Health Information and Quality Authority

An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

Report of the unannounced inspection at Mayo University Hospital, Castlebar.

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: 15 May 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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1.0 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.

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 October 2017, the Minister for Health activated a Public Health Emergency Plan[*] and convened a National Public Health Emergency Team as a public health response to the increase of Carbapenemase Producing *Enterobacteriaceae* (CPE)[†] in Ireland. In light of the ongoing national public health emergency the focus of inspections in 2018 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 from quarter 3 2018.

Information about this inspection

This inspection report was completed following an unannounced inspection carried out at Mayo University Hospital, Castlebar by Authorised Persons from HIQA; Noreen Flannelly-Kinsella, Kathryn Hanly and Kirsten O' Brien. The inspection was carried out on 15 May 2018 between 09:00hrs and 16:15hrs.

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

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

- The Intensive Care Unit and Coronary Care Unit (ICU/CCU)
- Ward B: a medical ward.

The inspection team used designed monitoring tools during this inspection and focused specifically on aspects of the prevention and control of transmission of

[*]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 Carbapenemase Producing *Enterobacteriaceae* (CPE) in Ireland. As a result a National Public Health Emergency Team was convened and they have been meeting on a weekly basis since 02 November 2017. Please refer to the Department of Health webpage for further details: http://health.gov.ie/national-patient-safety-office/patient-safety-surveillance/antimicrobial-resistance-amr-2/public-health-emergency-plan-to-tackle-cpe/nphet-press-releases-minutes-of-meetings/

[†]Carbapenemase Producing *Enterobacteriaceae* (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.

antimicrobial-resistant bacteria and healthcare-associated infections. All low level findings observed in the areas inspected were reported to the local ward managers to inform ongoing improvement measures.

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

2.0 Findings at Mayo University Hospital

Inspection findings showed that the hospital had actively endeavoured to address the issues identified in HIQA's previous unannounced inspection in 2016. Furthermore in light of the National Public Health Emergency in relation to CPE and the importance of screening for CPE, hospital management told inspectors that screening for CPE[3] was in line with the latest national guidance. This was further validated following discussions with staff in both clinical areas inspected.

The following sections 2.1 to 2.4 present the general findings of this unannounced inspection which are aligned to monitoring lines of enquiry. The report is structured as follows:

- Section 2.1 outlines a risk identified during this unannounced inspection.
- Sections 2.2 to 2.4 present the general findings of this unannounced inspection which are aligned to the lines of inquiry.

2.1 Risk identified during this unannounced inspection

Inspectors were informed that hospital management had identified a high risk in relation to blood cultures not being processed between 12midnight and 8am at the hospital.

On review of inspection findings HIQA sought assurance regarding arrangements put in place by the hospital to actively manage this high risk and identify the controls to mitigate same. In response, the general manager at the hospital outlined key actions implemented by the hospital to manage the risk.

A copy of the letter issued by HIQA to the general manager of Mayo University Hospital to seek further assurance regarding the risk previously identified by the hospital and a copy of the response and associated assurance and risk management plan received from the general manager of the hospital are shown in Appendices 2, 3 and 4 respectively.

2.2 Governance and risk management

Governance arrangements

Inspectors found that there were clear lines of accountability and responsibility in relation to the prevention and control of healthcare-associated infection at the hospital. Mayo University Hospital, Castlebar is a statutory hospital owned and managed by the Health Service Executive (HSE), and is a member of the Saolta University Health Care Group.[‡] The general manager held overall accountability and responsibility for the prevention and control of healthcare-associated infection at the hospital.

Hospital management told inspectors that recently reconfigured governance arrangements, ensured more effective reporting structures and enhanced communication between hospital management and staff; resulting in stronger assurances for the Hospital Management Team. It was explained at interview that the Hospital Management Team formally met on a weekly basis. Hospital directorates, clinical committees and sub-committees reported to the Hospital Management Team on a cyclical basis at this meeting. A standardised reporting template was completed by directorates and/or committees for each assigned meeting.

Governance and management arrangements in relation to the infection prevention and control programme at the hospital were also aligned to the clearly defined hospital reporting structures. The infection prevention and control programme was delivered by the Infection Prevention and Control Team (IPCT). Inspectors were informed that the IPCT reported to the Infection Prevention and Control Group which met monthly.

The IPCT also reported to the hospital's Infection Prevention and Control Committee (IPCC) meeting held quarterly. Minutes of meetings reviewed by inspectors showed that attendance was variable. The terms of reference of the IPCC showed that the committee reported to the Hospital Management Team on a monthly basis.

