment Unit. Two isolation rooms with specialised ventilation were also located in the Oncology Day Unit and in the Day Services Unit. Hospital management stated that rooms in the Emergency Department and the Acute Medical Assessment Unit were frequently used for inpatient isolation as deemed necessary. Facilities with specialised ventilation should ideally be available within inpatient clinical areas at the hospital.

2.6.1 Preventing the spread of antimicrobial resistant organisms

Measures to prevent the spread of antimicrobial resistant organisms were reviewed in both of the clinical areas inspected.

Intensive Care Unit

As outlined in a previous HIQA inspection report, the Intensive Care Unit infrastructure did not facilitate effective infection prevention and control because of limited space between beds, insufficient isolation facilities and insufficient ancillary rooms.[22]

There was one single room in the Intensive Care Unit which opened directly into the open plan area of the unit. Inspectors learned that because of insufficient isolation facilities, patients with transmissible microorganisms were often accommodated in the open plan area of the unit which does not facilitate effective containment of transmissible infection.

Environmental surfaces and patient equipment inspected in the Intensive Care Unit were visibly clean. Hygiene audit results reviewed for 2017 showed compliance with desirable standards to be consistently greater than 85% and this was reflected on the day of inspection.

There were insufficient facilities for the storage and management of patient equipment and cleaning equipment in the Intensive Care Unit. Inspectors found that mechanical ventilators were stored on a public corridor next to an open window outside the unit. Commodes were stored in a patient bathroom which is poor practice. In addition, household cleaning equipment was stored within a cupboard in a patient equipment storeroom. These findings were also made during a HIQA inspection in 2015.

Similar findings in relation to Intensive Care Unit infrastructure which were previously identified by HIQA in 2015 were essentially unchanged. These will be discussed further in this report in Section 2.8.

Surgical Ward

On the day of the inspection, there were two extra patients in beds located on the corridor of a surgical ward inspected. The hospital's escalation policy to deal with Emergency Department overcrowding included the accommodation of patients in beds located on inpatient ward corridors. It was reported that the practice of boarding patients on the corridor in this ward was a regular occurrence. Overcrowding in hospitals has been shown to increase the risk of spreading infection.[23]

The infrastructure of the surgical ward did not facilitate effective infection prevention and control. The ward comprised 29 beds with two single rooms, these single rooms did not have an ensuite toilet or a hand wash sink for patients. These rooms were used as required to accommodate patients with transmissible infection and patients were assigned a designated commode placed within the room. One patient room which contained 12 beds was located on the surgical ward inspected and was used to accommodate both medical and surgical patients which is less than ideal from an infection prevention and control perspective. Not all multi-occupancy rooms had ensuite toilets.

Commodes and privacy screens for patients were stored in a communal patient's shower/toilet room which is poor practice.

Environmental surfaces and patient equipment inspected in the Surgical Ward were unclean and dust was present on a number of surfaces. This finding was communicated to hospital management on the day of inspection so that they could address the issue. Trended hygiene audit results reviewed for 2016 and 2017 clearly

showed that compliance with desirable standards to be consistently less than 85% and this was evident on the day of inspection. Negative trends in hygiene audit results and the causes of these should be effectively addressed by hospital management.

Checklists reviewed indicated that weekly cleaning of patient equipment had not been consistently performed. It was reported that staff responsible for cleaning patient equipment were not regularly allocated time to perform routine cleaning due to competing demands such as the need to provide one to one care to patients.

The surgical ward did not have an appropriately equipped room for the storage and management of cleaning equipment. Hospital wards should have a designated cleaners room equipped with a janitorial sink, handwashing facilities and space for cleaning equipment.[24] Inspectors saw that cleaning equipment was moved between two surgical wards. Some cleaning equipment was stored in a 'dirty' utility room[†††] in the surgical ward inspected. This practice increases the risk of contaminating cleaning equipment with bacteria or other infectious organisms, and increases the risk of transferring such organisms to surfaces or the hands of staff caring for patients.

Given the infrastructural challenges in the hospital, the practice of boarding patients in beds on ward corridors and the lack of isolation facilities, it is imperative that patient care areas are kept clean at all times. Cleaning practices, resource allocation and supervisory arrangements should be reviewed as a priority. Deficiencies should be addressed and overall hygiene standards should be re-evaluated on a scheduled basis.

2.6.2 Safe injection practice

Inspectors looked at implementation of aspects of standard precautions to assess safe injection practice in the clinical areas inspected. Staff spoken with were able to describe recommended practice in relation to giving injections safely.

