



**Health
Information
and Quality
Authority**

An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

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

Monitoring programme for unannounced inspections undertaken
against the National Standards for the Prevention and Control of
Healthcare Associated Infections

Date of on-site inspection: 19 April 2016

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 and support services in Ireland. HIQA's role is to develop standards, inspect and review health and social care and support services, and support informed decisions on how services are delivered. HIQA's ultimate aim is to safeguard people using services and improve the quality and safety of 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 the Minister for Children and Youth Affairs, the Health Information and Quality Authority 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 and support services in Ireland.
- **Regulation** – Registering and inspecting designated centres.
- **Monitoring Children's Services** – Monitoring and inspecting children's social services.
- **Monitoring Healthcare Quality and Safety** – Monitoring the quality and safety 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 and support services.

Table of Contents

1. Introduction	1
2. Findings	2
2.1 Progress since the last unannounced inspection on 26 February 2015 ..	3
2.2 Key findings of the unannounced inspection on 19 April 2016	4
2.3 Key findings relating to hand hygiene	6
2.4 Key findings relating to infection prevention care bundles	9
3. Summary	11
4. Next steps	11
5. References	13

1. Introduction

The Health Information and Quality Authority (HIQA) carries out unannounced inspections in public acute hospitals in Ireland to monitor compliance with the National Standards for the Prevention and Control of Healthcare Associated Infections.¹ The inspection approach taken by HIQA is outlined in guidance available on the HIQA's website, www.hiqa.ie – *Guide: Monitoring Programme for unannounced inspections undertaken against the National Standards for the Prevention and Control of Healthcare Associated Infections*.²

The aim of unannounced inspections is to assess hygiene in the hospital as observed by the inspection team and experienced by patients at any given time. They focus specifically on the observation of the day-to-day delivery of services and in particular environment and equipment cleanliness and compliance with hand hygiene practice. In addition, following the publication of the 2015 *Guide: Monitoring Programme for unannounced inspections undertaken against the National Standards for the Prevention and Control of Healthcare Associated Infections*,² HIQA assesses the practice in the implementation of infection prevention care bundles. In particular this monitoring focuses on peripheral vascular catheter and urinary catheter care bundles, but monitoring of performance may include other care bundles as recommended in prior national guidelines^{3,4} and international best practice.⁵

Assessment of performance focuses on the observation of the day-to-day delivery² of hygiene services, in particular environmental and hand hygiene and the implementation of care bundles for the prevention of device related infections under the following Standards:

- Standard 3: The physical environment, facilities and resources are developed and managed to minimise the risk of service users, staff and visitors acquiring a Healthcare Associated Infection.
- Standard 6: Hand hygiene practices that prevent, control and reduce the risk of spread of Healthcare Associated Infections are in place.
- Standard 8: Invasive medical device related infections are prevented or reduced.

Other Standards may be observed and reported on if concerns arise during the course of an inspection. It is important to note that the Standards are not assessed in their entirety during an unannounced inspection and therefore findings reported are related to a particular criterion within a Standard which was observed during an inspection. HIQA uses hygiene observation tools to gather information about the cleanliness of the environment and equipment as well as monitoring hand hygiene practice in one to three clinical areas depending on the size of the hospital. HIQA's

approach to an unannounced inspection against these Standards includes provision for re-inspection within six weeks if Standards on the day of inspection are poor.

This aims to drive improvement between inspections. In addition, in 2016, unannounced inspections will aim to identify progress made at each hospital since the previous unannounced inspection conducted in 2015.

An unannounced inspection was carried out at St Michael's Hospital on 19 April 2016 by Authorized Persons (Inspectors) from HIQA, Katrina Sugrue and Noreen Flannelly-Kinsella between 10.20hrs and 16.40hrs. The area assessed was:

- The Male Floor, a 28-bedded surgical and medical ward, which comprises two five-bedded rooms, three four-bedded rooms and six single rooms. This floor also accommodates an additional nine beds which are used for Emergency Department patients as required. These beds were vacant at the time of inspection.
- In addition, St Joseph's Ward, inspected during an unannounced inspection by HIQA on 26 February 2015, was re-visited to assess the level of progress which had been made after the 2015 inspection.
- The central location for household cleaning equipment, storage of trolleys and laundering of household textiles, was also visited.

