Bundle of documents for Oral hearings commencing from 19 August 2024 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 27

Miscellaneous Documents
Volume 6

SCOTTISH HOSPITALS INQUIRY

Table of Contents

1.	A38244908	24.8.2017 Ward 4b Ensuite HAI SCRIBE revised Ian Powrie/Alan Gallacher	Page 5
2.	A38759279	Infection control Issues meeting minutes dated 04 October 2017	Page 22
3.	A33662213	HAI Scribe dated June 2007	Page 29
4.	A44247015	678 QEUH_RHC 2018 Dec Water Contamination Summary of Incident and Findings	Page 64
5.	A47946602	NSS - Response to Request for Information of 4 March 2024 - Received 11 April 2024	Page 89
6.	A42362240	Report of Issues raised by Dr Teresa Inkster to Medical Director Dr Jennifer Armstrong - SCI process, infection control incidents and IMT Governance - by Dr Chris Deighan, Deputy Medical Director, NHS Greater Glasgow & Clyde - May 2021	Page 91
7.	A42361850	Appendix B	Page 102
8.	A49057430	Organisational chart	Page 104
9.	A46157936	Bacteraemia rates and Resistance Paediatric Haematoncology 2014-2018	Page 107
10.	A46157899	BJ notes re CW and IPC concerns	Page 130
11.	A46157920	IPC Weekly Report South Glasgow - 18 August 2017	Page 131
12.	A32454545	Patient-placement-sop-interim-v1-4march-20	Page 132
13.	A42253399	Duty of candour and communication during an infection control incident in a paediatric ward of a Scottish hospital: how can we do better? - Inkster T, [redacted] J Med Ethics 2022;48:160–164. doi:10.1136/medethics-2020-106862	Page 143

14.	A46157916	UKHSA Colindale Lab Report - Stenotrophomonas maltophilia - 19 April 2022	Page 148
15.	A46157860	NHSGGC Response To Questions Around Ward 6A, QEUH - 05 May 2023	Page 149
16.	A39465114	Att - Email chain from T Inkster to A Gallacher - RE: QEUH PICU Report & Option Appraisal - 13 August 2019 12:54	Page 158
17.	A39465128	Atts - Email from A Gallacher to K Clarkson et al - NHSGGC - Critical Ventilation Systems - 28 August 2019	Page 190
18.	A46157917	Email from C Peters to J Armstrong re Infection Control and the work on 4b for BMT - 23 August 2017	Page 227
19.	A46157922	Email from P McCamley on behalf of J Armstrong to C eters re Infection Control and the work on 4b for BMT - 03 September 2017	Page 229
20.	A46157923	Email from B Jones to C Peters re Neutropenics 4B - 30 August 2017	Page 232
21.	A46157863	Email from C Peters to L Shepherd and M Bain re Pseudomonas bacteremias - 30 December 2019	Page 235
22.	A46157867	Email from C Peters to T Inkster and others re Patient Placement - 15 January 2020	Page 237
23.	A46275521	Email from C Peters to P Wright re 2A RHC Advice required - 10 August 2015	Page 238
24.	A37852466	NHS NSS HPS Epidemiological Protocol for Case Note Review Report - Comments by Lesley Shepherd - Version 0.1 - February 2020 (former name: 'Protocol for case note review v01 (01)')	Page 243
25.	A35308861	NHS GGC Response to Case Note Review Overview Report - February 2021	Page 245
26.	A49695427	Appendix 2, Data & Systems Clarification	Page 294
27.	A49695429	Appendix 3, IMT Summary	Page 303
28.	A36591716	Appendix 4, Ward Safety data “Methodology SPCs and RCA”	Page 306

29.	A49763726	Public Health Commentary Case Review EC_comments from CNR team	Page 310
30.	A49763730	Response of PTT Team to Data Systems Clarification from NHS GGC	Page 311
31.	A49763728	Response from CNR team to NHS GGC IMT Summary	Page 314
32.	A43158824	4370 2018-09-13 2018-09-13 (17.46 Teresa Inkster) Fw drains	Page 317
33.	A47135237	Presentation to MB	Page 319
34.	A49073375	Notes on HIS report into the QEUH November 2022 for INWO - C Peters - 07 December 2022	Page 355

NHS National Services Scotland

SHFN 30:
HAI-SCRIBE

Questionsets and checklists

QEUH – Ward 4b
Ceiling & Ventilation Works

Health Facilities Scotland
Engineering and Environment

January 2015

Introduction

Scottish Health Facilities Note (SHFN) 30 in its 2014 published form comprises two parts:

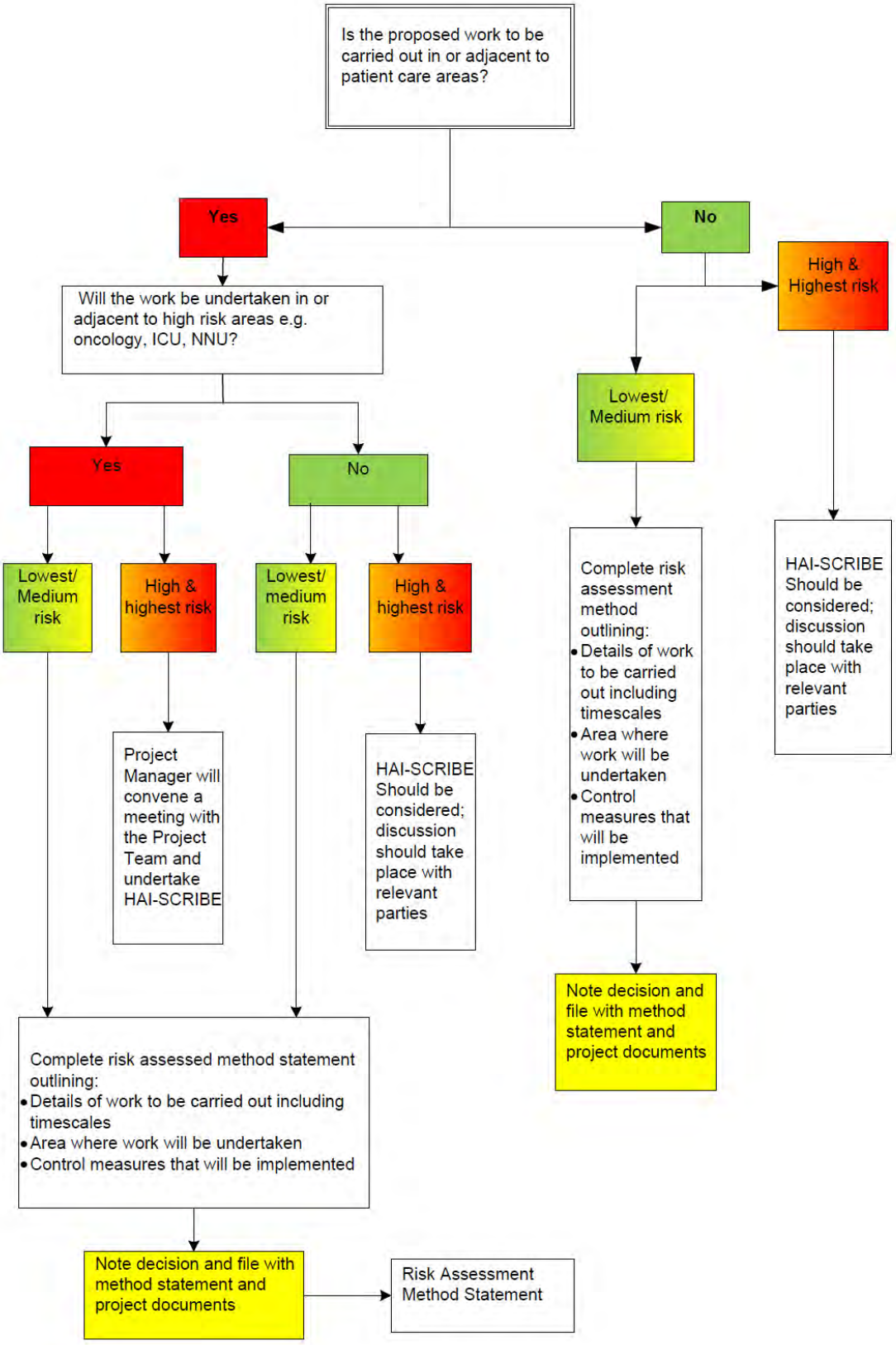
- **Part A**: Manual: Information for Design Teams, Construction Teams, Estates & Facilities and Infection Prevention & Control Teams.
- **Part B**: HAI-SCRIBE Implementation Strategy and Assessment Process.

Both have been published in book form.

It is appreciated that, as familiarity with the use of the procedures grows there will be progressively less need to rely on printed text, eventually leading to situations where Questionsets and checklists will themselves be sufficient. Photocopying from published books is a ponderous and time-consuming process with a tendency to produce distorted images and/or damage binding. To facilitate the process, therefore, Questionsets and checklists for each of the four project development stages have been produced in the form of an information pack ready for photocopying and distributing to project teams to assist in the HAI-SCRIBE review procedures as each new Project requires assessment. This pack is only available electronically.

The various proforma's, comprising Questionsets, checklists and certifications are provided for the following:

- **Development Stage 1:** Initial briefing and proposed site for development:
- **Development Stage 2:** Design and planning:
- **Development Stage 3:** Construction and refurbishment work:
- **Development Stage 4:** Pre-handover check, ongoing maintenance and feed-back.


Is the proposed work to be carried out in or adjacent to patient care areas?
Yes
No
Will the work be undertaken in or adjacent to high risk areas e.g. oncology, ICU, NNU?
High & Highest risk
Lowest/ Medium risk
Yes
No
Lowest/ Medium risk
High & highest risk
Lowest/ medium risk
High & highest risk
HAI-SCRIBE Should be considered; discussion should take place with relevant parties
Complete risk assessment method outlining:
• Details of work to be carried out including timescales
• Area where work will be undertaken
• Control measures that will be implemented
Project Manager will convene a meeting with the Project Team and undertake HAI-SCRIBE
HAI-SCRIBE Should be considered; discussion should take place with relevant parties
Note decision and file with method statement and project documents
Complete risk assessed method statement outlining:
• Details of work to be carried out including timescales
• Area where work will be undertaken
• Control measures that will be implemented
Note decision and file with method statement and project documents
Risk Assessment Method Statement

Type	Construction/Refurbishment Activity
Type 1	**Inspection and non-invasive activities.** Includes, but is not limited to, removal of ceiling tiles or access hatches for visual inspection, painting which does not include sanding, wall covering, electrical trim work, minor plumbing and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
Type 2	**Small scale, short duration activities which create minimal dust.** Includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting of walls or ceiling where dust migration can be controlled.
Type 3	**Any work which generates a moderate to high level of dust, aerosols and other contaminants or requires demolition or removal of any fixed building components or assemblies.** Includes, but is not limited to, sanding of walls for painting or wall covering, removal of floor coverings, ceiling tiles and casework, new wall construction, minor duct work or electrical work above ceilings, major cabling activities, and any activity which cannot be completed within a single work shift.
Type 4	**Major demolition and construction projects.** Includes, but it not limited to, activities which require consecutive work shifts, requires heavy demolition or removal of a complete cabling system, and new construction.

Table 1: Redevelopment and construction activity

Type 3

Risk to patients of infection from construction work in healthcare premises, by clinical areas	
Risk rating	**Area**
Group 1 Lowest risk	1. Office areas; 2. Unoccupied wards; 3. Public areas/Reception; 4. Custodial facilities; 5. Mental Health facilities.
Group 2 Medium risk	1. All other patient care areas (unless included in Group 3 or Group 4); 2. Outpatient clinics (unless in Group 3 or Group 4); 3. Admission or discharge units; 4. Community/GP facilities; 5. Social Care or Elderly facilities.
Group 3 High risk	1. A & E (Accident and Emergency); 2. Medical wards; 3. Surgical wards (including Day Surgery) and Surgical outpatients; 4. Obstetric wards and neonatal nurseries; 5. Paediatrics; 6. Acute and long-stay care of the elderly; 7. Patient investigation areas, including; • Cardiac catheterisation; • Invasive radiology; • Nuclear medicine; • Endoscopy. Also (indirect risk) 8. Pharmacy preparation areas; 9. Ultra clean room standard laboratories (risk of pseudo-outbreaks and unnecessary treatment); 10. Pharmacy Aseptic suites.
Group 4 Highest Risk	1. Any area caring for immuno-compromised patients*, including: • Transplant units and outpatient clinics for patients who have received bone marrow or solid organ transplants; • Oncology Units and outpatient clinics for patients with cancer; • Haematology units • Burns Units. 2. All Intensive Care Units; 3. All operating theatres; Also (indirect risk) 4. CSSUs (Central Sterile Supply Units).

Table 2: Different areas of health care facility and the risk associated with each area.