Inspection of the clinical environment showed that there was good practice in relation to the storage and management of medication for injection and related supplies with some exceptions. Inspectors found that the Intensive Care Unit and the surgical ward inspected did not have clearly designated areas for medication preparation in their respective clean utility rooms. It is recommended that a separate work space is provided and that this area is free of stored supplies.

[†††] A 'dirty' utility room is a temporary holding area for soiled/contaminated equipment, materials or waste prior to their disposal, cleaning or treatment.

Surfaces in the medication preparation room in the Intensive Care Unit were visibly clean. Some patient equipment, sterile supply storage containers, a medication fridge, and environmental surfaces in the clean utility room in the surgical ward were not clean however.

Medications and sterile equipment for administering products by injection were stored appropriately with a few exceptions. Inspectors saw that supplies for multiple blood glucose testing procedures were brought to a patient's bedside on one occasion in the surgical ward inspected. Staff should only bring the supplies needed for a single procedure to the bedside so as to reduce the risk of contaminating multiple clean supplies with blood.

The location of a blood analyser machine on a mobile trolley in the open plan space of the Intensive Care Unit was unchanged since the last HIQA inspection in 2015.[22] Upon inspection, small splashes of blood were visible on the surfaces of the machine and on adjacent surfaces. As previously reported by HIQA, this type of equipment should be stored in an appropriate location.

2.6.3 Other measures to prevent the transmission of infection

Hand hygiene

St Lukes General Hospital participates in the national hand hygiene audits, results of which are published twice a year. Since 2015, the hospital has consistently achieved the required HSE national hand hygiene compliance target of 90%.

Documentation reviewed showed that audit of hand hygiene compliance for national reporting purposes was in progress during May 2017 and overall hand hygiene compliance results for the latest hand hygiene monitoring period were being compiled.

The most recent hand hygiene compliance audit results in the Intensive Care Unit showed 97% compliance among staff in an audit in October 2016. Results of an audit in May 2016 showed 97% hand hygiene compliance in the surgical ward inspected.

Alcohol gel was available at the point of care in the clinical areas inspected in line with best practice guidelines.

Outbreak management

Documentation reviewed showed that there had been a number of outbreaks of infection in the hospital in the preceding 12 months. Outbreak reports reviewed showed that these outbreaks were effectively contained and managed. There were no outbreaks ongoing on the day of inspection. Outbreak reports reviewed by

inspectors showed recurring factors that hinder good infection control practices, and these included lack of isolation facilities, overcrowding and accommodation of patients on ward corridors. Documentation reviewed showed that during a recent carbapenemase producing Enterobacteriaceae[‡‡‡] (CPE) outbreak, separate nursing staff could not be assigned to care for patients colonised with this particularly resistant bacteria due to staffing deficiencies. Management at the hospital attributed this to a shortage of nursing staff at the hospital at that time.

Prevention of *Clostridium difficile* infection

An increased incidence of *Clostridium difficile* infection was observed at the hospital in Quarter 1, 2017. This was reviewed and reported upon by the Infection Prevention and Control Team. No obvious links were identified to indicate an outbreak of infection; however, genetic typing of isolates from patients in a reference laboratory was not performed. Some problems were identified in relation to bedpan washer functionality in wards; hospital management should ensure that all bedpan washers at the hospital are operating correctly. The Infection Prevention and Control Team had proactively introduced the use of a *Clostridium difficile* infection trigger tool across the hospital as a result of this review to highlight the need to introduce enhanced infection control measures when an increase in cases of *Clostridium difficile* infection was observed. Enhanced surveillance of all cases of *Clostridium difficile* infection was reinstated at the hospital.

Prevention of water-borne infection

At the time of inspection, a formal Legionella risk assessment had not been performed at the hospital since 2004/2005 despite major changes to the hospital infrastructure in the interim. This was also identified during a previous HIQA inspection in 2015.[22] Hospital management reported that measures in relation to waterborne infection were implemented on a continual basis and that works recommended in the last risk assessment were undertaken on a phased basis. Legionella control measures overseen by the hospital's Environmental Monitoring Committee included the following:

- an ongoing programme of chemical and thermal treatment of the water supply, regular outlet flushing, flushing of water mains and fire hoses, water storage tank inspection and cleaning,
- monitoring arrangements included water temperature testing and weekly microbiological testing of water from a sample of water sources. The hospital also had monitored alarms in respect of water temperature and chlorine levels.

[‡‡‡] Carbapenemase producing Enterobacteriaceae (CRE), are a family of bacteria which can cause infections that are difficult to treat because of high levels of resistance to antimicrobials.