HIQA would like to acknowledge the cooperation of staff with this unannounced inspection.

2. Findings

This report outlines HIQA's overall assessment in relation to the inspection and includes key findings of relevance. A list of additional low-level findings relating to non-compliance with the Standards has been provided to the hospital for inclusion in local quality improvement plans. However, the overall nature of the key areas of non-compliance are within this report.

This report is structured as follows:

- **Section 2.1** outlines the level of progress made by St Joseph's Ward after the unannounced inspection on 26 February 2015.
- **Section 2.2** presents the key findings of the unannounced inspection on 19 April 2016.
- **Section 2.3** describes the key findings relating to hand hygiene under the headings of the five key elements of the World Health Organization (WHO) multimodal improvement strategy⁶ during the unannounced inspection on 19 April 2016.

- **Section 2.4** describes the key findings relating to infection prevention care bundles during the unannounced inspection on 19 April 2016.

2.1 Progress since the last unannounced inspection on 26 February 2015

HIQA reviewed the quality improvement plan (QIP)⁷ published by St Michael's Hospital following the February 2015 inspection. The hospital has taken on board the recommendations of the 2015 report and is working towards improving the general facilities and clinical environment throughout the hospital. The level of progress made was evident on the day of inspection. For example, there is an ongoing continuous hospital programme for painting, refurbishment of wheels on equipment and seating and replacement of waste bins. In addition, progress has been noted in the replacement of clinical hand wash sinks in patient areas to ensure compliance with HBN 00-10 standards¹⁴ and also with the refurbishment of bathrooms.

Following the last inspection in 2015, the hospital has conducted an audit of all mattresses and cushion upholstery in the hospital and to date, 50 mattresses have been replaced and 36 electronic beds with mattresses have been purchased. However, regular checks of mattress covers and cores was not in place at the time of the inspection which is recommended.

Inspectors visited St Joseph's Ward which was inspected during the unannounced inspection in 2015. Environmental hygiene audits are performed twice a year and authorized persons were informed that the most recent environmental hygiene audit result showed 95% compliance with desired standards in January 2016. Compliance scores were available to the Hospital Management Team. However, only a detailed list of the non-compliances with action plans is available to the managers. Therefore there is a lack of awareness regarding the overall level of compliance and ongoing trends at ward level.

It was evident that progress has been made with regard to cleaning records for patient equipment in St Joseph's Ward. Inspectors noted that check lists had been revised and now include an itemized list of patient equipment for both the morning and afternoon sessions for day procedures. Since the last inspection, water flushing records have improved on St Joseph's Ward. The hospital has continued to deliver targeted education on *Apergillosis* and *Legionella* control, and 92 staff including clinical, non-clinical and contractors, have attended training up to April 2016.

2.2 Key findings of the unannounced inspection on 19 April 2016

Patient equipment and environmental hygiene

Opportunities for improvement in the management and cleanliness of the environment and patient equipment were observed during the inspection of the Male Floor.⁸

Insufficient cleaning of frequently used patient equipment such as glucose monitor holders and temperature probe holders was observed at the time of the inspection. Red staining was visible on one glucose monitor holder indicating that the holder, with supplies for blood sampling, was brought to the patient bedside. Only the equipment required for one patient and one procedure should be brought to the point-of-care.

Organic matter was present on a wall in an isolation room, on a shower curtain, on the undersurface of two shower chairs and the surface of a waste bin. This is of particular concern as it presents a risk of contamination within the patient environment.^{1, 8} Brown staining was observed on the undersurface of one patient armchair inspected. Details of these risks were communicated to the manager and were addressed at the time of the inspection. In addition, improvement in dust control measures is required in the environment and with some patient equipment.