Group 4

	Construction Project Type			
Patient Risk Group	**TYPE 1**	**TYPE 2**	**TYPE 3**	**TYPE 4**
Lowest Risk	Class I	Class II	Class II	Class III/IV
Medium Risk	Class I	Class II	Class III	Class IV
High Risk	Class I	Class II	Class III/IV	Class IV
Highest Risk	Class II	Class III/IV	**Class III/IV**	Class IV

Table 3: Estimates the overall risk of infection arising and will indicate the class of precaution that should be implemented

Type 3 – Highest Risk

Control measures			
	During Construction Work	**After Construction Work**	**By**
Class I	• Execute work by methods to minimise raising dust from construction operations;. • Immediately replace any ceiling tiles displaced during inspection.	• Clean areas by damp dusting with neutral detergent in warm water;. • Vacuum floor and damp mop.	Request via domestic supervisor. Request via domestic supervisor.
Class II	• Provide active means to prevent airborne dust from dispersing into atmosphere; • Water mist work surfaces to control dust while cutting; • Seal unused doors with duct tape; • Block off and seal air vents; • Place dust mat at entrance and exit of work area; • Remove or isolate HVAC system in areas where work is being performed.	• Dampwork surfaces and ledges with neutral detergent solution; • Contain construction waste before transport in tightly covered containers; • Damp mop and/or vacuum with HEPA filtered vacuum before leaving work area; • Remove isolation of HVAC system in areas where work is being performed.	Request via domestic supervisor. Estates staff. Request via domestic supervisor. Estates staff.
Class III	• **Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system;** • **Complete all critical barriers eg plasterboard, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins;** • **Maintain negative air pressure within work site utilizing HEPA equipped air filtration units;** • **Contain construction waste before transport in tightly covered containers;** • **Cover transport receptacles or carts. Tape covering unless solid lid.**	• **Do not remove barriers from work area until completed project is inspected by the Board's Health & Safety representative and Infection Control Department and thoroughly cleaned by the Board's domestic services staff;.** • **Remove barrier materials carefully to minimise spreading of dirt and debris associated with construction;** • **Vacuum work area with HEPA filtered vacuums;** • **Damp mop area with neutral detergent and warm water;** • **Remove isolation of HVAC system in areas where work is being performed.**	**Request by Estates Dept.** **Contractor/Estates Staff.** **Request via domestic supervisor.** **Request via domestic supervisor.** **Contractor/Estates Staff.**

Table 4: Describes the required infection control precautions depending on class of risk

	During Construction Work	After Construction Work	By
Class IV	• Isolate HVAC system in area where work is being done to prevent contamination of duct system; • Complete all critical barriers eg plasterboard, plywood, plastic to seal area from non work area (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins; • Maintain negative air pressure within work site; • Seal holes, pipes, conduits, and punctures appropriately; • Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site; • All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area; Tack mats have to be used within containment area and at the entrance to the lift on the ground floor. A shoe dispenser should also be situated at the lift on the ground floor. • Do not remove barriers from work area until completed project is inspected. • Leave extractor running as a control measure to maintain negative pressure within work space and to maintain pressure from the lobby to the corridor.	• Remove barrier material carefully to minimise spreading of dirt and debris associated with construction; Builders Industrial clean also to be included in capital cost. • Contain construction waste before transport in tightly covered containers;. • Cover transport receptacles or carts. Tape covering unless solid lid; • Vacuum work area with HEPA filtered vacuums; • Damp dust area with neutral detergent and warm water; • Scrub floor area with neutral detergent in warm water; • Remove isolation of HVAC system in areas where work is being performed.	Contractor. Contractor. Contractor. Deep Clean by Contractor first then Request via domestic supervisor. Request via domestic supervisor. Contractor/Estates Staff.

Table 4 continued: Describes the required infection control precautions depending on class of risk

Construction and refurbishment Stage

Project particulars and checklists for Development Stage 3

Development stage 3: Construction and refurbishment work: Checklist to ensure all aspects have been addressed		
HAI-SCRIBE Name of Project	Ward 4B En-suite ceiling replacement (24 rooms)	
Name of Establishment	Queen Elizabeth University Hospital, Ward 4b	
National allocated number		
HAI-SCRIBE Review Team	As per attendance list	
HAI-SCRIBE Sign Off - As per attendance list		
Completed By (Project Manager) (Print Name) **Ian Powrie/Alan Gallacher**		Date: 24/8/2017
Signature		Date
Stage 3		

Additional Notes

Works will be carried out in 5 stages in 3 zones:

Stage 1: Screen off & seal with zipped air locks both sides, 2 separate locations, of the corridor to rear of ward 4b (isolating 10 rooms) including sealing off:

- Fire escape route, core “H” (break out in emergency escape requirements only).
- The equipment store
- Disabled WC

Stage 2: Screen off & seal with zipped air locks 2 individual single rooms Doors (How-015 & How-017) Facing nurses station (maintaining N\Station & support room access)

Stage 3: Screen off & seal with zipped air locks 2 individual single rooms Doors (How-011 & How-012) Facing nurses station (maintaining N\Station & support room access)

Stage 4: Screen off & seal with zipped air locks 1 individual single rooms Door (How-009) Facing nurses station (maintaining N\Station & support room access)

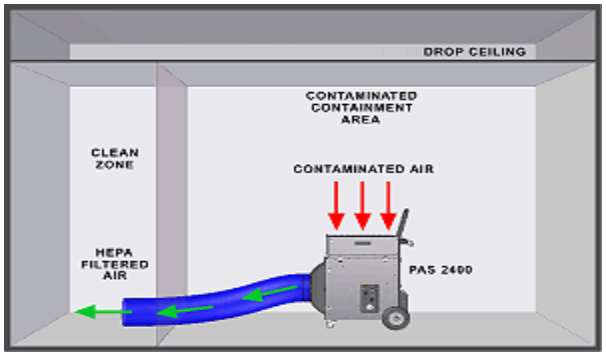
Stage 5: Screen off & seal with zipped air locks ~~3~~both sides of the corridor to rear of ward 4b (isolating 10 rooms) including sealing off:

Stage 6: Replace all Terminal HEPA Filters (24 off) on completion of construction works.

Notes:

- **See attached zone plan detailing staged works and environmental control containment locations**.
- **Isolation room door to corridor to be closed and sealed during works in each room.**
- **Deep clean within each zone before sealed Environmental Control Barriers are removed**.

Development stage 3: HAI-SCRIBE applied to Construction and refurbishment work Prior to the commencement of work		
3.1.1	Brief description of the work being carried out.	QEUH Ward 4b, BMT: Remove existing suspended ceiling grid and replace with a Solid Gyproc construction sealed system. This work will be carried out in 3 distinct zones as highlighted on attached layout drawing.
3.1.2	Using the matrix above establish the type and extent of construction and refurbishment /repair work, patients at risk and level of control measures.	
	Type of work - Type 3	
	Patient risk group - Group 4	
	Risk class - Class 3-4	
3.1.3	Identify any potential hazards associated with this work.	Dust Exposure
3.1.4	Identify any risk associated with the hazards identified above.	Fungal Infection
3.1.5	Outline the control measures that require to be implemented to eliminate or mitigate the identified risks. Ensure these are entered on the project risk register.	
	Control measures: All control measures detailed under risk class 3 are to be fully adopted with the exception of Isolation of the ventilation system which is covered in point 1, 2 & 3 of the additional control measures detailed below: <u>Zone 1 – Red Hatched Area. Work will be carried out in en-suite rooms numbered HOW-057,060,061,065,066,030,028,027,023,022&019.</u> General - Ventilation is common system to all ward isolation rooms therefore cannot be isolated, however the supplies are protected by Terminal HEPA filters which will protect the supply ductwork from dust; 1. Extract ducts will be sealed off to protect from dust contamination. 2. Mobile HEPA recirculation filtration units will be deployed in each room for the duration of the works in that space and over night on completion of the works. 3. A further HEPA recirculation filtration unit will be installed at North of ward (near room HOW-031) which will extract filtered air into the lobby CA4-030. The principle of which is shown below;	



4. Sealed work space:
    a. Zip Lock Environmental containment will be applied to zone.
    b. Internal door faces to be tape sealed during all works.
    c. See attached zone plan detailing staged works and environmental control containment locations.
5. Timber ceiling frames will be prefabricated off site.
6. Monitored work space
7. Good housekeeping
8. Protective Clothing
9. Tack mats at work space entry & exit.
10. A domestic water flushing programme will also be implemented during period of works in zone.
11. Increased domestic cleaning programme access route to ward and ward corridor. (2 times per day).
12. An industrial clean of the area will be carried out, followed by an internal domestic clean.
13. All HEPA filters located in the ductwork for this area will be replaced.
14. Validation of the ventilation system will be carried out to suit the requirements of SHTM03-01.

<u>PHASE 2 – Blue Hatched Area. Work will be carried out in en-suite rooms numbered HOW-018,014,012,010&008</u>

General - Ventilation is common system to all ward isolation rooms therefore cannot be isolated, however the supplies are protected by Terminal HEPA filters which will protect the supply ductwork from dust;

1. Extract ducts will be sealed off to protect from dust contamination.
2. Mobile HEPA recirculation filtration units will be deployed in each room for the duration of the works in that space and over night on completion of the works.
3. A void area will be created extending half the width of the corridor the full length of the Zone. A HEPA recirculation filtration unit will be installed in each room during the works which will extract filtered air into the nearest extract grill. The principle of which is shown above.
4. Sealed work space:
    a. Zip Lock Environmental containment will be applied to zone.
    b. Internal door faces to be tape sealed during all works.
    c. See attached zone plan detailing staged works and environmental control containment locations.
5. Timber ceiling frames will be prefabricated off site.
6. Monitored work space
7. Good housekeeping

	8. Protective Clothing 9. Tack mats at work space entry & exit. 10. A domestic water flushing programme will also be implemented during period of works in zone. 11. Increased domestic cleaning programme access route to ward and ward corridor. (2 times per day). 12. An industrial clean of the area will be carried out, followed by an internal domestic clean. 13. All HEPA filters located in the ductwork for this area will be replaced. 14. Validation of the ventilation system will be carried out to suit the requirements of SHTM03-01. <u>PHASE 3 – Green Hatched Area. Work will be carried out in en-suite rooms HOW-056,052,051,199,197,196,192&191.</u> General - Ventilation is common system to all ward isolation rooms therefore cannot be isolated, however the supplies are protected by Terminal HEPA filters which will protect the supply ductwork from dust; 1. Extract ducts will be sealed off to protect from dust contamination. 2. Mobile HEPA recirculation filtration units will be deployed in each room for the duration of the works in that space and over night on completion of the works. 3. A further HEPA recirculation filtration unit will be installed at North of this zone in corridor HOW-069_1 (near room HOW-055) which will extract filtered air into the lobby. If preferred this could go to the nearest extract.The principle of which is shown above. 4. The Clean Utility Room (HOW-039) will have a HEPA filter installed during this particular phase of works. 5. Sealed work space: a. Zip Lock Environmental containment will be applied to zone. b. Internal door faces to be tape sealed during all works. c. See attached zone plan detailing staged works and environmental control containment locations. 6. Timber ceiling frames will be prefabricated off site. 7. Monitored work space 8. Good housekeeping 9. Protective Clothing 10. Tack mats at work space entry & exit. 11. A domestic water flushing programme will also be implemented during period of works in zone. 12. Increased domestic cleaning programme access route to ward and ward corridor. (2 times per day). 13. An industrial clean of the area will be carried out, followed by an internal domestic clean. 14. All HEPA filters located in the ductwork for this area will be replaced. 15. Validation of the ventilation system will be carried out to suit the requirements of SHTM03-01.	
3.1.6	It has been recognised that control measures identified to address the project risk may have unintended consequences e.g. closure of windows can lead to increased temperatures in some areas. Such issues should be considered at this point, they should be noted and action to address these taken.	

	Potential problems • Failure of general ventilation in ward • Breach in work space containment
	Control measures: • Stop work immediately & escalate as per SOP. • Monitoring & escalation arrangements - SOP to be developed
3.1.7	**Actions to be addressed** **Action 1:** Preparation of Monitoring and escalation SOP (3.2.1, 2 ,4 & 3.3.3) **Action 2:** Definition and confirmation of access egress routes (3.2.3) **Action 3:** Terminal HEPA filters to be replaced on completion of works.(3.2.5) **Action 4:** Management programme for daily flushing regime to be put in place and recorded (3.2.6) **Action 5:** Routine ward cleans will be increased to 2 x daily for duration of works.(3.3.2)

By: **Action 1**:- Ian Powrie\ Lynn Prichard **Action 2**:- Ian Powrie\David Brattey\Lynn Prichard **Action 3:-**David Brattey **Action 4**:- David Brattey **Action 5:** Pat Coyne.	**Deadline:** **Action 1:**- Complete **Action 2:**- Complete **Action 3**:- **Date to be agreed after start date agreed.** **Action 4**:- **Date to be agreed after start date agreed.** **Action 5:- Date to be agreed after start date agreed.**

Development stage 3: In terms of infection risk confirmation that the following been addressed		
3.2.1	The population groups most susceptible to infection. Items to be considered: • Adjacent rooms, wards and departments • Relocation of susceptible patients Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments		
3.2.2	The hours of operation of the construction work and the impact of this on the clinical area. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments 8am-6pm 7 days per week. There is also the possibility to expedite this works by working at evenings.		
3.2.3	Separation of construction and healthcare activities including delivery and supply routes, removal of waste and patient transfers. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments Set of drawings to be produced for tender as per drawing 70520(57)01		
3.2.4	The construction of temporary barriers and/or sealing of doors and windows to minimise contamination of the environment by dust and potentially infectious particles created during the construction works. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments		

Development stage 3: In terms of infection risk confirmation that the following been addressed (continued)		
3.2.5	Airflow patterns including:	
	Internal and external ventilation systems	Yes ☑ No ☐ N/A ☐
	Exhaust ventilation	Yes ☑ No ☐ N/A ☐
	Sealing of doors and windows	Yes ☑ No ☐ N/A ☐
	Oxygen and Suction points	Yes ☑ No ☐ N/A ☐
	Air handlers, coils, fans and grilles	Yes ☑ No ☐ N/A ☐
	Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐
Comments Fully Re-validation and air permeability tests in compliance with SHTM 03-01 requirements		
3.2.6	Work with sinks or plumbing which could give rise to aerosol water droplets in high risk areas.	Yes ☐ No ☐ N/A ☑
	Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐
Comments Management programme for daily flushing regime to be put in place and recorded		
3.2.7	Impact on stock storage areas including:	
	Sterile and non-sterile items	Yes ☑ No ☐ N/A ☐
	Patient care equipment	Yes ☑ No ☐ N/A ☐
	Medications	Yes ☐ No ☐ N/A ☑
	Medical records and documentation	Yes ☐ No ☐ N/A ☑
	Linen and waste facilities including sharps	Yes ☐ No ☐ N/A ☑
	Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐
Comments Ward partially occupied, Environmental Containment control issues reviewed and agreed...		