An annual report and plan was produced by the IPCT. The 2017 annual report was in draft form at the time of inspection; the hospital should ensure timely sign-off so

[‡] Hospital groups: The hospitals in Ireland are organised into seven hospital groups: 1. Ireland East Hospital Group. 2. Dublin Midlands Hospital Group. 3. South/South West Hospital Group. 4. Saolta University Health Care Group. 5. University Limerick Hospitals Group. 6. RCSI Hospitals Group. 7. National Children's Hospital Group.

that identified service gaps are prioritised to mitigate any risks to the service. The 2018 annual plan outlined individual roles, responsibilities and objectives for members of the IPCT.

Additionally, the Saolta University Health Care Group had formalised governance arrangements in place in relation to infection prevention and control across the group. The IPCC at Mayo University Hospital along with other hospitals in the group, reported to the Saolta University Health Care Group Infection Prevention and Control Committee meeting held quarterly.

Infection Prevention and Control Team

The IPCT monitored the implementation of the infection prevention and control programme at the hospital by conducting ongoing audits in relation to many components of the programme for example general infection control audits, blood glucometers and sluice room audits. The IPCT undertook daily ward visits and held weekly meetings. Minutes of meetings reviewed by inspectors showed that a revision of the previous week's action log was undertaken at each meeting to ensure that previous discussions and recommendations were acted upon.

Hospital management informed inspectors that additional support had been provided to the IPCT since the last inspection by HIQA which included:

- one whole time equivalent (WTE)[§] permanent consultant microbiologist position appointed September 2016
- one WTE infection prevention and control clinical nurse specialist (IPC CNS) appointed August 2017 (a total of 2.4 WTE IPC CNS positions)
- 0.5 WTE administration support appointed October 2017.

Since January 2018 the IPCT had been further increased by the addition of a non-consultant hospital doctor in microbiology.

The IPCT was led by the consultant microbiologist who provided 24-hour seven-days-a-week expert advice to hospital staff, with formalised locum cover arrangements during leave. Staff told inspectors that the appointment of a permanent consultant microbiologist had been of benefit to both staff and patients at the hospital. This had been previously highlighted by HIQA as an issue and is now addressed.

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

The IPCT also included two antimicrobial pharmacists (a total of 1.0 WTE position) and 1.0 WTE surveillance scientist.

Policies and procedures

The hospital had a suite of infection prevention and control policies, procedures and guidelines which covered aspects of standard precautions, transmission-based precautions and multidrug-resistant organisms including outbreak management. These were available to staff through an electronic document management system.

Inspectors noted that policies, procedures and guidelines from other hospitals in the Saolta University Health Care Group were also available on this system thereby posing some delays for staff to access local documents in a timely manner. The potential to standardise these documents across the hospital group should be explored going forward.

Current HSE policy states that hospital policies, procedures and guidelines should be reviewed every three years.[4] At the time of inspection a number of infection prevention and control policies were due to be reviewed. It was reported to inspectors that currently the hospital along with other hospitals in the hospital group, were in the process of updating a suite of infection prevention and control guidelines.

Infection prevention and control education

The IPCT provided a range of education sessions to personnel on infection prevention and control programmes, procedures and practices. These included formal and informal lectures, ward and department-based education sessions and hands-on training. Additional local-based education sessions were provided in relation to transmissible infections such as CPE.

Staff were required to attend hand hygiene training and general principles of infection prevention and control at induction and every two years thereafter in line with national hand hygiene guidelines. Staff training was recorded centrally; this facilitated tracking and trending of attendance.

Inspectors were informed that 100% of consultants and non-consultant hospital doctors were up-to-date with hand hygiene training on the day of inspection. The hospital was providing positive leadership in this regard and an example for other hospitals in the hospital group and nationally.

Documentation indicated that on average 83% of nursing staff and healthcare assistants and multi-task attendants had attended mandatory hand hygiene training in the previous two year period. Local hand hygiene champions were trained on each department.

Training in relation to antimicrobial stewardship was provided to relevant clinical staff. All staff at the hospital had access to advice from the IPCT and the antimicrobial pharmacist. Clinical staff had access to advice from the clinical microbiologist as required.

Risk management

The 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 which included infection prevention and control risks. Examples of risks included some of the following:

- lack of purpose built isolation rooms in the ICU
- delay in processing blood cultures onsite between 12midnight and 8am
- non provision of *Clostridium difficile* toxin testing at the hospital resulting in turnaround time delay
- emergency department (ED) overcrowding; need for extra beds in the ED.