In the clean utility room, the storage of sterile items was not in line with best practice guidelines. Intravenous fluids were stored under the clinical hand hygiene sink whilst other sterile supplies were stored in open shelving. Sterile items should be stored in fully enclosed storage units or cupboards in order to prevent inadvertent contamination.

Sink outlet inserts were unclean in a number of clinical hand wash sinks inspected which may pose a risk of contamination with pathogens such as *Pseudomonas aeruginosa*.⁹ It is important that, in accordance with national guidelines, the hospital ensures that there is a regular documented cleaning, decontamination and maintenance schedule for all water outlets and accessories.¹⁰

Excess items and patient equipment were stored on a communal corridor on the ward. Much of the equipment viewed were uncovered and were dusty. HIQA was informed by hospital management that plans to develop an equipment library were underway to address the storage of excess equipment and will be progressed.

Daily cleaning records for patient equipment viewed were incomplete which is consistent with the findings on the day of the inspection. HIQA recommends that the cleaning and disinfection of patient equipment is reviewed and monitored at a

management level to ensure compliance and to reduce the risks of patients acquiring a Healthcare Associated Infection.

Hospital hygiene plays an important role in the prevention and control of Healthcare Associated Infections and should be a key priority for all healthcare organisations. A clean environment not only reduces the risk of acquiring an infection but also promotes patient and public confidence and demonstrates the existence of a positive safety culture.¹¹

Safe injection practice

Safety cannulas were in place but needles without safety mechanisms were in use at the time of the inspection. Inspectors were informed that the hospital is currently working towards compliance with the EU Sharps Directive and Regulations 2010/32/EU.16.¹² Inspectors observed that a medication fridge, in the nurse's office, was unlocked and unclean. This should be included in the ward cleaning schedule and should be locked to prevent unauthorized access.

Bed Spacing

Inspectors observed that the bed spacing in a five-bedded room was not ideal. There was limited space for patients to sit out or for staff to circulate or manoeuvre patients or equipment. It was reported that there were an additional nine vacant beds available for emergency patients. The decision not to utilise this additional capacity represents a missed opportunity to increase spatial separation between patients. The hospital needs to review their processes to ensure that capacity is utilised appropriately to balance the associated risks. Treatment of patients in close proximity to each other increases the risk of spread of many infections including those caused by multi drug resistant organisms. A risk-based approach should be taken to ensure that the environment is appropriate for carrying out clinical activities and undertaking manual handling operations while maintaining a good standard of infection control.¹³

Management of cleaning equipment

The central location for laundering of textiles and for storage of cleaning solutions and equipment is inappropriate and does not support the functional separation of the clean and dirty phases of the laundering process. This is a similar finding to the 2013 unannounced inspection and remains unresolved. HIQA recommends that the suitability of this area is reviewed in the context of an infection prevention and control risk assessment. Inspectors observed that this area was to be addressed and is included on the hospital's Quality Improvement Plan for 2016.

2.3 Key findings relating to hand hygiene

2.3.1 System change⁶ : *ensuring that the necessary infrastructure is in place to allow healthcare workers to practice hand hygiene.*

- The clinical hand wash sinks observed in the patient room areas conformed with Health Building Note 00-10 Part C: Sanitary assemblies.¹⁴ However, the clinical hand wash sink in the clean utility room did not comply with the required standard.
- There was no designated clinical hand wash sinks¹⁴ in the isolation rooms.

2.3.2 Training/education⁶ : *providing regular training on the importance of hand hygiene, based on the 'My 5 Moments for Hand Hygiene' approach, and the correct procedures for handrubbing and handwashing, to all healthcare workers.*

- St Michael's Hospital provides mandatory hand hygiene training to all staff on a yearly basis which is over and above the national recommendation of two yearly training.
- High compliance in hand hygiene training was demonstrated in the Male Floor with 100% staff trained in 2016. All staff were also up-to-date with transmission-based precaution training.
- Staff are notified by the Infection Prevention and Control Team when training is required.
- Inspectors were informed that additional training is provided by the Infection Prevention and Control Team on standard and transmission-based precautions, multi-drug resistant organisms and intravenous care and aseptic techniques.