Development stage 3: During the construction phase have the following been addressed?		
3.3.1	Where external work is being carried out: Prevention of insect and rodent entry and prevention of weather/water entry to internal areas during the construction phase. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☐ No ☐ N/A ☑ Yes ☐ No ☐ N/A ☑
Comments: **N\A**		
3.3.2	Cleaning of site and adjacent areas both during the construction phase and prior to handover. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐ Yes ☑ No ☐ N/A ☐
Comments Industrial deep clean to be completed by contractor at end of works. Routine ward corridor cleans will be increased to 2 x daily for duration of works.		
3.3.3	Enforcement of control and reporting system to ensure compliance with above issues. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐ Yes ☑ No ☐ N/A ☐
Comments Develop SOP and communication plan		
Additional notes - Stage 3		

Development stage 3: HAI-SCRIBE applied to the construction / redevelopment phase			
Certification that the following documents have been accessed and the contents discussed and addressed at the Infection Control and Patient Protection Meeting held on			
Venue	Laboratory Medicine, FRM Suite, Meeting room 5.	Date	24/8/2017
'Healthcare Associated Infection System for Controlling Risk in the Built Environment' *('HAI-SCRIBE) Implementation Strategy Scottish Health Facilities Note (SHFN) 30: Part B).*			
Declaration: We hereby certify that we have co-operated in the application of and where applicable to the aforesaid documentation.			
Present			

Print name	Signature	Company	Telephone Numbers	Email address
Teresa Inkster		Lead ICD	[redacted]	[redacted]
McColgan, Melanie		GM Regional Services	[redacted]	Melanie.McColgan[redacted]
Lynn Pritchard		Lead IPCN	[redacted]	Lynn.Pritchard[redacted]
David Brattey		Senior Estates Manager	[redacted]	David.brattey[redacted]

Minutes of Meeting
Meeting Room L02-001, Teaching & Learning Centre
Queen Elizabeth University Hospital

Wednesday 4th October 2017 at 8:00am

PRESENT

Dr Jennifer Armstrong (**Chair**)	JA	Medical Director
David Loudon	DL	Director of Property, Procurement & FM
Morag Gardner	MG	Chief Nurse
Sandra McNamee	SMcN	Associate Nurse Director IPC
Ian Powrie	IP	Depute General Manager, Estates
Professor Brian Jones	BJ	Head of Service, Microbiology
Tom Walsh	TW	Infection Control Manager
Anne Harkness	AH	Director, South Sector
Jonathan Best	JB	Acting Chief Operating Officer
Gary Jenkins	GJ	Acting Director, North Sector
Dr Penelope Redding	PR	Consultant Microbiologist
Dr Christine Peters	CP	Consultant Microbiology
[redacted]	[redacted]	[redacted]
Dr Rachel Green	RG	Chief of Medicine, Diagnostics

In Attendance

Ann Lang (Minutes) PA, Infection Prevention and Control

Item	Action

1. Welcome & Introductions

Dr Armstrong welcomed everyone to today's meeting to discuss Infection Control and estates issues at QEUH and RHC and round the table introductions were made. The group noted that colleagues from Women's and Children's Directorate were not in attendance but were aware of the issues raised and had helpfully submitted information via email which could inform the relevant areas of the discussion.

2. Purpose, Format and Conduct of Meeting

Dr Armstrong advised that a series of emails have been received from Dr Redding and Dr Peters regarding Infection Control and estates issues on the QEUH and RHC site. Dr Armstrong had requested a document setting out the issues of concern and thanked Drs Redding and Peters for providing the SBAR document which provided a helpful basis for the discussion. Dr Armstrong proposed that the meeting is focused on patient safety and a review and update on the current status of the issues identified.

She asked that if there are any comments during the meeting if these could be addressed through the chair and to adhere to the GMC and Board guidance regarding respect, professionalism and working as part of a team. The group agreed the importance of issues raised being discussed in the context of the appropriate roles, responsibilities and governance structures.

3. Review of SBAR / Concerns

It was agreed to go through the items detailed in the SBAR from Dr Redding and Dr Peters, to look at the points raised and address any outstanding issues.

Item	Action

- Patient Placement

Dr Redding outlined that there are challenges for the microbiologists regarding source isolation of infected patients.

She said the current situation is that the positive pressure ventilated lobby rooms were not built to SHTM standard and she and others were concerned that they do not provide appropriate protection when managing a small number of patients with significant respiratory pathogens of high consequence such as MERS and MDRTB.. Dr Peters advised that Microbiologists and ICDs and ID colleagues feel there is a lack of provision for isolation rooms in A&E. David Loudon replied that this specification was signed off by the board and clinical teams; he also confirmed that remedial work had been carried out due to issues raised at the snagging stage of the build. David also stated that although there were some modifications to the design the rooms did conform to SHTM 04-01 and that it was incorrect to state that this was not the case. Ian Powrie addressed specific points raised in respect of the ventilation specification and agreed to provide the detailed information to support this.

Sandra McNamee commented that the inclusion of the Infectious Diseases service was a late amendment to the QEUH project and therefore not commissioned as an ID unit at the outset. The group noted that the Brownlee Clinical Team put a strong clinical case to the board to be co-located on QEUH site with the Intensive Care Unit and other critical clinical services. The issues identified were discussed with HPS at the time and they agreed to advise the Board on what standard these rooms would need to be to accommodate these patients. When this information has been received, estates colleagues will review the advice to determine if these modifications were feasible. Dr Redding stated she would like to see the evidence relating to this. Sandra advised that a follow up meeting took place with HPS on Monday 2nd October and that the relevant information was expected in the next few weeks, however in the meantime a patient pathway has been in place which routes these patients to appropriate isolation rooms in other hospitals.

Dr Peters reported that these patients with significant airborne pathogens are being sent from A&E to the isolation rooms in ITU before being transferred to other hospitals as reported by ID colleagues. The group noted that this would be the case for other hospitals within NHSGGC and across NHS Scotland. Dr Peters however intimated that there is a risk of exposure to a large number of patients and staff and reiterated that, in her opinion, the ITU isolation rooms are not adequate for these types of patients. Furthermore other hospitals have not been recently built and are not a tertiary ID referral centre such as the QEUH. Dr Redding also recognised that work may be ongoing but the microbiologists are not aware of this.

Anne Harkness advised that as these issues were raised she met with Directors and ID Physicians and they agreed a pathway for these patients to be transferred to other sites. She also commented that based on the external advice, unless the existing rooms can be modified in some way the only alternative was to build a new Infectious Disease Unit which would require a significant resource. David Loudon confirmed that changing the specification to negative pressure would be reviewed to assess technical feasibility.

It was agreed to await the response from HPS and to deal with any further issues via the Acute and Board Infection Control Committees and the relevant Directorate Governance Committees.

Item	Action
• Protective Isolation Currently HEPA filters are not fitted in PICU isolation rooms and in the prep rooms in Ward 2A. Dr Redding also commented that IVs are prepared in the treatment room. She stated that there has been a perceived high rate of infections in immune compromised patients in Ward 2A and air quality has remained an issue in this ward since it opened. She also commented that there was an outbreak of Aspergillus in the unit and that there is still a risk to patients. Dr Peters said there was a public statement made by NHSGGC that BMT services at RHC are separate and unaffected and that both she and an ICD colleague had objected to the wording of the statement at the time and had asked to step down from ICD roles immediately after it was released. Dr Armstrong advised that she will check with the Comms team regarding the wording in the statement as this required some additional clarity around context. With regards to the cases of Aspergillus, Sandra McNamee updated that there were two cases in March and April associated with a leak in the ceiling space. This was investigated and the tiles were removed and replaced with no further cases of Aspergillus. Ian Powrie advised that the HEPA filters were installed in two of the rooms in adult ITU but there has been no request to add these to isolation rooms throughout the adult or children's hospital. Work in RHC, Ward 2A is scheduled to start this month and with the scribe being signed off he can now contact the contractors to start the work. Sandra McNamee confirmed that this was raised at a meeting she attended yesterday and that she was aware that there is a plan to put HEPA filters in two of the rooms in PICU as contingency. Ian Powrie said that the only reason this had not been done is that there was a requirement for the rooms to be unoccupied for 24 hours whilst this work was done and validation carried out and that up to this time it was not possible because the beds had been fully occupied and that there were ongoing discussions with the team in Ward 2A as to whether these patients could be accommodated in isolation rooms within other wards where HEPA Filters could be fitted to address the overspill contingency. Dr Peters commented that this was necessary in PICU, not just as an overspill for Ward 2A, but for these extremely vulnerable patients if they required intensive care treatment because of their illness. Dr Redding advised that the clinical team in Ward 2A have reported that in their experience there seemed to be an increase in the number of line related infections and Sandra advised that this was investigated by Infection Prevention Control and the clinical team when first raised and work had been ongoing for several months. She also reported that IPCT and the Clinical Team were working with Timothy Bradnock, Consultant Paediatric Surgeon to look at improvement work. Sandra noted that there was no effective benchmark available for this area. Dr Peters noted that rates of line infection were important to determine and that IPCT had stated there was no resource to do this. Jen Rodgers, Chief Nurse has an improvement group looking at PVC and CVC bundles and Sandra said that this should have an impact on the number of infections. Dr Armstrong added that there has been a focused piece of work carried out in Ward 2A and they were on a weekly reporting process to ensure compliance with infection control standards had improved. Dr Redding was concerned that this may not accurately pick up any concerns.	**JA**

Item	Action
In relation to the chemotherapy being prepared in the treatment rooms Gary Jenkins advised the group that chemo was prepared in a designated area and there was an audit process to confirm this. He also commented that this process had been reviewed recently and offered to provide Dr Redding the document that was produced. Dr Armstrong confirmed that chemo is not being made up in these rooms and is carried out in the Aseptic Dispensing unit. Dr Armstrong agreed to confirm this with Pharmacy.	**JA**
With regards to safe placement of immunocompromised patients, Dr Peters asked if there was a list of which rooms were of the standard that would be acceptable for this group of patients. She commented that when she worked in Crosshouse Hospital they had a list of where these particular patients could be placed. She said the microbiologists receive calls asking this question by clinical staff. The group debated the definition and severity of immunocompromised patients and agreed, with input from Sandra McNamee and Prof Jones that this was a decision best considered by the clinical team looking after the individual patients. Dr Armstrong advised that this should be discussed at AICC and Gary Jenkins commented that this has not been raised as an issue via his Regional Clinical Governance Committee. Dr Armstrong recommended that this be addressed through the Regional Clinical Governance Committee. She also said it would be helpful to have a copy of the document that Dr Peters used in Crosshouse. Dr Redding reiterated that Microbiologists need to know which rooms are the most suitable for different categories of patients.	**GJ** **CP**
Dr Redding commented that she feels the infection rates are not being monitored and Dr Armstrong replied that the Board and Acute Directors receive a weekly report of all outbreaks and infection control incidents. Dr Armstrong agreed to ask the Women & Children directorate to take forward the points raised above.	
• Single Side Room Accommodation Dr Redding outlined that air changes per hour for all clinical accommodation in QEUH and RHC are 3 instead of 6 as per guidelines with the inclusion of chilled beam technology. The grills also collect dust as air is entrained over chilled beams which she suggested is not recommended in a healthcare setting. Dr Peters advised this initially came to light when investigating issues regarding CF patients.	
David Loudon advised that Dumfries and Galloway have chilled beam technology and Dr Peters stated that Monklands Hospital is at the commissioning stage of a new build and suggested that we share our learning with them. It was agreed that it was important to share the GGC knowledge around chilled beam technology with colleagues in other Boards and David Loudon agreed to take this forward. Ian Powrie informed the group that all chilled beams on site are being cleaned and maintained and Dr Redding asked if the air changes can be changed from 3 to 6 in some rooms but not in all areas and David Loudon advised this was not realistically possible. Ian Powrie confirmed that cleaning and monitoring is being carried out to determine how quickly dust has built up and once this has been established a cleaning schedule will be organised and this can be shared with other hospitals. Dr Redding suggested involving Microbiologists regarding cleaning to look at the microbiological counts. Dr Jones suggested that rates of infection may also be a useful indicator. In this context Sandra McNamee reported that during the point prevalence survey QEUH was under the national average for infections and that all alert organism/conditions were monitored by the IPCT and that there were no indications that this site had a higher than average infection rates. It was noted that infections occurring post discharge would not be picked up by the point prevalence survey.	**DL**

Item	Action

- Cleaning

  In relation to cleaning Dr Redding stated that cleaning agents were not being used on floors in clinical areas.

  Dr Redding also outlined that dishwashers had not been cleaned, installed or operated according to manufacturing instructions. This was brought to light with the investigation into CF patients with Exophiala. Sandra McNamee updated regarding the occurrence of Exophiala in CF patients and said this was referred to HPS as an amber HIIAT score but they downgraded this to a green HIIAT as this is considered to be a ubiquitous organism and the modes of spread, incubation period and occurrence in the population and environment was largely unknown. Dr Peters stated that she had already discussed the outbreak in her role as CF Microbiologist with mycology experts and given the striking epidemiology of increasing numbers, it is a reasonable hypothesis to assume a link to the dishwashers as a possible source. She had also discussed the HIIAT rating with HPS and agreed with green rating as the intervention with dishwasher was rapidly and appropriately dealt with.

  With reference to the cleaning agents Sandra McNamee responded that Actichlor cleans are used throughout the winter norovirus season which normally runs from November to April. She also stated that Actichlor was used in specific areas at the recommendation of IPCT, for example. Actichlor was used in GGH for a month in the summer due to an increase in CDI across the site. This has also been introduced for general cleaning into the wards with CF patients in QEUH and RHC, PICU, NICU and Ward 2A. At a recent meeting with HPS Sandra said HPS have found no evidence that using Actichlor is effective but further guidance was awaited.

  With regards to dishwashers in the ward area there had been some debate in the ward regarding whose responsibility it was to clean these but Sandra said this has been addressed. The manufacturer has come in to check the dishwashers and Catering Services have confirmed they will commence a cleaning programme for the dishwashers. It was also noted that Environmental Health Officers prefer dishwashers to be used over hand washing in sinks/ basins.

  Dr Peters commented that the audit system did not pick up this problem, and raised concerns about gaps in the environmental audit programmes and this was possibly the same with regards to ward refrigerators or other equipment. Sandra McNamee advised that nursing staff have a requirement to check the temperature in fridges and stated again that the catering department have agreed to take responsibility for the ward dishwashers. The group noted that dishwasher maintenance had been overlooked in the overall system but that this had now been rectified.

- Water Quality and Testing

  In the SBAR it stated that all taps are fitted with TMVs and the cleaning and maintenance policy has not been reported and Dr Redding stated that we need to ensure this is up-to-date. She also commented that the water in Ward 4B has not been tested to a high standard.

  The group was assured that there was a Board Water Safety Policy in place that is approved by the appropriate governance committees. David Loudon reported that we have strict guidance on how to monitor water systems and processes are in place to comply with ECOPs. Ian Powrie also confirmed that water testing is carried out as per protocol and only exceptions are reported to the Infection Control Teams and this was previously agreed with Dr Inkster.

Item	Action

He said testing is mainly carried out in high risk areas. David Loudon stated that we are not required to test all taps but a sample and that this was in accordance with guidance. He also confirmed that if requested by an ICD additional sampling was undertaken. [redacted] said that Dr Inkster was managing the water testing and [redacted] perceived there was a problem with the environment. [redacted] said that [redacted] requested gram negative testing but did not receive the results from Estates. Ian Powrie replied that recent changes in staff in both estates and IPC could have been the reason why [redacted] did not receive the information. It was agreed that GGC are compliant with the water testing protocol. Dr Peters stated that the issue was not the overall testing protocols but the ICD role in requesting and receiving the results in a timely manner in exceptional circumstances where a water source of infection needed to be investigated.