A number of control measures to mitigate or manage risks had been implemented. For example an extension to facilitate establishing two isolation rooms in ED and a six-bedded ward to accommodate admissions from ED had been opened since the last inspection. Additionally a design team had been engaged in relation to proposed infrastructural extensions and upgrade projects at the hospital. In the interim of any new build, a risk-based approach was taken in relation to allocation of single rooms at the hospital. Infrastructural deficiencies such as lack of isolation facilities, which could not be adequately mitigated locally had been escalated to the Saolta Health Care Hospital Group. In respect of the non-provision of *Clostridium difficile* toxin testing at the hospital a business case had been submitted to the hospital group.

A review of the corporate risk register showed that control measures in relation to a risk relating to delays in processing of blood culture samples overnight were not documented. As previously presented in section 2.1 of this report, HIQA sought

[**]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.

assurance regarding control measures put in place by the hospital to actively manage and mitigate this high risk; such assurances were provided.

Inspectors were informed that infection prevention and control risks were discussed at the hospital's infection prevention and control team, group and committee meetings as and when required. To ensure comprehensive oversight of infection prevention and control-related risks, management must ensure that risk is included as a standing agenda item at these meetings. The hospital's quality and patient safety manager provided oversight in relation to infection prevention and control risks at these meetings. New risks or issues identified at these meetings were presented by the IPCT at monthly Hospital Management Team meetings. Risk management was a standard agenda item on the hospital's Quality and Safety Committee of which membership included the IPCT.

At the time of inspection, an infection prevention and control specific risk register was being developed by the hospital outlining specific infection prevention and control risks with controls in place to mitigate against identified risks.

Inspectors were informed that infection prevention and control risks which could not be effectively mitigated at a local hospital level were escalated to the Saolta University Health Care Group Infection Prevention and Control Committee meeting and through hospital group directorate reporting structures. All healthcare-associated infection incidents were formally reported using the hospital's electronic incident management system.

Hospital staff told inspectors that feedback in relation to infection prevention and control incidents was communicated to the team by the hospital's quality and safety manager.

2.3 Infection surveillance

The hospital's infection surveillance programme included surveillance of:

- 'alert' organisms and 'alert' conditions[††]
- multidrug-resistant organisms and healthcare-associated infection
- clusters or outbreaks of infection
- bloodstream infections.

Hospital management monitored and regularly reviewed performance indicators in relation to the prevention and control of healthcare-associated infection. This was in line with HSE national reporting requirements[5] and the HSE's Business Information Unit.[6] Surveillance data was fed back at both the local hospital and Saolta University Health Care Group IPCC meetings and to the Hospital Management Team.

Data reviewed showed that the number of cases of hospital-acquired *Staphylococcus aureus* bloodstream infection and *Clostridium difficile* infection was in line with the national HSE performance indicators for February and March 2018.

A slight increase in the number of reported cases of *Clostridium difficile* infection was noted in May and August 2017 (greater than the national HSE performance indicator). Inspectors were informed that a detailed analysis showed no epidemiological link between cases. As part of the hospital's ongoing surveillance programme, the hospital undertook a systems analysis of all cases of bloodstream infections and *Clostridium difficile* infection at the hospital.

It was reported to inspectors that faecal specimens for *Clostridium difficile* testing from the hospital were sent to the microbiology laboratory at Galway University Hospital. As faecal testing was not routinely performed over weekend periods, hospital management reported that turnaround times in relation to test results could be delayed; this risk had been included on the hospital's corporate risk register. Early diagnosis of *Clostridium difficile* infection is vital for patient management and infection prevention and control.[7] As a control measure the hospital reported that patients with potentially infectious diarrhoea were isolated with transmission-based precautions while awaiting test results.

A formal legionella hospital site risk assessment had been performed in May 2017 and the hospital had arrangements put in place to have the assessment reviewed in

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

line with national guidelines.[8] Control measures in relation to water management were in place.

Invasive-device and surgical site infection surveillance

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;[9,10,11,12] this was not routinely performed at the hospital. Implementation of these infection surveillance programmes should be progressed in line with national guidelines.[9,10,11,12]

Care bundles[‡‡]

There was evidence that care bundles to prevent invasive device-related infection were implemented in both clinical areas inspected. Care bundle audit results in April 2018 in the medical ward inspected demonstrated scope for improvement in relation to care bundle implementation. Hospital staff told the inspector that a follow-up meeting coupled with an action plan to address these findings was in progress. Inspectors were informed that while no audits on care bundle compliance were completed on the ICU/CCU, the ward managers carried out informal care bundle compliance checks on a daily basis.