2.3.3 Evaluation and feedback⁶: *monitoring hand hygiene practices and infrastructure, along with related perceptions and knowledge among health-care workers, while providing performance and results feedback to staff.*¹⁵

National hand hygiene audits

- St Michael's Hospital participates in the national hand hygiene audits which are published twice a year. Compliance for May/June 2015 achieved the Health Service Executive's (HSE) national target of 90% and compliance for Oct/Nov 2015 achieved 89.5%. An overview of St Michael's Hospital national hand hygiene audit results are presented in Table 1 overleaf.

Table 1: St Michaels Hospital national hand hygiene audit results.

Period 1-10	Result
Period 1 March/April 2011	83.3%
Period 2 October/November 2011	81.4%
Period 3 May/June 2012	85.9%
Period 4 Oct/Nov 2012	85.1%
Period 5 May/June 2013	89.0%
Period 6 Oct/Nov 2013	90.0%
Period 7 May/June 2014	89.0%
Period 8 Oct/Nov 2014	89.5%
Period 9 May/June 2015	90.0%
Period 10 Oct/Nov 2015	89.5%

Source: Health Protection Surveillance Centre – national hand hygiene audit results.¹⁶

Local hand hygiene audits

- Documentation viewed demonstrated that hospital wide local hand hygiene audits are carried out regularly. St Joseph's Ward demonstrated 100% compliance in an audit conducted in February 2016. Hand hygiene audits conducted in the Male Floor showed 60% compliance in October 2015 and improved compliance of 100% and 88% in February and March 2016 respectively.
- A hospital audit of hand hygiene standards carried out in October 2015 achieved an overall 89.6% compliance and November 2015 achieved overall 75%. A slight increase was noted in February 2016 where compliance achieved 78%.
- Inspectors noted the sample size for hospital wide hand hygiene audits included 40 to 59 opportunities, and therefore below the recommendations of 30 opportunities per ward/unit.¹⁷ Small sample size may inadvertently misrepresent the overall compliance across the hospital.

Observation of hand hygiene opportunities

Authorized persons observed hand hygiene opportunities using a small sample of staff in the inspected areas. This is intended to replicate the experience at the individual patient level over a short period of time. It is important to note that the results of the small sample observed is not statistically significant and therefore results on hand hygiene compliance do not represent all groups of staff across the hospital as a whole. In addition results derived should not be used for the purpose of external benchmarking.

The underlying principles of observation during inspections are based on guidelines promoted by the WHO¹⁸ and the HSE.¹⁹ In addition, authorized persons may observe other important components of hand hygiene practices which are not reported in national hand hygiene audits but may be recorded as optional data. These include the duration, technique^γ and recognised barriers to good hand hygiene practice. These components of hand hygiene are only documented when they are clearly observed (uninterrupted and unobstructed) during an inspection. Such an approach aims to highlight areas where practice could be further enhanced beyond the dataset reported nationally.

HIQA observed 19 hand hygiene opportunities in total during the inspection. Hand hygiene opportunities observed comprised the following:

- seven before touching a patient
 - one before clean/aseptic procedure
 - two after body/fluid exposure risk
 - four after touching a patient
 - five after touching patient surroundings.
- 13 of the 19 hand hygiene opportunities were taken. The six opportunities which were not taken comprised the following:
- four before touching a patient
 - one before clean/aseptic procedure
 - one after body/fluid exposure risk
- Of the 13 opportunities which were taken, the hand hygiene technique was observed (uninterrupted and unobstructed) by the authorised persons for 12 opportunities and the correct technique was observed in 12 hand hygiene actions.