In relation to TMVs Ian Powrie advised that these are maintained in all high risk areas and they are working towards carrying this out in all areas. He said the end piece of the taps cannot be removed and an SBAR is in place for this. Estates are finalising the installation of a heat sanitation system and once complete this will be sent to the Board Water Safety Committee for approval.

In terms of serratia Ian said they would test the water for this if requested by a clinician.

- Plumbing in Neuro Surgical Block
  Dr Redding stated that there has been sewage leaking in the theatre suite since before 2015 and is still ongoing and not all incidents have been reported to ICDs.

  Gary Jenkins advised that there is ongoing work in the neuro building that would, because of its complexity, take several years to complete. In the meantime the new operating theatres were due to open in January 2018. He stated that his directorate has a specific focus on IPC and that they had a dedicated group to look at surgical site infection. He said they funded 1.5 WTE surveillance nurses to carry out prospective surgical site surveillance in this area. Dr Armstrong updated that Dr Inkster carried out a detailed inspection of the area previously and she suggested that SSI surveillance was carried out here. Sandra McNamee advised for context that there are 3 surveillance nurses that cover all of GGC so the resource to actively do this in the INS was significant.

  She acknowledged that the ICDs were concerned about infections in EVD and stated that the clinical teams were currently developing an EVD bundle. Ian Powrie reported that remedial work was carried out in this building over the past year but that there had been an incident with sewage last week.

  There has been a delay in the opening of the ICE theatres as GGC were not satisfied with the standard but a programme of work has been agreed with the clinicians. Dr Peters said she requested to know the number of instances from when the theatres closed two years ago due to problems with the pipe work to date and she stated that she was told at the time of the initial problems that the plumbing was to be replaced. Gary Jenkins responded that that the pipes run through multiple floors and a process is in place with IPC and Capital Planning to take this forward in stages. Anne Harkness commented that increases in SSI should be discussed at the Regional Clinical IPC Group which [redacted] is a representative of. Ian Powrie advised that he has arranged to meet with [redacted] and Dr Balfour to discuss the INS theatre issue.

Item	Action

- Decontamination Provision for Respiratory Clinics
  The SBAR also stated that the decontamination facilities in both Paediatric and adult respiratory clinics have been identified as inadequate on a number of occasions. Sandra McNamee informed that remedial actions have been put in place and a list of items has been sent to HPS for advice on how to decontaminate them. Dr Peters stated that QEUH ICD had not been informed of timeline for revision works to decontamination area to take place.

- Infection Control Structure
  Dr Redding advised that the ICDs in the South Sector had stated that the roles within the Infection Control team are unclear and appear to have changed. Dr Armstrong proposed that consideration is given to having a further separate meeting to discuss the issues referred to in this section. Jonathan Best offered to support this discussion.

4. Agreement of Further Actions / Next Steps

- Ian Powrie to provide documents supporting work on PPVL rooms
- David Loudon to liaise with colleagues re GGC experience with chilled beams
- In relation to safe patient placement and availability of isolation rooms, this is to be raised via the Regional Clinical Governance Committee.
- Dr Peters to issue the group a copy of the document listing isolation rooms from Crosshouse Hospital.
- Dr Armstrong to relay issues pertaining to Ward 2A to Women & Children directorate.
- Dr Armstrong to confirm chemotherapy preparation in Aseptic Unit.
- Consideration to be given to a further meeting with a smaller group to discuss the issues contained in the Infection Control Structure section of the SBAR.
- Dr Armstrong to check with the Comms team regarding the wording in the public statement regarding BMT services

5. A.O.C.B.
Nil.

Dr Armstrong thanked everyone for their attendance today.

NHS National Services Scotland

HAI-SCRIBE (Healthcare Associated Infection System for Controlling Risk In the Built Environment)

Version 2

Health Facilities Scotland

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NHS National Services Scotland

HAI-SCRIBE

(Healthcare Associated Infection System for Controlling Risk In the Built Environment)

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Contents

page

1. Introduction 1

2. Development Stage 1: HAI-SCRIBE applied to the proposed site for development 4

3. Development Stage 2: HAI-SCRIBE applied to planning and design stage of development 7

4. Development Stage 3: HAI-SCRIBE applied to the construction/redevelopment phase 11

5. Development Stage 4: HAI-SCRIBE applied to the built healthcare facility in operation 19

Appendix 1: Examples of functions/services provided by a healthcare facility 27

References 30

Acknowledgements 31

1. Introduction

In recent years there has been an increase in concern about the risks to health from receiving treatment and care in healthcare facilities. The Report of a Joint Scottish Executive Health Department and NHSScotland Working Group (Carey Group 2001) states that studies have found:

- an estimated 9% of hospital patients acquire an infection during their stay;
- risks are not only present in hospitals but also in primary healthcare and social settings;
- there is a potential risk of vCJD, the human form of BSE, being spread from person to person by surgical instruments.

Furthermore, a Report by Walker (2001) states that the total cost in Scotland of HAI is approximately £186 million per annum.

Infection originating in hospitals and other healthcare facilities is now recognised as a serious and widespread problem. Although standards of hygiene in healthcare facilities and standards of personal hygiene have been identified as likely sources of infection and infection spread, it can also be said that the design, planning, construction, refurbishment and ongoing maintenance of the healthcare facility also have an important role to play in the control of infection.

Health Facilities Scotland has developed a system which aims to assess and manage the risk of infection in the built healthcare environment; this tool is called HAI-SCRIBE.

The acronym and title of HAI-SCRIBE describes the purpose of the system which is specifically designed to focus on the built environment and Healthcare Associated Infection (HAI) risk.

HAI-SCRIBE being the acronym for Healthcare Associated Infection System for Controlling Risk In the Built Environment, has been designed as an effective tool for the identification and assessment of potential hazards in the built environment and the management of these risks. HAI-SCRIBE, when applied to the built environment facilities of NHSScotland, is intended to be:

- appropriate to the subject;
- straightforward in its application;
- manageable and practical in terms of maintenance of monitoring records;
- comprehensive in its provision of ‘due diligence’ defence;
- effective in minimising hazards and their impact.

HAI-SCRIBE could be applied to other operational areas of NHSScotland. The built environment includes existing buildings used for healthcare purposes and

new build projects, and the intention is to apply HAI-SCRIBE from the design and planning through to the occupation and operation of the facility.

There are three key stages involved in HAI-SCRIBE:

- identify the hazard;
- assess the risk from the identified hazard;
- manage the risk to eliminate or minimise its impact.

The application of the three key stages of HAI-SCRIBE are aided by a range of questions which are appropriate for particular development stages of the healthcare facility. The scenarios within the development and maintenance of the healthcare facility to which the question sets apply are:

- proposed site for development;
- design and planning;
- construction and refurbishment;
- ongoing maintenance.

Care needs to be taken to ensure that the System does not become a mechanical 'box-ticking' exercise, but rather a rigorous questioning and auditing of proposals and of operating facilities.

In assessing the risk from the identified hazards, and in determining how to manage the risk to eliminate or minimise its impact, the nature of exposed population is a critical consideration.

Appendix 1 lists the healthcare and associated services commonly present in NHSScotland facilities.

In most cases there will be no option but to manage the risk to eliminate or minimise its impact. Health economics will inevitably be applied by the management of the healthcare facility in circumstances where there are a number of competing bids for resources and where those with an infection risk have a number of options suggested for the management of the risk. In such cases, the assessment of risk and the measures necessary to manage the risk must be evaluated carefully as part of the health economics decision-making. The recommendations of the HAI Task Force Working Group (12) and the HAI risk methodology developed by them may be helpful in prioritising risks.

Implementation of HAI-SCRIBE should be the responsibility of a multi-disciplinary team of specialists with appropriate skills, and may include:

- an architect;
- a building services engineer;
- an infection control specialist;
- a risk manager;

- an estates/facilities manager;
- other appropriate specialists.

This team should be representative of the appropriate specialists but small enough in number to ensure effective decision-making.

Implementation of HAI-SCRIBE requires an accurate record of the process of hazard assessment and risk management which is essential 'due diligence' information.

HAI-SCRIBE must be regularly reviewed, especially after alterations to the facility or to procedures within the facility. The frequency of review will be determined partly by the nature of the healthcare provision and particularly by any alterations to the facility or to procedures within the facility.

This process will require immediate review before, during, and after the proposed alterations. The nature of the healthcare provision may require a routine review once every 1 – 2 years, bearing in mind that the outcome of the review may be to confirm that the system is working well and that no adjustments are necessary. The review should be objective and undertaken by a competent person or persons either within or outwith the healthcare organisation.

A record of the initial application of HAI-SCRIBE and all subsequent applications and reviews must be kept and be available for reference. The records of the applications of HAI-SCRIBE and the regular reviews of the System should be reported to the responsible senior manager of the healthcare facility.

In circumstances where HAI-SCRIBE is being applied to the proposed site for development, design and planning, or the construction of a new build healthcare facility, the project board needs to be advised of the outcome. In cases where it is being applied to the refurbishment or operational management of an existing healthcare facility, the organisation's risk management group or formal group which addresses risk management should be advised of the outcome of the HAI-SCRIBE applications on an annual basis.

2. Development Stage 1: HAI-SCRIBE applied to the proposed site for development

The first application of HAI-SCRIBE in relation to the built environment will be at the initial planning stage when the appropriateness of the proposed site for the new build or extension, or indeed major refurbishment, is being considered.

There needs to be early confirmation that the main utility services are readily available, have sufficient capacity and are of satisfactory quality to cope with the proposed development.

In considering whether the site presents a potential HAI hazard, questions to be examined will include the following:

		Yes	No
2.1	Is contaminated land an issue? (e.g. smallpox – also refer to contaminated land register.)	☐	☐
2.2	Are there industries or other sources in the neighbourhood which may present a risk of noise, smell, other pollution or infection e.g. animal by-products processing plant?	☐	☐
2.3	Are there industries or other sources in the neighbourhood which may present a risk of noise, smell, or other pollution which might affect the designed operation of the healthcare facility e.g.windows and ventilation systems in the healthcare facility being kept closed because of a sewage treatment plant?	☐	☐

		Yes	No
2.4	Are there construction/demolition works programmed in the neighbourhood which may present a risk of noise, smell, other pollution or infection e.g. fungal infection?	☐	☐
2.5	Are there cooling towers in the neighbourhood which may present a risk of legionella infection?	☐	☐
2.6	Does the topography of the site in relation to the surrounding area and the prevailing wind direction present any potential HAI risk e.g. from entrainment of plumes containing legionella?	☐	☐
2.7	Is there a locally recognised increased risk of contamination/infection e.g. cryptosporidium?	☐	☐
2.8	Will the proposed development impact on the surrounding area in any way which may lead to restrictions being applied to the operation of the proposed facility which may in turn present potential for HAI risk e.g. storage and collection arrangements for healthcare clinical waste leading to pressure to reduce collection frequency?	☐	☐
2.9	Will lack of space limit the proposed development and any future expansion of the facility?	☐	☐

The above questions do not necessarily comprise an exhaustive list. Having established that main utility services are available, have sufficient capacity and are of satisfactory quality to cope with the proposed development, the next challenge is to establish which, if any, of the other questions evokes the answer 'yes'.

Where a potential hazard is identified a careful assessment of that hazard must be undertaken.

Some hazards may present a risk of pollution rather than direct infection but the consequences for the healthcare facility may be to keep windows and ventilation intakes closed, and this in turn may increase the risk of HAI in the healthcare facility. It may be necessary therefore to seek further information as part of the assessment of the hazard and this may include questions about:

- the seriousness of the dust, noise, smell and other pollution;
- the hours of operation;
- the volume of traffic;
- the kind of materials being handled and processed;
- the volumes of materials being handled and processed;
- the time/frequency of deliveries and traffic movement volume;
- the deliveries being in closed or open containers;

- the transfer arrangements from delivery vehicles to storage/processing facilities;
- the exhaust flues from the processing plant;
- the prevailing wind direction;
- the areas of the healthcare development most likely to be affected;
- the measures which could be designed into the proposed healthcare development to eliminate or minimise the impact of the pollution and if these measures might increase the risk of HAI.

Other existing industries in the area of the proposed healthcare facility development may present a more obvious and direct risk of bacterial or fungal infection e.g. any cooling towers posing a potential legionella risk, and/or any demolition or construction work posing a fungal infection risk. The assessment must take account of the source of the potential risk, its relationship to the healthcare facility and particular areas of the healthcare facility, the exposed population, and the measures which are available to the healthcare facility to reduce the impact of the infection risk. Consideration should also be given to infection risks at outpatient departments within the healthcare facility and access to the facility and outpatient departments.

3. Development Stage 2: HAI-SCRIBE applied to planning and design stage of development

The application of HAI-SCRIBE in the detailed planning and design of a new healthcare facility or a major redevelopment, refurbishment or extension of an existing healthcare facility is essential. It is at the planning and design stage that hazards associated with potential HAI risk should be identified and assessed and measures taken to manage the risks. It is sensible to 'design in' at the planning and design stage, measures which will eliminate or minimise the impact of identified hazards and effectively manage the risk of HAI.

HAI-SCRIBE, as applied to healthcare facility plans and designs, will involve a systematic and thorough review of the plans with a view to identifying potential hazards, assessing those hazards, and managing the risks by eliminating or minimising the impact of the hazards. This may well involve amendments to plans, bearing in mind that it is likely to be more cost effective to achieve the management of HAI risk at the planning stage rather than after completion of the facility construction.

Issues to be considered include the following:

- while the introduction of people to a healthcare facility immediately introduces challenges in terms of managing infection risk, the design and layout of the healthcare facility should not encourage the spread of infection;
- the design and layout of the healthcare facility should take account of the healthcare procedures and services to be provided and the appropriate management of risk required for the range of population groups (reference Development Stage 4).