Inspectors reviewed a hospital care bundle audit report for 2017 and noted that compliance with documentation of care bundle elements was variable in some clinical areas. As full implementation of all evidenced-based components of care bundles have shown improved patient outcomes, the hospital needs to develop an ongoing quality improvement plan to address these deficiencies going forward.

[‡‡] A care bundle consists of a number of evidence-based practices which when consistently implemented together reduce the risk of device-related infection.

2.4 Prevention and control of healthcare-associated infections and multidrug-resistant bacteria

As with the control of all potentially transmissible infectious diseases in healthcare settings, hospital adherence to best practice in relation to transmission-based precautions is critical to protect patients and staff from colonisation and infection from such organisms. The inspection team focused on measures to prevent the spread of multidrug-resistant organisms and implementation of aspects of transmission-based precautions during this inspection.

Evidence of good practice

Antimicrobial stewardship

The hospital had a proactive antimicrobial stewardship team, programme and annual plan in place. The national guideline[13] on restricted antimicrobial agents had been implemented at the hospital. Performance and impact of the restricted antibiotic policy was audited, trended and reported. Review of antimicrobial stewardship activities was undertaken at weekly IPCT meetings. Quarterly antimicrobial reports were prepared and presented at both the hospital and hospital group IPCC meetings and the Drugs and Therapeutic Committee. Antimicrobial consumption data was also reported to the Health Protection Surveillance Centre (HPSC) for comparative analysis nationally. There was evidence that antimicrobial stewardship initiatives implemented to date had led to a reduction in spend and consumption in antimicrobial usage.

Additionally, the hospital had introduced a quarterly antimicrobial stewardship newsletter and an antimicrobial alert card which could be worn on prescriber's identification cards. This contained a summary of antimicrobial guidelines to assist prescribers in relation to antimicrobial prescribing.

Screening

- established screening[§§] practices in place were in line with national guidelines in both clinical areas inspected[3,14,15]
- routine pro-active environmental screening for CPE was undertaken and associated action plans put in place if required

[§§] Performing active surveillance cultures, active screening tests or contact screening of at-risk patients to detect colonisation with multidrug-resistant organism.

- pre-emptive screening of patients when a positive environmental CPE screen was identified
- in response to the high volume of CPE screening samples, an external laboratory had been engaged by the hospital to assist with processing of routine CPE screening samples.

Patient placement

- patient assessment to determine if previous colonisation or infection with a transmissible microorganism was undertaken at admission
- a risk-based assessment was undertaken for patients who were unsuitable for a single room facility and required transmission-based precautions
- an electronic infection prevention and control flag system to record infection status and contact with CPE electronically flagged patients
- inspectors were informed that patients colonised with CPE were cared for by designated staff at time of this inspection
- a policy of universal application of contact precautions for patients accommodated within the open plan area of the ICU/CCU had been introduced
- color-coded personal protective equipment (aprons) was available to reduce the risk of cross infection between patient zones in the ICU/CCU; each colour represented a separate patient zone.

Hand Hygiene

- the hospital achieved 90% compliance rate in the national hand hygiene audit in October/November 2017 which is in line with the current required compliance target of 90% set by the HSE
- the hospital had implemented a 'Bare Below Elbow'[***] policy in clinical areas
- essential components of the World Health Organisation (WHO) multimodal hand hygiene strategy[16] were evident.

Communication

A hospital-wide communication initiative had been implemented to increase transparency regarding the infection prevention and control programme. Trended infection prevention and control information including surveillance data was observed on notice boards around the hospital, in clinical areas inspected and on its

[***] Bare Below Elbow is an initiative aiming to improve hand hygiene performed by health care workers as the effectiveness of hand hygiene is improved when: skin is intact, nails are natural, short and unvarnished; hands and forearms are free of jewellery (one plain finger band allowed); and sleeves are above the elbow.

webpage. Performance data was openly shared with staff, patients and visitors. This demonstrates a strong focus on patient safety.

The hospital had implemented a number of practices to enhance communication in relation to infection prevention and control, for example:

- a guidance document in relation to multidrug-resistant screening requirements was available to staff
- signage to communicate isolation precautions was in place in areas inspected; doors to single rooms accommodating patients who required transmission-based precautions were closed
- patients with positive CPE screens were provided with an alert card and a letter was sent to their GP once confirmed as carrying CPE
- the hospital was currently reviewing the process for the management of patients diagnosed as CPE patient contacts after discharge from the hospital
- patient information leaflets were available for patients diagnosed with a multidrug-resistant organism including CPE
- 'golden rules' signage and information leaflets to communicate infection prevention and control best practice guidelines for visitors were available
- a direct access staff engagement forum chaired by a hospital consultant, reported to the Hospital Management Team on a monthly basis.