^γ The inspectors observe if all areas of hands are washed or alcohol hand rub applied to cover all areas of hands.

In addition the authorized persons observed:

- A wrist watch was worn by a member of the healthcare team while attending to patients.
- The majority of healthcare workers complied with 'bare below the elbow' in the clinical areas although there is no hospital policy.

2.3.4 Reminders in the workplace⁶: *prompting and reminding healthcare workers about the importance of hand hygiene and about the appropriate indications and procedures for performing it.*

- Hand hygiene advisory posters were available, up-to-date, clean and appropriately displayed on the Male Floor.
- Patient hand hygiene information leaflets were available on the Male Floor however inspectors observed that patients had not received these leaflets at the time of the inspection.

2.3.5 Institutional safety climate⁶: *creating an environment and the perceptions that facilitate awareness-raising about patient safety issues while guaranteeing consideration of hand hygiene improvement as a high priority at all levels.*

- St Michael's Hospital achieved 90.0% compliance in May/June 2015 national hand hygiene audit which is in line with the HSE's national target. The hospital achieved 89.5% compliance in October/November 2015.¹⁶
- On Male Floor, hand hygiene audit results are displayed on notice boards and discussed at ward meetings and documented in the ward communication book.
- Hand hygiene audit results are discussed at monthly Infection Prevention and Control Team meetings.
- The hospital has demonstrated a commitment to improve hand hygiene practice at all levels. Measures implemented to build on hand hygiene compliance achieved to date should be continued and improved to ensure that good hand hygiene compliance is achieved and maintained across all clinical areas.

2.4 Key findings relating to infection prevention care bundles*

Care bundles to reduce the risk of different types of infection have been introduced across many health services over the past number of years, and there have been a number of guidelines published in recent years recommending their introduction across the Irish health system.

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

Authorized persons reviewed documentation and practices and spoke with staff relating to infection prevention care bundles in the areas inspected and visited. Overall, peripheral vascular catheter (PVC) care bundles have been well advanced over the past two years. The hospital is currently undertaking a trial of a revised PVC care bundle. Audit of maintenance care bundle compliance and feedback systems around the implementation of peripheral vascular catheter was evident through discussion with the manager and hospital management. The results of a recent audit on the Female Floor demonstrated 87% compliance and the High Dependency Unit (HDU) demonstrated 100% compliance with the elements of the PVC care bundle.

Care bundles for urinary catheters were also in place and inspectors were informed that auditing of compliance has commenced. The results of a recent urinary catheter audit on the Female Floor and HDU showed 100% compliance. Results of audits are communicated to ward managers and to staff through team meetings and on ward folders. Inspectors were informed that the hospital is progressing towards the introduction of Quality Care Nursing Metrics[†] throughout the hospital. St Michael's Hospital needs to continue to build on the progress to date to fully embed infection prevention care bundle audit into routine practice in the best interest of patients.

Monitoring compliance with care bundles is an important process measure for evaluation of a catheter-related bloodstream infection (CRBSI) preventative programme.²⁰ Catheter-related bloodstream (CRBSI) infection surveillance is conducted in the hospital and remain as agenda items on the monthly Infection Prevention and Control Team meetings. Inspectors were informed that data from Meticillin-Resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* surveillance is communicated to staff from the Infection Prevention and Control Team. St Michael's Hospital key performance indicators for MRSA bloodstream infection and *Clostridium difficile* were in line with the national Health Service Executive (HSE) key performance indicators for quarter two 2015.²¹ As recommended in national guidelines, ongoing quality assurance/improvement, risk management and surveillance programs should be in place to monitor the incidence of infection associated with intravascular catheters.