Issues to be considered at the design and planning stage of the development will include an overall assessment of infection and infection spread risk from the

design and layout of the healthcare facility and an assessment of infection risk from detailed engineering and building features. Issues to be considered at this stage might include the following:

		Yes	No
3.1	Does the design and layout of the healthcare facility inhibit the spread of infection?	☐	☐
3.2	Is the ventilation system design fit for purpose, given the potential for infection spread via ventilation systems?	☐	☐
3.3	Has account been taken of the use of natural ventilation being affected by neighbourhood sources of environmental pollution as discussed in Development Stage 1?	☐	☐
3.4	Is the interior of the healthcare facility easy to clean and maintain clean? (Surfaces of floors, walls and ceilings should be appropriate to the particular room and the required management of infection risk. Thus, carpeted floors in offices may be appropriate but not appropriate in clinical areas. There should be coving at right angle junctions of walls, floors and ceilings to ease effective cleaning.)	☐	☐
3.5	Does each ward allow sufficient space between beds to comply with the current guidance, thus facilitating the healthcare services to the patient, which in turn may reduce HAI risk?	☐	☐
3.6	Are there facilities to enable high standards of hand hygiene to be maintained? For example, standards specified in: • 'Improving Clinical Care in Scotland Healthcare Associated Infection (HAI); Infection Control' (QIS 2003); • 'Standards Healthcare Associated Infection (HAI) Infection Control' (CSBS 2001). (Hand-wash basins, liquid soap dispensers, paper towels and alcohol gel dispensers must be provided in sufficient numbers and be readily accessible. It should be noted that the effective use of alcohol gel first requires hands to be physically clean.)	☐	☐
3.7	Where curtain rails and curtains are fitted are they easy to clean and maintain clean?	☐	☐
3.8	Is the toilet, bath and shower accommodation conveniently sited in relation to the ward and, where possible, is this accommodation en- suite?	☐	☐

		Yes	No
3.9	Is the toilet, bath and shower accommodation accessible for cleaning purposes and is the accommodation easily cleaned?	☐	☐
3.10	Does the ventilation of the toilet, bath and shower accommodation ensure extraction of air from the room to the outside air?	☐	☐
3.11	Are the staff changing facilities suitably sited, have sufficient space, and readily accessible?	☐	☐
3.12	Are the staff showering facilities suitably sited and readily accessible for use, particularly in the event of contamination incidents?	☐	☐
3.13	Is there satisfactory provision of isolation facilities for infectious and potentially infectious patients?	☐	☐
3.14	Is there separation of dirty areas from clean areas to minimise the risk of HAI contamination?	☐	☐
3.15	Is there sufficient storage accommodation provided in each area of the healthcare facility for equipment which is mobile and not in continuous use?	☐	☐
3.16	Are there satisfactory facilities for storage of cleaning equipment e.g. Domestic Services room?	☐	☐
3.17	Is the service ducting for utilities etc. concealed to ease routine cleaning of surfaces?	☐	☐
3.18	Does the service ducting for utilities provide sufficient access for maintenance and pest control?	☐	☐
3.19	Are there sufficient and conveniently sited facilities provided for the cleaning of common equipment like trolleys, wheelchairs etc?	☐	☐
3.20	Are the food preparation areas (including ward kitchens) and distribution systems fit for purpose and complying with current food safety and hygiene standards?	☐	☐
3.21	Are waste management facilities and systems robust and fit for purpose? (This includes local and central storage, systems for movement of waste to central storage, systems for handling and compaction of waste, systems for separation and security of waste, especially healthcare clinical waste.)	☐	☐

		Yes	No
3.22	Is the water distribution system designed to discourage bacterial growth and to ensure delivery of hot and cold water to users at the appropriate temperatures?	☐	☐
3.23	Is the drainage system design, especially within the healthcare facility building, fit for purpose with access points for maintenance carefully sited to minimise HAI risk?	☐	☐
3.24	Are there satisfactory arrangements for effective management of laundry? (This includes local and central storage, systems for movement of laundry to central storage, systems for handling laundry, systems for separation and security of laundry, especially contaminated laundry.)	☐	☐
3.25	Are there sufficient and suitably sited facilities for bed pan washing/disposal?	☐	☐

The answers to the above questions should be 'yes'. Where a potential hazard is identified a careful assessment of that hazard must be undertaken.

Reference should also be made to Development Stage 4 applied to the built healthcare facility in operation for more detail of the issues to be addressed in relation to:

- finishes and floors, walls, ceilings, doors, windows, fixtures and fittings;
- space around beds;
- isolation rooms;
- provision of hand-wash basins, liquid soap dispensers, paper towels and alcohol gel dispensers;
- provision of sinks for decontamination purposes;
- engineering services;
- storage;
- laundry and linen services.

4. Development Stage 3: HAI-SCRIBE applied to the construction/redevelopment phase

HAI-SCRIBE would be appropriate in redevelopment and refurbishment situations where the business of the healthcare facility continues while building and construction work is being undertaken on site. There are of course obligations on the contractors to undertake their construction operations in such a way that health and safety and other issues are adequately addressed.

Redevelopment and refurbishment of healthcare facilities in Scotland is common and the kind of work involved is varied. Kennedy (1997) described the range of redevelopment and refurbishment work commonly undertaken in healthcare facilities in the United States, and although some of the terminology may be different, her description of activities can be applied to redevelopment and refurbishment of healthcare facilities in Scotland.

In assessing the hazards of the above construction activities and the management of the potential risks, account has to be taken of the exposed population, in this case the patients, staff and visitors likely to be affected. Again, the risk assessment strategy described by Kennedy (1997) is useful.

Kennedy also highlighted a range of precautions needed to eliminate or manage the risk of infection.

In order to ensure the risk of infection is minimised during construction works consideration must be given to:

- the type of construction/refurbishment work being carried out (Table 1);
- the population group being treated (Table 2);
- the risk associated with these two factors (Table 3).

Table 1 highlights different types of construction/refurbishment activities likely to take place in the healthcare facility.

Table 2 highlights the different population groups within the healthcare facility and the risk associated with each group.

Table 3 estimates the overall risk of infection arising and indicates the level of precaution that should be implemented.

Type	Construction/Refurbishment Activity
Type 1	**Inspection and non-invasive activities.** Includes, but is not limited to, removal of ceiling tiles for visual inspection, painting which does not include sanding, wall covering, electrical trim work, minor plumbing and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
Type 2	**Small scale, short duration activities which create minimal dust.** Includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting of walls or ceiling where dust migration can be controlled.
Type 3	**Any work which generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies.** Includes, but is not limited to, sanding of walls for painting or wall covering, removal of floor coverings, ceiling tiles and casework, new wall construction, minor duct work or electrical work above ceilings, major cabling activities, and any activity which cannot be completed within a single work shift.
Type 4	**Major demolition and construction projects.** Includes, but it not limited to, activities which require consecutive work shifts, requires heavy demolition or removal of a complete cabling system, and new construction.

Table 1: Redevelopment and refurbishment construction activity. Adapted from Kennedy 1997.

Risk to patients of infection from construction work in healthcare premises, by clinical areas	
Group	**Area**
Group 1 Lowest risk	1. Office areas. 2. Unoccupied wards. 3. Public areas.
Group 2 Medium risk	1. All other patient care areas (unless included in Group 3 or Group 4). 2. Outpatient clinics (unless included in Group 3 or Group 4). 3. Admission or discharge units.
Group 3 High risk	1. A & E (Accident and Emergency). 2. Medical wards. 3. Surgical wards (including Day Surgery) and Surgical outpatients. 4. Obstetric wards and neonatal nurseries. 5. Paediatrics. 6. Acute and long stay care of the elderly. 7. Patient investigation areas, including: • Cardiac catheterization; • Invasive radiology; • Nuclear medicine; • Endoscopy. Also (indirect risk) 8. Pharmacy preparation areas. 9. Microbiology laboratories (risk of pseudo-outbreaks and unnecessary treatment).
Group 4 Highest Risk	1. Any area caring for immuno-compromised patients*, including: • Transplant units and outpatient clinics for patients who have received bone marrow or solid organ transplants; • Oncology Units and outpatient clinics for patients with cancer; • Burns Units. 2. All Intensive Care Units. 3. All operating theatres. Also (indirect risk) 4. CSSUs (Central Sterile Supply Units).

*__Immunocompromised patients__ are those patients whose immune mechanisms are deficient because of immunologic disorders (e.g. human immunodeficiency virus [HIV] infection or congenital immune deficiency syndrome), chronic diseases (e.g. diabetes, cancer, emphysema, or cardiac failure), or immunosuppressive therapy (e.g. radiation, cytoxic chemotherapy, anti-rejection medication, or steroids). Immunocompromised patients who are identified as high-risk patients have the greatest risk of infection caused by airborne or waterborne micro-organisms. Patients in this subset include persons who are severely neutropenic for prolonged periods of time (ie an absolute neutrophil count [ANC] of ≤ 500 cells/mL), allogeneic HSCT patients, and those who have received the most intensive chemotherapy (e.g. childhood acute myelogneous leukaemia patients).

Immunosuppresive conditions identified as risk factors for construction-related nosocomial fungal infections include graft-versus-host disease requiring treatment; prolonged neutropenia or granulocytopenia because of cytoxic chemotherapy; prolonged use of antibiotics; and steroid therapy. Other risk factors for the development of aspergillosis include dialysis and mechanical ventilation, smoking and patient age, the very young and very old being at greater risk Grauhan and colleagues reported that the risk of a fungal infection increases in patients who exhibit three or more risk factors ($p<0.001$). **CCDR (2001)**

Table 2: The different areas within the healthcare facility and the risk associated with each area.

	Construction Project Type			
Patient Risk Group	***TYPE 1***	***TYPE 2***	***TYPE 3***	***TYPE 4***
Low Risk	**Class I**	**Class II**	**Class II**	**Class III/IV**
Medium Risk	**Class I**	**Class II**	**Class III**	**Class IV**
High Risk	**Class I**	**Class II**	**Class III/IV**	**Class IV**
Highest Risk	**Class II**	**Class III/IV**	**Class III/IV**	**Class IV**

Table 3: Estimates the overall risk of infection arising and will indicate the class of precaution that should be implemented.

Having highlighted the overall degree of infection risk, appropriate infection control measures can be implemented to manage or eliminate the risk of transmission. Table 4 highlights the appropriate prevention and control of infection precautions.

	During construction of a project	*Upon completion of a Project*
Class I	1. Execute work by methods to minimise raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection.	Clean areas.
Class II	1. Provide active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Place dust mat at entrance and exit of work area. 6. Remove or isolate HVAC system in areas where work is being performed.	1. Wipe work surfaces with disinfectant. 2. Contain construction waste before transport in tightly covered containers. 3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 4. Remove isolation of HVAC system in areas where work is being performed.
Class III	1. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers ie plasterboard, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Contain construction waste before transport in tightly covered containers. 5. Cover transport receptacles or carts. Tape covering unless solid lid.	1. Do not remove barriers from work area until completed project is inspected by the Board's Safety Department and Infection Control Department and thoroughly cleaned by the Board's Environmental Services Department. 2. Remove barrier materials carefully to minimise spreading of dirt and debris associated with construction. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with disinfectant. 5. Remove isolation of HVAC system in areas where work is being performed.
Class IV	1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers ie plasterboard, plywood, plastic to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Seal holes, pipes, conduits, and punctures appropriately. 5. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site. 6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area. 7. Do not remove barriers from work area until completed project is inspected.	1. Remove barrier material carefully to minimise spreading of dirt and debris associated with construction. 2. Contain construction waste before transport in tightly covered containers. 3. Cover transport receptacles or carts. Tape covering unless solid lid. 4. Vacuum work area with HEPA filtered vacuums. 5. Wet mop area with detergent to remove physical soiling before disinfecting area. 6. Remove isolation of HVAC system in areas where work is being performed.

Table 4: Describes the required Infection Control Precautions depending on class of risk. Adapted from Kennedy 1997.

There are key issues to be considered in assessing the hazard with a view to managing the risk. Therefore, in each situation where there is to be construction and refurbishment or repair work, the multi-disciplinary team of specialists referred to in the 'Introduction' of this document should be involved and the following questions need to be addressed.

Consideration should be given to the likelihood of patient movement outwith their speciality care area and the need for appropriate measures to control infection risk.

		Yes	No
4.1	Has the type and extent of construction and refurbishment or repair work been addressed in terms of infection risk?	☐	☐
4.2	Has the likelihood of contaminating adjacent patient care areas, and those on levels immediately below and above been addressed?	☐	☐
4.3	Has the impact on traffic and supply routes been addressed in terms of infection risk?	☐	☐
4.4	Has the impact on sterile stock storage areas been addressed?	☐	☐
4.5	Has the impact of airflow patterns and ventilation systems been addressed in terms of infection risk from construction and refurbishment or repair work?	☐	☐
4.6	Has the extent of the dust, noise and infection risk from the construction and refurbishment or repair work been addressed?	☐	☐
4.7	Have the hours of operation of the construction work and the impact of this in terms of infection risk been addressed?	☐	☐
4.8	Have the areas of the healthcare facility most likely to be affected by the dust, noise and infection risk been identified and the infection risks addressed?	☐	☐
4.9	Have the population groups most susceptible to infection been identified and the risks associated with noise, dust, and infection been addressed?	☐	☐
4.10	Has the particular risk of fungal infection from demolition and refurbishment construction been identified and measures put in place for the infection risk to be managed effectively to minimise impact on patients and visitors?	☐	☐
4.11	Have measures been designed in to eliminate or minimise the impact of the dust, noise and infection risk?	☐	☐

The answers to the above questions should be 'yes'. Where a potential hazard is identified a careful assessment of that hazard must be undertaken.

Certain situations will require the use of barrier structures to contain contamination. Therefore the following questions need to be addressed for each of these situations:

		Yes	No
4.12	Has the use of barrier structures to contain contamination been addressed in the following situations? -	☐	☐
4.13	Demolition of walls, plaster, ceramic tiles, ceilings and ceiling tiles?	☐	☐
4.14	Removal of flooring and carpeting, windows and doors?	☐	☐
4.15	Work with sinks or plumbing which could give rise to aerosol water droplets in high risk areas?	☐	☐
4.16	Exposure of ceiling spaces?	☐	☐
4.17	Elevator shaft demolition and construction?	☐	☐
4.18	Repairs to water damage?	☐	☐
4.19	Has the type and extent of construction and refurbishment or repair work been addressed in terms of infection risk?	☐	☐

The answers to the above questions should be 'yes'. Where a potential hazard is identified a careful assessment of that hazard must be undertaken.

Measures to minimise risk of infection should be addressed. Therefore the following question needs to be addressed.

		Yes	No
4.20	Have measures to minimise risk of infection been investigated, including the following? -	☐	☐
4.21	Relocation of susceptible patients?	☐	☐
4.22	Prevention of weather/water entry and protection of interior?	☐	☐
4.23	Prevention of contamination by dust etc. with particular attention to air systems e.g. ducts, air handlers, coils, fans, grills by creation of temporary barrier structures or exhaust ventilation to isolate work areas?	☐	☐

		Yes	No
4.24	Has the discharge of exhaust air been arranged so as not to re-enter the building e.g. via outside air intakes, nor cause pollution to other areas?	☐	☐
4.25	Maintenance of all internal building areas in a clean state?	☐	☐
4.26	Sealing of all external walls, windows, doors, etc. prior to commencement of construction work?	☐	☐
4.27	Prevention of insect and rodent entry to area during construction phase?	☐	☐
4.28	Separation of construction work traffic and healthcare traffic during construction phase?	☐	☐
4.29	Thorough cleaning of area on completion of construction work, including surfaces, under floor and ducts? (Further guidance on cleaning can be found in the NHSScotland National Cleaning Services Specification produced by the HAI Task Force)	☐	☐
4.30	Enforcement of control and reporting system to ensure compliance with above issues?	☐	☐

The answers to the above questions should be 'yes'. Where a potential hazard is identified, a careful assessment of that hazard must be undertaken.