Hospital environment and patient equipment hygiene

- the environment and patient equipment hygiene on both clinical areas inspected were generally clean with few exceptions
- the hospital had a defined hygiene auditing schedule overseen by the hygiene services supervisor and the Hygiene Services Committee
- associated action plans identified corrective actions taken to address any deficiencies identified in hygiene audits
- a representative from the external contract cleaning company attended the Hygiene Services Committee meeting
- hydrogen peroxide vapour[†††] was implemented in isolation rooms on discharge of a known positive CPE patient
- a defined cleaning schedule and cleaning processes for patient equipment and a green tagging system to alert staff when equipment was last cleaned was in operation in the medical ward inspected.

[†††] Hydrogen peroxide vapour is a substance that destroys or eliminates all forms of microbial life in the inanimate environment, including all forms of vegetative bacteria, bacterial spores, fungi, fungal spores, and viruses.

Outbreak management

Documentation reviewed by inspectors showed that the hospital had one outbreak of norovirus in August 2017. Hospital staff reported that there had been no outbreak of infection at the hospital to date in 2018. In light of dated infrastructure, lack of isolation rooms and multi-occupancy rooms, this achievement shows that control measures to date to address infrastructural deficiencies had been effective.

Opportunities for improvement

Hospital management had identified a number of deficiencies in effective infection prevention and control. These included:

Infrastructure

- dated infrastructure was not in line with recommended specifications of modern care facilities in both areas inspected[17,18,19]
- insufficient number of single rooms with en-suite facilities; delays in relation to diagnostic turnaround times for externally processed screening samples placed additional pressure on isolation facilities as patients were pre-emptively isolated whilst awaiting results
- the hospital regularly operated over capacity; a patient was boarded on a ward corridor in one clinical area inspected
- the ICU/CCU did not have isolation facilities with specialised ventilation required for managing patients with airborne infection.

Screening

- technology to support quick turnaround times for high risk CPE screening samples was not available at the hospital.

Hospital environment and patient equipment hygiene

- results of an infection prevention and control environmental hygiene audit did not achieve the target set by the hospital in both clinical areas inspected in March 2018; audit results suggest that a review of cleaning resources and schedules is required
- an overview environmental hygiene audit report for 2017-2018 showed some clinical areas had not achieved compliance with the target set by the hospital
- increased oversight of cleaning of shelved storage in the ICU/CCU is recommended

- management reported that resources in the maintenance team were inadequate; this needs to be addressed as maintenance issues negatively impact on overall hygiene audit findings
- equipment cleaning schedules viewed in the ICU/CCU did not accurately reflect the activity or equipment found on unit and were not aligned with recommended national minimum cleaning frequencies for higher risk areas[20,21]
- a green tagging system which alerted staff to when the equipment was last cleaned was in use at the hospital, however this system had not been introduced in the ICU/ CCU at the time of inspection.

Inspectors found evidence of the following which require review by management:

- inconsistent application of the 'Bare Below Elbow'[‡‡‡] policy among some clinicians
- scope for improvement in relation to the latest hand hygiene audit in the medical ward inspected
- a number of used disposable blood pressure cuffs on blood pressure monitors; these cuffs should be dedicated single patient use and disposed of after single patient use; blood pressure cuffs have been associated with potential sources of cross contamination[22]
- while patients in isolation had their own blood pressure cuff, designated blood pressure monitors were not available for isolation rooms
- management need to risk assess staff practice of emptying contents of bedpans into a sluice hopper prior to being placed in a washer disinfector
- nursing admission, transfer and referral documentation contained an infection status section however prompts for staff in relation to screening could be expanded to reflect the latest guidance in relation to CPE.

[‡‡‡] Bare Below Elbow is an initiative aiming to improve hand hygiene performed by health care workers as the effectiveness of hand hygiene is improved when: skin is intact, nails are natural, short and unvarnished; hands and forearms are free of jewellery (one plain finger band allowed); and sleeves are above the elbow.