Going forward, it is recommended that water supply risk assessment and risk assessment review are performed within the timeframes recommended in current relevant national guidance.[25,26] Following this inspection, hospital management told HIQA that a risk assessment in respect of the hospital water supply had commenced at the end of June 2017.

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.

New computer software had been introduced to identify patients with transmissible infection in the hospital information management system to help hospital staff to recognise patients who required isolation precautions and microbiological screening.

The Infection Prevention and Control Team produced a newsletter for staff in 2017. This was a new development and the first edition contained information about the new system to identify patients with transmissible infection on the hospital information management system, the European Point Prevalence Study, access to infection prevention and control policies, patient information leaflets and isolation room signage.

2.8 Progress since the previous HIQA inspection

Since the last HIQA inspection the hospital had opened a new building in May 2016 which included a number of different service units including:

- an oncology day unit, which increased the previous capacity from six to 10 beds.
- a day services unit, which increased capacity from a 12 bedded unit to a 24 bedded unit.
- an endoscopy unit with two endoscopy suites.
- an acute medical assessment unit which was a 10 bedded unit, with single assessment bays.
- An emergency department comprising 18 cubicles, in addition to treatment bays and triage rooms and three resuscitation bays.

Public areas of the new building seen by inspectors were bright and spacious and this development has greatly improved the appearance of the main hospital entrance way for patients and visitors.

HIQA reviewed quality improvement plans (QIPs) developed by the hospital following the 2015 inspection.[27] Issues identified by HIQA during the last inspection in December 2015 had not been comprehensively addressed. Hospital managers told inspectors that this was due to the need for further capital investment at the hospital. The infrastructure of the Intensive Care Unit which was revisited during this inspection was essentially unchanged. Bed spacing, isolation facilities, storage and ancillary facilities in the unit remained insufficient.

Inspectors were informed that the hospital had secured funding to carry out limited renovation work to the Intensive Care Unit which was scheduled for this year. Inspectors were told that this plan included maintenance work and the provision of an anteroom for the isolation room in the Intensive Care Unit so that the isolation room would not open directly into the main unit. It is recommended that Intensive Care facilities are designed in line with best practice guidelines.[28]

3. Conclusion

HIQA found that some but not all essential elements of an infection prevention and control programme were in place in St Lukes General Hospital. Implementation of a comprehensive infection prevention and control programme was limited by the daily need to address patient isolation and placement requirements in a frequently overcrowded hospital with poor inpatient accommodation infrastructure and a lack of isolation facilities. The relative degree of access to a consultant microbiologist and limited surveillance systems did not facilitate day to day operational oversight and planning of infection prevention and control activities. Overall, HIQA found through this inspection that 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.

Governance and management arrangements around the prevention and control of healthcare-associated infection at St Lukes General Hospital were not aligned to the current Ireland East Hospital Group governance structure. These arrangements should be reviewed and addressed following this inspection.

A combination of factors that increase the risk of transmission of infection were identified in St Lukes General Hospital which included; insufficient bed capacity and overcrowding, insufficient isolation facilities, and poor hospital infrastructure in inpatient clinical areas. Many of the issues identified during this inspection are not unique to St Lukes General Hospital. However, the composite of these factors increases the risk of infection transmission making the hospital vulnerable to person to person spread of infection and outbreaks of transmissible infection. This is a concern, given that the hospital had experienced a recent outbreak of carbapenemase producing Enterobacteriaceae in addition to other outbreaks of transmissible infection.

Some of the risks impeding effective infection prevention and control as they exist cannot be sufficiently mitigated at local hospital management level. Mitigation of these risks will require support at senior HSE and hospital group level to address infrastructural deficiencies and capacity.

In the interim of any future development, hospital management should systematically assess current risks in relation to the prevention and control of healthcare-associated infections at the hospital. This review needs the support of the wider hospital group structure.

Environmental hygiene audit results reviewed by inspectors did not provide assurance that inpatient wards were well maintained and consistently clean. Given the infrastructural challenges in the hospital, the practice of boarding patients on

ward corridors and the lack of isolation facilities, it is imperative that desirable standards of hygiene and maintenance are consistently achieved in patient care areas. Cleaning practices, related resources and supervisory arrangements should be reviewed and improved upon. Care bundles for invasive device management need to be fully implemented and ongoing assurance needs to be provided to management in this regard.

Notwithstanding the identified areas for improvement found through this inspection, inspectors found that the infrastructure of some facilities for people attending the hospital had been recently significantly improved. Specifically, the hospital had opened a newly built Emergency Department, and day and out-patient facilities one year prior to this inspection. This is a welcome development.

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5. Appendix

Appendix 1: Lines of enquiry for unannounced monitoring inspections 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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