5. Development Stage 4: HAI-SCRIBE applied to the built healthcare facility in operation

Within the built healthcare facility it is important to ensure there will be an ongoing application of HAI-SCRIBE. This is of particular importance where there are alterations to the building, to arrangements within the building, and to procedures and practices. The three key stages involved in HAI-SCRIBE have a continuous application:

1. Identify the hazard.
2. Assess the risk from the identified hazard.
3. Manage the risk to eliminate or minimise impact.

Healthcare managers are familiar with audits of performance and the concept of 'due diligence'. Programmed audits of the healthcare facility are an essential part of 'due diligence' and records of these audits should be maintained. This will already be in place in relation to a number of activities within the healthcare facility e.g. food hygiene. The audits will monitor the ongoing application of HAI-SCRIBE, bearing in mind that the system must not become a mechanical, box-ticking exercise, but rather a rigorous questioning and auditing of the operating healthcare facility.

A record of the initial application of HAI-SCRIBE and all subsequent applications and reviews must be kept and be available for reference. The records of the applications of HAI-SCRIBE and the regular reviews of the system should be reported to the appropriate management group of the healthcare facility. This may be the organisation's risk management group or formal group which addresses risk management and they should be advised on an annual basis.

Issues for audit purposes will include the following.

The neighbourhood environment

In considering whether there are industrial and commercial developments in the neighbourhood which may present a risk of noise, smell, other pollution or infection, reference should be made to Development Stage 1.

Neighbourhoods change with new or extended industries and commercial operations being developed. The managers of the healthcare facility need to be alert to developments in the neighbourhood which may present an HAI risk.

The healthcare facility

Finishes and floors, walls, ceilings, doors, windows, fixtures and fittings

		Yes	No
5.1	Is the flooring, impervious and easily cleaned? (With the aid of specialist equipment as appropriate.) (Carpeting is not appropriate in any clinical or associated area.)	☐	☐
5.2	Are the walls smooth, impervious and easily cleaned?	☐	☐
5.3	Are the ceilings smooth and easily cleaned?		
5.4	Are the right angle junctions between floors, walls and ceilings coved to ease cleaning?	☐	☐
5.5	Are surfaces of floors, walls and ceilings maintained in good condition to enable effective cleaning?	☐	☐
5.6	Are surface joints, which should be kept to a minimum, effectively sealed?	☐	☐
5.7	Is the use of window blinds and the material they are made from been carefully considered, remembering the need to maintain the blinds in a clean condition?	☐	☐
5.8	Are all surfaces, fittings, fixtures and furnishings designed for easy cleaning and to enable them to be maintained in a clean condition?	☐	☐
5.9	Are soft furnishings covered in an impervious material in all clinical and associated areas, and are curtains able to withstand washing at disinfection temperatures?	☐	☐

Space around beds and isolation rooms

		Yes	No
5.10	Is the space around beds in accordance with current NHSScotland guidance?	☐	☐
5.11	Are there sufficient single rooms to accommodate patients known to be an infection or potential infection risk?	☐	☐
5.12	Is the bathroom/shower/toilet accommodation sufficient and conveniently accessible, with toilet facilities no more than 12m from the bed area?	☐	☐
5.13	Is the bathroom/shower/toilet accommodation easily cleaned?	☐	☐
5.14	Are there sufficient en-suite single rooms with negative/positive pressure ventilation to minimise risk of infection spread from particular patients?	☐	☐

Provision of hand-wash basins, liquid soap dispensers, paper towels and alcohol gel dispensers

It should be noted in all references to provision of hand-wash basins, liquid soap dispensers, paper towels and alcohol gel dispensers that the effective use of alcohol gel first requires hands to be physically clean.

It should also be noted that alcohol gel dispensers may be secured to the wall, however, they may also be secured to the trolley or to staff belts.

		Yes	No
5.15	Does each single room have a hand-wash basin, liquid soap dispenser, paper towels, and alcohol gel dispenser over and above the hand-wash basin in the en-suite facility?	☐	☐
5.16	Do intensive care and high dependency units have sufficient hand-wash basins, liquid soap dispensers, paper towels, and alcohol gel dispensers conveniently accessible to ensure the practice of good hand hygiene? (Good practice suggests one hand-wash facility per bed space.)	☐	☐
5.17	Is there provision of hand-wash basins, liquid soap dispensers, paper towels, and alcohol gel dispensers in lower dependency settings like mental health units, acute, elderly and long term care settings appropriate to the situation with a ratio of 1 basin/dispenser to 4–6 beds?	☐	☐
5.18	Do out-patient areas and primary care settings have a hand-wash basin close to where clinical procedures are carried out?	☐	☐

		Yes	No
5.19	Do all toilets have a hand-wash basin, liquid soap dispenser, paper towels, and alcohol gel dispenser?	☐	☐
5.20	Are all hand-wash basins used exclusively for hand hygiene purposes?	☐	☐
5.21	Does each hand-wash basin have wall mounted liquid soap dispenser, paper towel dispenser and alcohol gel dispenser?	☐	☐
5.22	Does each hand-wash basin satisfy the requirement not to be fitted with a plug?	☐	☐
5.23	Are elbow-operated or other non-touch mixer taps provided in clinical areas?	☐	☐
5.24	Does each hand-wash basin have a waterproof splashback surface?	☐	☐
5.25	Is each hand-wash basin provided with an appropriate waste bin for used hand towels?	☐	☐

Provision of facilities for decontamination

		Yes	No
5.26	Are separate, appropriately sized sinks provided locally, where required, for decontamination? (The sinks should be large enough to immerse the largest piece of equipment and there should be twin sinks, one for washing and one for rinsing. A hand-wash basin should be provided close to the twin sinks.)	☐	☐
5.27	Are appropriate decontamination facilities provided centrally for sterilization of specialist equipment?	☐	☐
5.28	Is there adequate provision in terms of transport, storage, etc. to ensure separation of clean and used equipment and to prevent any risk of contamination of cleaned equipment?	☐	☐
5.29	Does the system in operation comply with the current guidance on decontamination facilities and procedures?	☐	☐

Engineering services

		Yes	No
5.30	Are heat emitters, including low surface temperature radiators, designed, installed and maintained in a manner that prevents build up of dust and contaminants and are they easy to clean?	☐	☐
5.31	Is the ventilation system designed specifically for use within a healthcare facility.	☐	☐
5.32	Is the ventilation system designed so that it does not contribute to the spread of infection within the healthcare facility. (Ventilation should dilute airborne contamination by removing contaminated air from the room or immediate patient vicinity and replacing it with clean air from the outside or from low-risk areas within the healthcare facility. Ventilation systems should be in accordance with SHTM 2025: 'Ventilation in Healthcare Premises'.)	☐	☐
5.33	Does the ventilation system design ensure that components of the system do not introduce contaminates into the air stream e.g. cooling coils, humidification systems?	☐	☐
5.34	Are the ventilation system components e.g. air handling, ventilation ductwork designed to allow them to be easily cleaned?	☐	☐
5.35	Does the ventilation design exclude certain humidification systems e.g. water spray humidifiers?	☐	☐
5.36	Does the ventilation design recognise that a steam humidification system is preferred with the system designed and controlled so as not to cause long lasting surface wetness?	☐	☐
5.37	Are the grilles designed to allow easy maintenance and cleaning?	☐	☐
5.38	Is the positioning of extract vents clear of inlet vents to prevent risk of contamination?	☐	☐
5.39	Does the design and operation of re-circulation of air systems take account of dilution of contaminates and the space to be served?	☐	☐
5.40	Is the ventilation of theatres and isolation rooms in accordance with current guidance (SHTM 2025 and the Scottish Hospital Infection Manual)?	☐	☐
5.41	Does the ventilation of areas where re-circulation or spread of pathogens is a risk (including all clinical areas) ensure full fresh air recovery and air change rates in accordance with current guidance (SHTM 2025)?	☐	☐

		Yes	No
5.42	Is mechanical ventilation preferred to natural ventilation?	☐	☐
5.43	Does means of control of pathogens consider whether dilution or entrainment is the more appropriate for particular situations?	☐	☐
5.44	Does the positioning of air intakes and air outlets take into account the need to minimise risk of contamination?	☐	☐
5.45	In situations where ventilation systems are used for removal of pathogens, does the design and operation of the system take account of infection risk associated with maintenance of the system?	☐	☐
5.46	Are specialist ventilation systems such as fume cupboards installed and maintained in accordance with manufacturer instructions?	☐	☐
5.47	Is the lighting designed so that lamps can be easily cleaned with minimal opportunity for dust to collect?	☐	☐
5.48	Are vacuum-controlled units with overflow protection devices for mechanical suction used to avoid contaminating the system with aspirated body fluid?	☐	☐
5.49	Are water systems designed, installed and maintained in accordance with current guidance (SHTM 2040: 'The control of legionaella in healthcare premises – A code of practice' and SHTM 2027: 'Hot and cold water supplies, storage and mains services'.)	☐	☐
5.50	Is contamination of the water supply prevented by good design of pipework, appropriate storage, and care during refurbishment work?	☐	☐

In particular:

5.51	Is the water supply system designed to allow programmed cleaning of the water storage tanks?	☐	☐
5.52	Is the water supply system designed to ensure maintenance of a high temperature in hot water supplies or for the introduction of a form of on-line disinfection if lower temperature hot water is used to avoid thermostatic mixing valves and scalding (in line with Health and Safety Executive guidance)?	☐	☐
5.53	Is the water supply system designed to ensure regular maintenance of plant and the minimising of dead-legs?	☐	☐
5.54	Is the water supply system designed to ensure cold water systems are maintained at the appropriate temperature?	☐	☐

		Yes	No
5.55	Is the water supply system designed to minimise water storage (in line with NHSScotland guidance)?	☐	☐
5.56	Is the water supply system designed to ensure protection of immuno-compromised patients (e.g. dialysis patients and their Reverse Osmosis supply), who are at risk from certain organisms found in water supplies?	☐	☐
5.57	Is the water supply system designed to allow the making of ice for the immuno-compromised by putting drinking water into single-use icemakers and then into a conventional freezer?	☐	☐
5.58	Is the water distribution system designed to discourage bacterial growth?	☐	☐
5.59	Are facilities available to enable special interventions for legionella such as chlorination/chlorine dioxide, copper/silver ionisation treatment of water?	☐	☐
5.60	Is the drainage system design, especially within the healthcare facility building, fit for purpose with access points for maintenance carefully sited to minimise HAI risk?	☐	☐
5.61	Are surface mounted services avoided and services concealed with sufficient access points appropriately sited to ease maintenance and cleaning? (These services would include water, drainage, heating, medical gas, wiring, alarm system, telecoms, equipment such as light fittings, bedhead services, heat emitters.)	☐	☐
5.62	Is the concealed service ducting designed, installed and maintained to minimise risk of pest infestation?	☐	☐
5.63	Does the design and build of the facility allow programmed maintenance of the fabric to ensure the integrity of the structure and particularly the prevention of water ingress and leaks and prevention of pigeon and other bird access?	☐	☐

Storage

5.64	Is there suitable and sufficient storage provided in each area of the healthcare facility for patients' clothes and possessions, domestic cleaning equipment and laundry, large pieces of equipment like beds, mattresses, hoists, wheelchairs, trolleys, and other equipment including medical devices, wound care, and intravenous infusion equipment?	☐	☐
5.65	Is there separate, suitable storage for contaminated material and clean material to prevent risk of contamination?	☐	☐

Laundry and linen services

		Yes	No
5.66	Do the laundering facilities have the capacity to cope with the throughput of the healthcare facility?	☐	☐
5.67	Is there provision for strict separation of dirty and clean linen to minimise risk of contamination, with a dirty to clean workflow and sufficient and separate storage capacity?	☐	☐
5.68	Is there provision for appropriate colour-coded bagging of laundry into categories (i.e. used, heat labile and infectious) to minimise risk of contamination?	☐	☐
5.69	Is the on-site laundry of suitable construction and design to minimise risk of contamination and is the laundry equipment fit-for-purpose?	☐	☐
5.70	Is the laundry provided with suitable, sufficient and appropriately sited hand-wash basins, liquid soap dispenser, and paper towels?	☐	☐

The answers to all the above questions should be 'yes'. Where a potential hazard is identified, a careful assessment of that hazard must be undertaken. Health economics is about prioritising competing demands on finite resources, and its application to infection risk must take account of cost in terms of finance and perhaps more importantly in terms of human illness and death.