3.0 Conclusion

HIQA found that Mayo University Hospital had made significant progress since the last inspection and is continually improving infection prevention and control practices. Hospital management stated that screening for CPE was in line with the latest national guidance; a critical prevention and control measure in light of the National Public Health Emergency in relation to CPE. The hospital had identified a high risk in relation to blood cultures not being processed between 12midnight and 8am at the hospital. In response to HIQA's seek assurance letter, the general manager identified controls and key actions implemented to manage this risk.

The hospital had many elements of an infection prevention and control programme which included some of the following:

- strengthened governance and management arrangements
- additional resources allocated to the Infection Prevention and Control Team
- systems in place to identify and manage incidents and risk pertaining to infection prevention and control
- ongoing monitoring of infection prevention and control process and outcome measures
- a structured antimicrobial stewardship programme
- compliance with the HSE's national performance indicator for hand hygiene
- 100% of consultants and non-consultant hospital doctors at the hospital were up-to-date with hand hygiene training.

Following this inspection, management need to review existing laboratory resources to support the processing of overnight blood cultures and processing of all CPE screening samples and faecal specimen tests at the hospital. The hospital monitored compliance with healthcare-associated infection key performance indicators however invasive-device related and surgical site infection surveillance programmes require progression.

Overall the hospital environment and patient equipment on both clinical areas inspected was generally clean. The hospital had a comprehensive environment and patient equipment hygiene auditing schedule in place and with this in mind hospital management must be assured that audit methodologies are reliable. Older and poorly designed hospital infrastructure makes cleaning more difficult; this coupled with audit findings, needs to be taken into consideration when allocating resources.

Full implementation of all evidenced-based components of care bundles have shown improved patient outcomes; the hospital needs to progress this. Mayo University

Hospital was endeavouring to fully implement the *National Standards for the prevention and control of healthcare-associated infections in acute healthcare services*. The hospital has made positive progress in relation to infection prevention and control since the last inspection. As part of the wider hospital group the hospital will need continued support.

4.0 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. [Online]. Available online from: http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/strategyforthecontrolofantimicrobialresistanceinirelandsari/carbapenemresistantenterobacteriaceaecre/guidanceandpublications/

4. Health Service Executive. HSE National Framework for developing Policies, Procedures, Protocols and Guidelines (PPPGs). Health Service Executive; December 2016. [Online]. Available online from: http://www.hse.ie/eng/about/Who/QID/Use-of-Improvement-Methods/nationalframeworkdevelopingpolicies/HSE-National-Framework-for-Developing-Policies-Procedures-Protocols-and-Guidelines-PPPGs-2016.pdf

5. Health Service Executive. *National Service Plan 2018.* [Online]. Available online from: https://www.hse.ie/eng/services/publications/serviceplans/national-service-plan-2018.pdf

6. Carbapenemase producing *Enterobacterales* (CPE) in HSE acute hospitals. Monthly report for the National Public Health Emergency Team (NPHET) April 2018. [Online]. Available online from: http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/strategyforthecontrolofantimicrobialresistanceinirelandsari/carbapenemresistantenterobacteriaceaecre/surveillanceofcpeinireland/cpemonthlysurveillancereports/NPHET_CPE_March%202018%20v1.0%206%204%2018.pdf

7. Department of Health. National Clinical Effectiveness Committee. Diagnosis and Management of Clostridium difficile Infection in Ireland. National Clinical Guideline No. 3, 2014. Available online from: http://www.hpsc.ie/A-Z/Gastroenteric/Clostridiumdifficile/Guidelines/File,13950,en.pdf

8. Health Protection Surveillance Centre. National Guidelines for the Control of Legionellosis in Ireland, 2009. Report of Legionnaires Disease Subcommittee of the Scientific Advisory Committee. [Online]. Available from: http://www.hpsc.ie/AboutHPSC/ScientificCommittees/Publications/File,3936,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. Royal College of Physicians of Ireland. Prevention of Intravascular Catheter-related Infection in Ireland. Partial update of 2009 National Guidelines. 2014. [Online]. Available online from: http://www.hpsc.ie/A-Z/Hepatitis/GuidanceforRenalUnits/File,4115,en.pdf

12. Royal College of Physicians of Ireland/Royal College of Surgeons in Ireland. Preventing Surgical Site Infections: Key Recommendations for Practice. Dublin: Joint Royal College of Surgeons in Ireland/Royal College of Physicians of Ireland Working Group on Prevention of Surgical Site Infections; 2012. [Online]. Available online from: https://rcpi-live-cdn.s3.amazonaws.com/wp-content/uploads/2016/01/Preventing-Surgical-Site-Infections-Key-Recommendations-for-Practice.pdf

13. Health Service Executive. National Policy on Restricted Antimicrobial Agents. Health Service Executive; 2016. [Online]. Available online from:

https://www.hse.ie/eng/about/who/qid/nationalsafetyprogrammes/hcaiamr/hse-policy-on-restricted-antimicrobials-july-2016.pdf

14. 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

15. 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

16. World Health Organization. A Guide to the Implementation of the WHO Multimodal Hand Hygiene Improvement Strategy. Revised August 2009. [Online]. Available from: http://www.who.int/gpsc/5may/tools/system_change/en/

17. Department of Health, United Kingdom. Health Building Note 00-09: Infection control in the built environment . 2013. [Online]. Available online from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/170705/HBN_00-09_infection_control.pdf.