Surgical Site infections²² represent one of the most common categories of healthcare associated infections (HCAI). St Michael's Hospital is undertaking surgical site surveillance of post-operative surgical site infections in patients following a number of different surgical procedures which is to be commended. Surveillance

[†] Quality Care-Metrics are a measure of the quality of nursing and midwifery clinical care processes, in healthcare settings aligned to evidenced based standards and agreed through national consensus. Measurement of Care-Metrics is done online. This allows monthly data collection and reporting on safety and quality care-metrics across HSE services in Ireland.

with feedback of information to surgeons and other relevant staff followed by initiation of reciprocal quality improvement initiatives has been shown to be an important element in the overall strategy to reduce the incidence of surgical site infections. Surgical site surveillance is also important to identify emerging resistance in common pathogens or multi resistant organisms.

3. Summary

HIQA found that progress has been made since the last inspection with regard to the hospital infrastructure and refurbishment programme and is commendable.

Opportunities for improvement are required in the cleanliness of the environment and the cleanliness and storage of patient equipment. The hospital needs to progress with the proposal of an equipment library and continue to build on the ongoing environmental hygiene audits and monitoring of compliance to date.

Overall, the laundering facility for reusable cleaning textiles and the processes in place during the inspection posed a risk of inadvertent environmental contamination of the cleaning textiles used in clinical areas within the hospital. The laundering processes for hospital cleaning textiles in this areas should be revised as a matter of priority.

The hospital has demonstrated a commitment to promoting best practices in hand hygiene and is working towards improving compliance to maintain the HSE's national compliance target of 90%.

HIQA notes the progress with regard to the implementation and auditing of infection prevention and control care bundles. St Michael's Hospital has demonstrated that it is working towards compliance with Standard 8 of the Infection Prevention and Control Standards¹ and is committed to improving the management of invasive devices. The hospital should continue to build on the overall progress to date.

4. Next steps

St Michael's Hospital must now revise and amend its quality improvement plan (QIP) that prioritises the improvements necessary to fully comply with the Standards. This QIP must be approved by the service provider's identified individual who has overall executive accountability, responsibility and authority for the delivery of high quality, safe and reliable services. The QIP must be published by the hospital on its website within six weeks of the date of publication of this report and at that time, provide HIQA with details of the web link to the QIP.

It is the responsibility of St Michael's Hospital to formulate, resource and execute its QIP to completion. HIQA will continue to monitor the hospital's progress in implementing its QIP, as well as relevant outcome measurements and key

performance indicators. Such an approach intends to assure the public that the hospital is implementing and meeting the Standards, and is making quality and safety improvements that safeguard patients.

5. References[‡]

- 1 Health Information and Quality Authority. *National Standards for the Prevention and Control of Healthcare Associated Infections*. Dublin: Health Information and Quality Authority; 2009. [Online]. Available from: <http://www.hiqa.ie/publication/national-standards-prevention-and-control-healthcare-associated-infections>.
- 2 Health Information and Quality Authority. *Guide: Monitoring Programme for unannounced inspections undertaken against the National Standards for the Prevention and Control of Healthcare Associated Infections*. Dublin: Health Information and Quality Authority; 2015. [Online]. Available from: <http://www.hiqa.ie/system/files/Guide-to-HCAI-Unannounced-Inspections-2015.pdf>
- 3 Health Protection Surveillance Centre. *Prevention of Intravascular Catheter - related Infection in Ireland*. Update of 2009 National Guidelines September 2014. 2014 [Online]. Available from: <http://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/IntravascularIVlines/Publications/File,14834,en.pdf>
- 4 Health Protection Surveillance Centre. *Guidelines for the prevention of catheter-associated urinary tract infection*. SARI Working Group. 2011. [Online]. Available from: <https://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Guidelines/File,12913,en.pdf>
- 5 Loveday H.P., Wilson J.A., Pratt R.J., Golsorkhi M., Tingle A., Bak A., Browne J. et al (2014) epic 3: National evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. *Journal of Hospital Infection*. 2014 January, Volume86, Supplement 1: ppS1-S70. [Online] Available from: <http://www.sciencedirect.com/science/article/pii/S0195670113600122>

[‡] All online references were accessed at the time of preparing this report.

6 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/.