Appendix 1: Examples of functions/services provided by a healthcare facility

Expanded from Scottish Healthcare Costs 2002/2003

http://www.isdscotland.org/isd/files/costs_2003.pdf

Clinical

Accident and emergency
Adolescent psychiatry
Anaesthetics
Blood transfusion
Breast screening service
Cardiac surgery
Cardiology
Cardiothoracic surgery
Child and adolescent
Child psychiatry
Chiropody
Clinical chemistry
Clinical genetics
Clinical oncology
Clinical pharmacology and therapeutics
Communicable diseases
Community child health
Community dental practice
Community psychiatry
Dental public health
Dermatology
Diabetes
Diagnostic radiology
Ear nose and throat
Endocrinology and diabetes
Endocrinology
Family planning service
Forensic psychiatry
GP obstetrics
GP other than obstetrics
Gastroenterology
General dental practice
General medicine
General practice
General psychiatry (mental illness)
General surgery
Genito-urinary medicine
Geriatric medicine
Gynaecology
Haematology
Homeopathy
Immunology
Learning disabilities
Medical oncology
Medical paediatrics
Microbiology
Midwifery
Nephrology
Neurology
Neurosurgery
Nuclear medicine
Obstetrics and gynaecology
Obstetrics ante-natal
Obstetrics post-natal
Obstetrics
Occupational health
Ophthalmology
Oral medicine
Oral surgery
Orthodontics
Orthopaedics
Paediatric dentistry
Palliative medicine
Pathology
Plastic surgery
Psychiatry of old age
Psychotherapy
Public health medicine
Rehabilitation medicine
Respiratory medicine
Restorative dentistry
Rheumatology
Surgical paediatrics
Surgical podiatry
Thoracic surgery
Urology
Vascular surgery
Virology
Well woman service

Non clinical

Administration
Car parking
Catering
Conference support
Education
Human resources
Laundry services
Patient transport
Power generation and distribution
Residences
Retail
University
Waste disposal services
Work and plant
Circulation

Acute

Cardio thoracic group
- Cardio thoracic surgery
- Cardiac surgery
- Thoracic surgery

Communicable diseases group
- Communicable diseases
- Infectious diseases

Dental group
- Orthodontics
- Paediatric dentistry
- Restorative dentistry

ENT
- Ear nose and throat
- Otolaryngology

Surgery group
- General surgery
- Vascular surgery
- Maxillo-facial surgery

Medical group
- General medicine
- Cardiology
- Endocrinology
- Gastroenterology
- Genito-urinary medicine
- Uro-pelvic medicine
- Homeopathy
- Medical oncology
- Clinical pharmacy therapeutics
- Nuclear medicine
- Palliative medicine

Oral group
- Oral surgery
- Oral medicine

Accident and emergency
Coronary care unit
Dermatology
Gynaecology
Haematology
Intensive care unit
Medical paediatrics
Nephrology
Neurology
Neurosurgery
Ophthamology
Orthopaedics
Plastic surgery
Radiotherapy
Rehabilitation medicine
Respiratory medicine
Rheumatology
Spinal paralysis
Surgical paediatrics
Urology

Maternity
- Obstetrics specialist group
- Obstetrics ante natal
- Obstetrics post natal
- Obstetrics
- Midwifery
- Obstetrics GP
- Special care baby unit

Psychiatry
- Forensic psychiatry
- General psychiatry
- Psychotherapy
- Child psychiatry
- Adolescent psychiatry
- Psychiatry of old age

Community Care
- Community psychiatric nursing
- Community midwifery
- Health visiting
- General practice
- General dental practice
- Community OT
- Pharmacy
- Optician
- Community chiropody

Other clinical services
- Decontamination
- Laboratory
- Mortuary
- Operating theatres
- Pathology
- Clinical pharmacy
- Radiology
- X-ray

Acute (continued)

Primary care
- Mental health group
- Adult mental health
- Continuing mental health
- Elderly mental care
- Learning disabilities

Intensive psychiatric care group
- Addiction in primary care
- Assessment in primary care
- Rehabilitation in primary care

Elderly mental health
Young chronic disabled
Mental health day hospital
Palliative care
Resource centre
Minor injuries unit
Occupational physio and speech therapy
Learning disabilities
Geriatric assessment
Geriatric continuing care
Young physically disabled

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Health Protection Scotland

NHS National Services Scotland

Summary of Incident and Findings of the NHS Greater Glasgow and Clyde: Queen Elizabeth University Hospital/Royal Hospital for Children water contamination incident and recommendations for NHSScotland

Date: 20/12/18

Status: Final v2

Contents

Executive summary 3
Background 4
Summary of clinical cases associated with this incident 7
Summary of initial findings 9
Current management of situation/Control measures 12
Hypothesis 14
Summary 17
Recommendations 18
Appendix : 1 Timeline of cases 20
References 21
Glossary 23

Executive summary

NHS Greater Glasgow and Clyde (NHSGGC) are currently investigating and managing a contaminated water system across the Queen Elizabeth University Hospital (QEUH) and Royal Hospital for Children (RHC) with probable linked cases of bloodstream infections associated with wards 2A/2B RHC.

Wards 2A/2B RHC is a haemato-oncology unit, also known as Schiehallion, and houses the National Bone Marrow Transplant Unit. In 2016 a patient within ward 2A RHC was identified as having a blood stream infection (BSI) as a result of *Cupriavidus pauculus*. NHSGGC investigations included water samples from outlets within the aseptic suite of the pharmacy department where the parenteral nutrition received by [redacted] was prepared. *Cupriavidus pauculus* was isolated from water samples taken from a tap on a wash hand basin within this area. The wash hand basin was subsequently removed as a result. A further single case of *Cupriavidus pauculus* was identified in September 2017 however no environmental or water sampling was undertaken at this time.

Between the period of 29th January and 26th September 2018, 23 cases of blood stream infections (11 different organisms) with organisms potentially linked to water contamination were identified. As a result further testing of the water supply was undertaken across both hospital sites early in the investigation. This testing identified widespread contamination of the water system. Control measures implemented included sanitisation of the water supply to ward 2A, installation of the use of point of use filters in wash hand basins and showers in ward 2A/B and other areas where patients were considered high risk. Drain decontamination was undertaken and on 26th September 2018 wards 2A/B were closed and patients decanted to ward 6A QEUH and 4B QEUH. There have been no new linked cases identified since the decant of the patients.

NHSGGC requested support from Health Protection Scotland (HPS) with this incident on 16th March 2018 and Scottish Government invoked the national support framework on 20th March 2018 which requires HPS to lead an investigation and provide board support. This report is a summary of the findings from this ongoing investigation for the period of 29th January 2018 – 26th September 2018. Further technical work is being undertaken for NHSGGC by Health Facilities Scotland (HFS).

Background

Health Protection Scotland

HPS plan and deliver effective and specialist national services which co-ordinate, strengthen and support activities aimed at protecting the people of Scotland from infectious and environmental hazards.

They do this by providing advice, support and information to health professionals, national and local government, the general public and a number of other bodies that play a part in protecting health.

HPS is a division of NHS National Services Scotland which works at the very heart of the health service across Scotland, delivering services critical to frontline patient care and supporting the efficient and effective operation of NHS Scotland. The specialist group involved in supporting NHSGGC in this investigation is the antimicrobial resistance and healthcare associated infection (ARHAI) group. The lead from HPS in this investigation and author of this report is a Consultant Nurse in Infection Prevention and Control with a specialist qualification in water and ventilation and is also the national HAI built environment and decontamination lead. HPS have been supporting NHSGGC with this incident since 16th March 2018. This report has been produced with full support from colleagues across NSS.

National Support Framework

The National Support Framework[1] is a structure that sets out the roles and responsibilities of organisations in the event that a healthcare infection outbreak/incident, is deemed to require additional expert support. The National Support Framework may be invoked by the Scottish Government HAI/AMR Policy Unit or by the NHS Board to optimise patient safety during or following any healthcare incident/outbreak(s)/data exceedance or Healthcare Environment Inspectorate (HEI) visit/report. Scottish Government invoked the national support framework[1] on 20th March 2018

NHS Greater Glasgow and Clyde

NHSGGC is the largest health board in Scotland serving a population of approximately 1.2 million people and employ circa 38,000 staff. The main hospital sites covered by this NHS Board are:

- Inverclyde hospitals campus
- Royal Alexandra campus
- Gartnavel campus
- West Glasgow ambulatory care Campus
- Glasgow Royal Campus
- New Victoria Hospital
- Stobhill campus
- Vale of Leven
- Queen Elizabeth University Hospitals Campus

Queen Elizabeth University Hospital (QEUH)/Royal Hospital for Children (RHC)

NHS Greater Glasgow and Clyde's (NHSGGC) Queen Elizabeth University hospital (QEUH) is a 1109 bedded hospital with 100% ensuite single side room. Construction commenced on the £842 million hospital in 2011 which was handed over to the Board on 26th January 2015 with patient migration commencing from 24th April 2015 until 7th June 2015. The adjoining Royal Hospital for Children (RHC) is a 256 bedded childrens hospital which was handed over to the Board on 26th January 2015 with migration of patients occurring between 10th and 14th June 2015. The QEUH and RHC were both fully occupied from 15th June 2015. There are a number of additional healthcare facilities in the surrounding grounds including the maternity unit, neurosurgical unit, elderly care unit and the national spinal injuries unit. The QEUH/RHC is Scotland's largest hospital and replaced a number of existing hospitals from the NHSGGC area including:

- Southern General Hospital
- Victoria Infirmary
- Mansionhouse Unit
- Western Infirmary
- Royal Hospital for Sick Children (Yorkhill)

Introduction

NHS Greater Glasgow and Clyde (NHSGGC) are currently investigating and managing a contaminated water system across the Queen Elizabeth University Hospital (QEUH) and Royal Hospital for Children (RHC) with 23 probable linked cases of bloodstream infections associated with wards 2A /2B RHC. NHSGGC requested support from HPS with this incident on 16th March 2018 and Scottish Government invoked the national support framework[1] on 20th March 2018 which requires HPS to lead an investigation and provide NHS board support. It is recognised that this investigation and remedial action is still underway and may be ongoing for a considerable period, therefore this report is a summary of the findings from this investigation and includes cases and findings for the period 29th January – 26th September 2018.

An initial report was produced by HPS and submitted to Scottish Government (SG) and NHSGGC on 31st May 2018. Due to the ongoing and complex nature of this incident and investigation a further report was requested. This report is a summary overview of this investigation however due to the large volume of data and complexities associated with this incident further technical work is being undertaken by HFS. HPS worked with the support of HFS as the technical engineering experts to support this investigation and report production. In addition the HAI Policy Unit Scottish Government (HAIPU) has requested a separate detailed review of wards 2A/B to be undertaken. This is currently underway and will form a separate report for HAIPU and NHSGGC.

Summary of clinical cases associated with this incident

Case definition

The case definition in place since January 2018 is:

"*any child linked to wards 2A/B RHC with a blood stream infection (BSI) caused by a gram negative bacillus that had been identified from organisms identified within the water system"*

Ward 2A RHC is a haemato-oncology unit, also known as Schiehallion, and houses the National Bone Marrow Transplant Unit and teenage cancer trust. Ward 2B is the day care component of ward 2A. In total there have been 23 cases identified during the period 29th January and 26th September 2018.

2016-2017

In February 2016 a patient within ward 2A RHC was identified as having a bloodstream infection (BSI) as a result of *Cupriavidus pauculus*. NHSGGC investigations included water samples from outlets within the aseptic suite of the pharmacy department where the parenteral nutrition was made that [redacted] had received. *Cupriavidus pauculus* was isolated from water samples taken from a tap on a wash hand basin within this area. Typing by Colindale reference laboratory confirmed the isolate from the washhand basin and the patient were the same. The wash hand basin was subsequently removed as a result. A further single case of *Cupriavidus pauculus* was identified in September 2017. NHSGGC reported that a second hand hygiene sink was found to be positive but following assessment was unable to be removed. Silver hydrogen peroxide treatment was undertaken and repeat testing resulted in zero total viable counts from this outlet.

2018

On 29th January 2018 *Cupriavidus pauculus* was again identified from a bloodstream infection (BSI) in a patient in ward 2A. Following identification of this case a series of investigations were undertaken including water sampling from outlets within the ward area. On 21st February *Pseudomonas fluorescens* was identified from a BSI and between 11th and 16th March 2018, 3 cases of *Stenotrophomonas maltophilia* were identified from patients in ward 2A. On 7th April a further case of *Stenotrophomonas maltophilia* was identified. *Cupriavidas*, *pseudomonas* and *stenotrophomonas* (amongst other gram negative bacillus and fungi) were identified from water samples obtained within wards 2A/B and therefore all cases considered to be linked to the water system. No further cases were reported until April, when between April and June, a further 10 cases were reported: 5 *Enterobacter cloacae*, 3 mixed gram negative bacilli, 2 S*tenotrophomonas maltophilia*. This cluster of mixed organisms, which were present from drain samples prompted the investigation in to the drains within ward 2A/B. Following drain sanitisation and environmental decontamination using hydrogen peroxide vapour, no further cases were reported until 2nd August and between the period 2nd August and 20th September 6 further cases were identified: 1 *Chryseomonas indologenes/Stenotrophomonas maltophilia*, 1 *Serratia marsescens*, 1 *Klebsiella oxytoca*, 2 S*tenotrophomonas maltophilia,* 1 *Enterobacter cloacae.* This latest cluster resulted in immediate further drain decontamination and a temporary decant facility for wards 2A/B being identified, with the patients transferred to wards 6A and 4B on 26th September to allow for investigative and remedial works to be undertaken in wards 2A/B.

In total there have been 23 patient cases identified. A number of patients have multiple organisms so the organism total is greater than the case number.

The organisms linked to cases include:

- *Cupriavidus pauculus* (1)
- *Pseudomonas fluorescens (1)*
- *Pseudomonas aeruginosa* (3)
- *Stenotrophomonas maltophilia* (12)
- *Acinetobacter ursingii* (2)
- *Enterobacter cloacae* (7)
- *Klebsiella oxytoca* (1)
- *Serratia marcescens* (1)
- *Pseudomonas putida* (1)
- *Pantoea sp* (1)
- *Klebsiella pneumonia* (1)
- *Chryseomonas indologenes*(1)

In addition to the organisms detailed above there is evidence of fungal growth in the water system however there have been no associated clinical cases reported.

A timeline of cases is detailed in Appendix 1. This incident has resulted in a number of children requiring additional intervention and some delays in chemotherapy treatment, however, there has been no associated mortality. There have been no associated cases since the temporary closure of wards 2A/B and the decant of the patients to ward 6A QEUH on 26th September 2018.

The clinical component of this incident is considered as occurring within two phases:

- Phase one relates to the water contamination and the clinical cases associated at that time relating to the water system. Following installation of point of use filters, the water system was acknowledged as being of suitable quality for use by patients and staff. Whilst work was ongoing to investigate and manage the water contamination incident the clinical component of this phase was considered over with a debrief held on 15th May 2018

- Phase two relates to the environmental contamination and subsequent associated clinical cases occurring as a result of the contaminated drains and the impact caused by the fitting of point of use filters. Phase two is currently ongoing and will remain open until wards 2A/B have re-opened

Summary of initial findings

Following identification of the potentially contaminated water system in wards 2A/B and the resultant possible linked cases in March 2018, NHSGGC considered the decant of these 2 wards to allow for a full investigation of the source of water contamination in wards 2A/B and consider remedial action. At that time ward 4B QEUH was being prepared for the transfer of adult BMT patients from the Beatson oncology unit. Water sampling was undertaken in this ward prior to decant as a precautionary measure. Results identified the presence of *Cupriavidus pauculus* (and other gram negative bacilli) in water outlets within this ward and was the initial suggestion that there may be widespread contamination of the water system that serves both QEUH and RHC. Further testing across the site provided confirmation of this, with positive samples being identified in a number of areas across both sites at both outlet level and within the water system in the basement level (risers). Within the same timeframe staff within wards 2A/B also reported they had witnessed “black effluent” around the rim of the drain in some wash hand basins. Following visual inspection and laboratory testing, this was considered to be biofilm and sampling identified significant contamination of the drains with microorganisms and fungi. Drain contamination is not unexpected however the level of biofilm evident was not in keeping with a water system of less than four years old.