18. Health Protection Surveillance Centre. Infection Prevention and Control Building Guidelines for Acute Hospitals in Ireland Strategy for the control of Antimicrobial Resistance in Ireland (SARI) Dublin: Health Protection Surveillance Centre; 2008. [Online]. Available online from: https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File,3439,en.pdf

19. Department of Health, United Kingdom. Health Building Note 00-02 Critical care Units. Department of Health, United Kingdom, 2013. [Online]. Available online from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/147865/HBN_04-02_Final.pdf

20. National Hospitals Office, Quality, Risk & Customer Care. HSE Cleaning Manual Acute Hospitals. September 2006 . [Online]. Available from:

http://hse.ie/eng/services/publications/Hospitals/HSE_National_Cleaning_Standards_Manual.pdf

21. National Hospitals Office, Quality, Risk & Customer Care. HSE National Cleaning Manual Appendices. September 2006. [Online]. Available from: http://www.hse.ie/eng/services/publications/hospitals/HSE_National_Cleaning_Standards_Manual_Appendices.pdf

22. Matsuo M, Oie S, Furukawa H. Contamination of blood pressure cuffs by methicillin-resistant Staphylococcus aureus and preventive measures. Irish Journal of Medical Science. 2013. Dec; 182(4): 707-9. [Online]. Available online from: https://www.ncbi.nlm.nih.gov/pubmed/23639972

5.0 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

Appendix 2: Copy of the letter issued to Mayo University Hospital regarding the high risk identified during HIQA's inspection at Mayo University Hospital

Catherine Donohue
General Manager
Mayo University Hospital
Castlebar
Co Mayo

catherine.donohoe@hse.ie

16 May 2018

Ref: PCHCAI 2018/30

Dear Catherine

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

The Health Information and Quality Authority (HIQA) carried out an unannounced inspection at Mayo University Hospital, Castlebar against the *National Standards for the prevention and control of healthcare-associated infections in acute healthcare services* on 15 May 2018.

During the course of the inspection inspectors were informed by hospital management that the hospital had identified a high risk in relation to blood cultures not being processed between 12 midnight and 8am at the hospital.

On review of inspection findings we are writing to seek assurance in relation to how the hospital is actively managing this high risk and to identify what controls were put in place by the hospital to mitigate this risk.

Please outline what mitigating actions the hospital has put in place to address this high risk which had been identified by the hospital prior to this inspection. Details of the high risk identified by the hospital and mitigating actions put in place by the hospital will be included in the report of this inspection.

Please provide this assurance to HIQA by close of business on **23 May 2018** to qualityandsafety@hiqa.ie. Should you have any queries, please do not hesitate to contact me at qualityandsafety@hiqa.ie.

Yours sincerely,

Noreen Flannelly-Kinsella

Noreen Flannelly-Kinsella
Authorised Person

CC: Maurice Power, CEO, Saolta University Health Care Group

Appendix 3: Copy of the response letter received from Mayo University Hospital regarding the high risk identified during the HIQA inspection of Mayo University Hospital

Saolta
Grúpa Ollscoile Cúram Sláinte
University Health Care Group

Western Area,
Health Service Executive,
Mayo University Hospital,
Castlebar,
Co. Mayo,
Ireland,
F23 H529.

Tel: (094) 9042000
Fax: (094) 9021454

24th May 2018

Noreen Flannelly-Kinsella
HIQA
Unit 1301,
City Gate,
Mahon,
Cork, T12 Y2XT

Dear Noreen,

Please find attached the risk management plan in relation to blood cultures management between midnight and 8am in Mayo University Hospital.

There are a number of items which are for discussion and decision at our next Laboratory Directorate meeting. Following a review of three months of data the risk register rating has been reduced to 12. This should have been updated on the hospital risk register following the Laboratory Directorate meeting on 10th May 2018.