7 St Michael's Hospital Quality Improvement Plan 2015. Available from: [http://www.stmichaels.ie/images/St Michaels Hospital Quality Improvement Plan following HIQA Inspection 2015.pdf](http://www.stmichaels.ie/images/St_Michaels_Hospital_Quality_Improvement_Plan_following_HIQA_Inspection_2015.pdf)

8 Health Service Executive. Cleaning Manual – Acute Hospitals [Online] Available from: [http://hse.ie/eng/services/publications/Hospitals/HSE National Cleaning Standards Manual.pdf](http://hse.ie/eng/services/publications/Hospitals/HSE_National_Cleaning_Standards_Manual.pdf)

9 The Regulation and Quality Improvement Authority Independent. Review of Incidents of Pseudomonas aeruginosa Infection in Neonatal Units in Northern Ireland. 2012 [Online]. Available from: http://www.rqia.org.uk/cms_resources/Pseudomonas%20Review%20Phase%20II%20Final%20Report.pdf

10 Health Protection Surveillance Centre. Guidelines for the Prevention and Control of Infection from Water Systems in Healthcare Facilities. 2015 [Online]. Available from: <https://www.hpsc.ie/AboutHPSC/ScientificCommittees/SubCommitteesofHPSCSAC/WaterGuidelinesSub-Committee/File,14451,en.pdf>

11 The British Standards Institution. PAS 5748:2014 *Specification for the planning, application, measurement and review of cleanliness services in hospitals*. 2nd edition. London: 2014.

12 European Union (Prevention of Sharps Injuries in the Healthcare Sector) Regulations 2014 (S.I. No. 135 of 2014) [Online]. Available from: [http://www.hsa.ie/eng/Legislation/New Legislation/S I 135 of 2014.pdf](http://www.hsa.ie/eng/Legislation/New_Legislation/S_I_135_of_2014.pdf)

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

14 Department of Health, United Kingdom. Health Building Note 00-10 Part C: Sanitary Assemblies. [Online]. Available from: http://www.dhsspsni.gov.uk/hbn_00-10_part_c_l.pdf.

15 Health Service Executive. HSELand. [Online]. Available from: <http://www.hseland.ie/tohm/default.asp?message=logout>.

16 The Health Protection Surveillance Centre. National Hand Hygiene Audit Results. [Online]. Available from: <http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/Handwashing/HandHygieneAudit/HandHygieneAuditResults/>.

17 HSE Hand Hygiene Observation Audit Standard Operating Procedure 2014 Version 3.0. [Online]. Available from: https://www.hpsc.ie/A-Z/Gastroenteric/Handwashing/HandHygieneAudit/HandHygieneAuditTools/File,12660_en.pdf

18 World Health Organization. *Guide to Hand Hygiene in Healthcare and WHO Hand Hygiene Technical Reference Manual*. [Online]. Available from: http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf?ua=1

19 Health Service Executive. Hand Hygiene Observation Audit Standard Operating Procedure April 2013. [Online]. Available from: http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/Handwashing/HandHygieneAudit/HandHygieneAuditTools/File,12660_en.pdf.

20 College of Physicians of Ireland and Health Service Executive. *Prevention of Intravascular Catheter-related Infection in Ireland Update of 2009 National Guidelines September 2014*. [Online]. Available from: <http://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/IntravascularIVlines/Publications/File,14834,en.pdf>

21 Health Service Executive. National Service Plan 2016. [Online]. Available from: <http://www.hse.ie/eng/services/publications/corporate/sp2015.pdf>

22 Joint Royal College of Surgeons in Ireland/Royal College of Physicians of Ireland Working Group on Prevention of Surgical Site Infection (2012) Preventing Surgical

Site Infections. Key Recommendations for Practice. [Online]. Available from:
http://www.rcpi.ie/content/docs/000001/775_5_media.pdf

Published by the Health Information and Quality Authority.

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

© Health Information and Quality Authority 2016