There is an addition to be made at the June directorate meeting which will incorporate at a minimal on site visit once a night to ensure that the uploading and the reading of positive cultures takes place.

If you require further clarity on this, please do not hesitate to contact me.

Kind Regards,

Catherine Donohoe
General Manager
Mayo University Hospital

Appendix 4: Copy of the risk management plan received from Mayo University Hospital regarding the high risk identified during the HIQA inspection of Mayo University Hospital

Risk Assessment Form

Division:	Acute Hospitals Division	Source of Risk:	Blood Culture Testing
HG/CHO/NAS/Function:	Saolta	Primary Impact Category:	Patient Care and Safety
Hospital Site/Service:	Mayo University Hospital	Secondary Impact Category(s):	Delivery of Care
Dept/Service Site:	Microbiology Laboratory	Name Risk Owner: (BLOCKS)	Dr S Sibartie
Date of Assessment:	June 2014 (original risk identification)	Signature of Risk Owner:	
Unique ID No:			

RISK DESCRIPTION	Impacts/Vulnerabilities	EXISTING CONTROL MEASURES	ADDITIONAL CONTROLS REQUIRED	PERSON RESPONSIBLE FOR ACTION	DUE DATE
The current 'Irish Guideline for the Investigation of Blood Culture Samples' states within Its recommendations that A)" Turn Around Time for loading of Blood Cultures is < 4 hours from collection" this is currently not being met between 12midnight and 8am. B) " Once a positive flag is noted, subculture without delay" - this is currently not being met	A & B: A delay in the blood culture process for positive blood cultures (e.g. the gram stain, preliminary identification of organism and antibiotic susceptibility, final identification of organism and antibiotic susceptibility) in Instance where it occurs between 12 midnight and 8am This delay may impact on patient care as e.g. a gram stain might influence antimicrobial prescribing or precipitate discussion with the clinical microbiologist.	1. Permanent Consultant Microbiologist since Sep 2016 providing 24/7 clinical advice. 2. Microbiology lab staff are on call from home 12midnight to 8 am blood culture bottles are loaded during that time if staff are present onsite after 12midnight or before 8 am. doing on call work.This was 17% of post midnight hours in Dec 2017 and 10 % for January and Feb 2018. 3. Antimicrobial Guidelines are available to clinicians for the	In order to adhere to the recommendations of 'Irish Guideline for the Investigation of Blood Culture Samples' it would be necessary to process Blood cultures between 12midnight and 8 am (loading and work up). Update 10th May 2018 Measures to be explored: 1. Biochem/Haem/ porters to load blood cultures and Micro staff to be called in for positive blood cultures (Link from the blood culture instrument to a lab mobile phone needs to be	CD/RR/FB Via lab directorate RR/SS/CB	Update 14th June 2018 Directorate meeting in June 2018 decision to be agreed regarding 1 - 5.

Risk Assessment Form

between 12midnight and 8am		treatment of most emergencies e.g. sepsis, meningitis thereby preventing treatment delay. 4. Most blood cultures do not influence patient management but are helpful to guide treatment. Contamination of blood cultures can also result in over-treatment of patients. An audit conducted over 3 months (Dec 2017 to Feb 2018) looking at the positive blood cultures between midnight and 8am, identified 2 cases (out of 39) where knowing the gram stain earlier could possibly have resulted in a change of antibiotic prescribing. However this would not likely have changed the clinical outcome.	set up) 2. Providing onsite microbiology staff from midnight to 8am 3. Microbiology staff to come in routinely at 4am to load and work up blood cultures. 4. At present Microbiology staff are on call from home during the hours (midnight to 8 am) and are called in to process samples e.g. CSF and Urines . This practice could also include processing of positive blood cultures. 5. Ringing lab staff to process blood cultures between midnight to 8 am could be included In sepsis management at ward level.		

INITIAL RISK RATING		
Likelihood	Impact	Risk
4 (Based on audit over a 3-,month period- 2cases. 12 months we would expect 8 cases - >bimonthly)	3 (moderate as blood culture results themselves are not the only diagnostics influencing patient treatment, i.e other measures in place)	12

*One risk per form

RISK STATUS		
Open	Monitor	Closed

HSE Integrated Risk Management Policy, March 2017 Part 2. Risk Assessment and Treatment- Guidance for Managers

For further information please contact:

Health Information and Quality Authority
Dublin Regional Office
George's Court
George's Lane
Smithfield
Dublin 7

Phone: +353 (0) 1 814 7400
Email: qualityandsafety@hiqa.ie
URL: www.hiqa.ie