In an attempt to establish the extent of the water system contamination and any causative factor NHSGGC, supported by HFS and HPS initiated a detailed investigation into the contaminated water system within QEUH/RHC. Support was also requested from a number of external companies experienced in water incident management: These included Leegionella, Public Health England (PHE), water solutions group and Makin & Makin. The detailed investigations led by NHSGGC and supported by HFS/HPS included reviewing commission, installation and maintenance records provided by the contractor. This proved to be challenging due to the archiving of data and there were very few members of the initial project team available who are technically qualified to retrieve data and provide verbal clarification. The detailed findings from these records are included within the technical review.

Results from ongoing water testing were reviewed on a weekly basis and highlighted there was evidence of regressional seeding of contamination which supported NHSGGCs view that a whole system remedial approach was required.

Commissioning and design of the hospital water system

As part of the normal water system commissioning water samples were obtained. Initial preliminary findings have identified that prior to handover from the contractor there were a number of water samples taken that produced results with high level of total viable counts (TVCs). TVCs are indicators that there are hygiene issues within the water system and are quantified as a generic indicator for microbial contamination. Specific microorganisms which can be tested for include: Coliforms, *Escherichia coli (*including O157), *Pseudomonas aeruginosa, Salmonella spp*, *Campylobacter spp* and Environmental Mycobacteria. Testing for these is not conducted as standard within current guidance and typically occurs in response to a suspected or confirmed outbreak, or due to identification of a series of sequential cases.

In response to the high levels of TVCs found as part of the pre handover commissioning sanitisation of the water supply was undertaken by the contractor, with some impact and a reduction in TVCs in most areas, however there are a number of reports which indicate that

there may still have been a number of areas with higher than normally acceptable levels of TVCs.

Design and installation of taps and clinical wash hand basins

The design and construct of wash hand basins, showers and taps in these hospitals were agreed with NHSGGC in line with the Scottish Health Technical Memorandum (SHTM) in place at the point the hospitals were designed (commencing 2009), this included the installation of taps with flow regulators. HFS and HPS were involved in this decision making process as were NHSGGC Infection Control team. The SHTM (SHTM 04-01)[2] was revised in 2015 and no longer supports the use of flow regulators in clinical wash hand basins.

Biofilm formation in flow regulators has been identified in a previously published outbreak.[3] The manufacturers of the taps/flow regulators in place across the QEUH/RHC recommend regular removal of the flow regulators for cleaning/decontamination however do not offer more specific guidance on frequency of decontamination of the flow regulators. The flow regulators in use have a number of components and potentially create ideal conditions for the development of biofilm.

NHSGGC provided an external company (Intertek) with some flow regulators to carry out microbiological testing. This confirmed that flow regulators have the ability to harbour a significant number of micro-organisms with the presence of biofilm being detected on all flow regulators tested and 50% showing high levels of contamination. It is also worthy of note that biofilm was present on some flow regulators which was not immediately obvious on visual inspection.

The taps in place across all clinical wash hand basins in both hospitals are also reported to be non compatible with silver hydrogen peroxide, a product which was used during commission stage to sanitise the water system in view of the high TVC results. It is unclear whether this has caused any degradation of the taps. A tap was deconstructed by NHSGGC and examined for the presence of biofilm, in addition to microbiological sampling. Several components of the tap exhibited microbiological contamination.

The presence of high levels of gram negative bacteria and fungus in the water system may indicate that temperature control required has not always been achieved. Temperature control is included as part of the wider technical review being undertaken for NHSGGC by HFS.

Other aspects discussed in the detailed technical review include:

- Flushing
- Contract/project team
- Roles/responsibilities
- Design and construction
- Guidance and specifications
- Specification of water system
- Flexible hoses
- System description

- Pipe work
- Post handover and maintenance

There are a number of local and national recommendations within this review for both NHSGGC and Nationally. The key NHSGGC and National recommendations from the technical review are included within the recommendation section of this report.

Infection Control at design commissioning and handover

HAI-SCRIBE

Healthcare Associated Infection System for Controlling Risk in the Built Environment (HAI-SCRIBE) [4], reference has been designed as an effective tool for the identification and assessment of potential hazards in the built environment and the management of these risks. HAI-SCRIBE (2007) was in place during the construction and handover of both buildings.

Implementation of HAI-SCRIBE should be the responsibility of a multidisciplinary team of specialists with appropriate skills.

Compliance with HAI-SCRIBE requires an accurate record of the process of hazard assessment and risk management which is essential ‘due diligence’ information.

Evidence has been reviewed in relation to the infection control sign-off of results and the system at commissioning/handover. Whilst there is evidence of involvement with initial results and sanitisation there is no evidence of ongoing input or sign off from the Infection Prevention and Control Team (IPCT). It is noted that there is lack of clarity in current national guidance relating to roles and responsibilities of the IPCT in the commissioning, design and handover of new or refurbished builds. Water was first placed on the Infection prevention and control (IPCT) risk register in 2018. The IPC risk register is reviewed on an annual basis with risks considered and prioritised using a risk scoring system. Water safety was added to the risk register in 2018 in response to the emerging evidence of potential issues associated with this incident. Prior to 2018 water safety did not feature in the IPC risk priorities when scored.

NHSGGC employed a robust approach to the design stage of the hospital project by means of a dedicated Infection Prevention and Control Nurse (IPCN) seconded as part of the project team to support the IPCT aspect of the design stage, commissioning and handover stage.

Whilst there was dedicated resource allocated to the project team, there is no documented evidence of NHSGGC Infection Prevention and Control Team involvement in the commissioning or handover process of the project. However NHSGGC has provided a statement from the Lead Infection Control doctor at the time to confirm that they were involved in reviewing some aspects of the initial water testing methodology and the results for QEUH and RHC during commissioning and handover. The Lead ICD has confirmed being involved in:

- Quality assurance of the water testing methodology used by the commissioning engineers.
- Liaising with Facilities Colleagues in reviewing the water testing results supplied by the commissioning engineers.

- Recommending further actions (dosing), for a small number of outlets with TVCs above the acceptable limits.

In addition to a nurse consultant being seconded as a dedicated resource to the project team with involvement in design, commissioning and handover, the project team were supported by the IPCT. This support included regular review of the new builds hospital project at the infection control committee and senior IPC meetings. NHSGGC reported that both the infection control manager and associate director of nursing (infection control) liaised regularly with the project associate nurse director and ensured the numerous commissioning groups established were supported by a member of the IPCT. In addition all wards were reviewed by a member of the IPCT prior to occupation by patients.

Current management of situation/Control measures

In addition to holding regular incident management IMT meetings (IMT) NHSGGC established a multi disciplinary water technical group which is a sub group of the incident management team. This group is supported by HFS, HPS, with monthly representation from water solutions group and Makin & Makin.

A number of control measures have been instigated during this incident and in particular in wards 2A/B. These included parent and staff education sessions, daily visits to the ward from members of the infection prevention and control team (IPCT), increased domestic hours, environmental monitoring by means of audit, including Standard infection control precautions (SICPs) audits.

Limiting access to water

In the initial investigation the use of water within wards 2A/B was limited with portable wash hand basins being supplied for hand washing. Patients were requested not to use wash hand basins or showers and wipes were provide as an alternative. Drinking water was provided by means of bottled water. Access to water was re-established once point of use filters were in place in showers and wash hand basins/sinks. BMT patients continue to receive sterile water.

Point of Use filters.

Following the identification that the water contamination was widespread across both RHC and QEUH an additional control measure of point of use (POU) filters for high risk areas was implemented to ensure a safe water supply at the point of use. In addition if a high risk patient was being nursed in an area deemed to be of low risk, a point of use filter was fitted to water outlets in their room. POU filters require to be changed every 30 days and are a costly approach, however in the interim until the water contamination can be addressed, is considered the only feasible approach to ensure safe delivery of water. A number of studies found that installation of point of use filters reduced either infection rates in associated healthcare settings[5;6] or pathogen counts within tested water samples.[7]

Once the POU filters were in place the restrictions on access to water within wards 2A/B was removed and patients were able to access washhand basins and showers. It was noted that following the fitting of the POU filters there was a greater splash evident from the wash hand basins as the point of entry of the water from the outlet was closer the basin. This splash was noted more from clinical wash hand basins than ensuite wash hand basins and trough sinks.

Drain Sanitisation

Following the identification of the second phase of cases associated with this incident and the hypothesis that the cases may be related to drain contamination, the drains were inspected by the IPCT. Once the drains were identified as being visibly contaminated with what was thought to be biofilm, a programme of drain sanitisation was undertaken across high risk areas commencing with wards 2A/B.

Environmental decontamination

Prior to and following completion of the first drain decontamination process in wards 2A/B, a terminal clean of all areas using hydrogen peroxide vapour was carried out.

Water treatment

It is well recognised that drinking water distribution systems contain a diverse range of microorganisms.[8-10] The presence of microorganisms is affected by various factors including; the disinfection processes employed, the location and age of the system as well as pipe material.[11]

There were a number of options explored for longer term water treatment by NHSGGC. These options included:

Chlorine dioxide

A number of studies were identified which utilised chlorine dioxide systems within hospital settings, and use of these was found to reduce bacterial numbers.[10,12,13] Various advantages and limitations associated with use of chlorine dioxide are known, with the most relevant summarised below.[14,15]

Advantages**:** Known to be effective against a wide range of bacteria, viruses and some protozoa including Giardia.

Limitations: Production of disinfection by-products (DBP's). Although potential production of DBP's always needs to be considered, the efficacy of water disinfection should not be compromised in trying to eliminate these.[16]

UV light

A number of drinking-water treatment technologies are available which employ UV light radiation to inactivate microorganisms.[15] As with chlorine dioxide, various advantages and limitations associated with use UV are known, with the most relevant summarised below.[14-16]

Advantages: Bacteria, fungi and protozoa (considered to be more effective at killing Cryptosporidium than chlorine dioxide) are readily inactivated at low UV doses, with higher doses required for virus inactivation. In addition, UV disinfection does not result in the formation of DBP's like chlorine dioxide.

Limitations: UV disinfection does not leave any residual compound in treated water and therefore does not offer protection against possible microbial re-growth in distribution pipe-work.

Thermal disinfection

Very limited information was identified in the published literature in relation to advantages and limitations of thermal disinfection. One study found that heat shock treatment at 80˚C reduced Gram negative bacteria in a hospital water system but did not lead to complete eradication.[17] Copper silver ionisation was also considered however this was discounted due to pH levels.

Preferred solution

The NHSGGC preferred method of choice for water treatment was continual dosing chlorine dioxide. This was supported by HFS and HPS. Shock dosing of the system was considered and it was agreed that due to safety issues and the potential impact on both hospitals ability to function during the process, this was not the most appropriate approach. It was also recognised that in the absence of initial shock dosing it may take up to two years for the process to be effective from tank to tap level. The procurement process is well underway and installation expected to commence November 2018.

Temporary closure of wards 2A/B

A recommendation was made by the IMT to pursue the temporary decant of wards 2A/B to allow investigative and remedial work to be undertaken. A number of options were explored resulting in the transfer of patients from wards 2A/B to ward 6A of the QEUH. Adult patients within ward 6A QEUH were transferred to Gartnavel General. Three rooms within the adult BMT (4B) were identified and allocated to the paediatric BMT unit. The patients were transferred on 26th September 2018. It is anticipated that the decant facility will remain in place until mid/late December.

Remedial work/Investigations wards 2A/B

The planned investigations/remedial works planned during the decant period include:

- Drain Survey
- Ventilation review
- Replacement of clinical wash hand basins
- Replacement of taps (with no flow regulator)
- Review of any little used water outlets with a view to remove
- Replacement of sections of pipework where biofilm noted
- Review of toilet cisterns and adaptation to reduce potential toilet plume effect.

Hypothesis

There are a number of workable hypotheses being explored; it is currently considered the most likely cause of the widespread contamination is a combination of hypothesis B and C

A: Ingress contamination

A small low level number of micro-organisms may have been present in the water supply at the point of entry. Lack of temperature or chemical control may have enabled biofilm formation. Due to the increasing biofilm throughout the system this may have allowed any subsequent micro-organisms present at point of entry an opportunity to flourish and cause widespread

contamination of the system.

B: Regressional contamination

This may have occurred due to contamination occurring at the taps/outlets or flow straighteners and contamination has regressed backwards throughout the system causing widespread contamination. The widespread positive results and array of bacteria point to contaminated outlets at installation or contamination of high risk components in the tap from ingress as opposed to the patient contact route.

C: Contamination at installation/commissioning

Contamination may have occurred due to presence of contaminated pipework or outlets. Prior to handover the system required to be sanitised due to high TVC counts. It is unclear if a robust flushing regime was in place from installation to handover and from handover to occupancy to prevent contamination.

Secondary Hypothesis

It is recognised that in many situations control measures or actions taken in an attempt to minimise the risk of HAI there can be unintended consequences. In this scenario the secondary hypothesis is linked to the unintended consequence of the point of use filter use:

POU filters.

In an attempt to provide water of a safe microbiological quality NHSGGC applied point of use filters to all clinical and patient wash hand basins in high risk areas and areas where high risk patients were being treated. These filters meant the exit point of the water from the taps was closer to the washhand basin and as a result caused more splash which may also lead to disruption of any drain biofilm as well as potential environmental contamination. (Pictures 1, 2). At the time of fitting the filters, the issue of biofilm within the drains and the associated risk or the resultant splashing that was being caused had not been identified and therefore the subsequent increased risk of environmental contamination and potential exposure of the children was not recognised.

Picture 1

Picture 2

Additional potential considerations to minimise impact

Ensuite single side rooms/hand hygiene practice

Since 2008 it is recommended that all new build hospitals have 100% en suite single side rooms.[18] As a result this has substantially increased the number of wash hand basins and therefore the frequency with which a wash hand basin is used and the water volume in each basin reduced when compared to multi occupancy wards with a single wash hand basin. Since the introduction and widespread use of alcohol gel, the need for hand washing as a first approach has greatly decreased, as alcohol gel may be used on hands that are not visibly soiled. This requires further exploration and consideration and review of flushing regimes and number of wash hand basins required.

Disposal to drain

A number of drain samples were sent to Intertek for analysis. A report has highlighted that in addition to the general presence of biofilm, there was biofilm noted around the aluminium spigots. There was also some occlusion reported as a result of adhesive and pooling noted between the back of the sink and the pipework. All aluminium spigots in wash hand basins in wards 2A/B were replaced with PVC spigots. In addition a number of foreign objects were identified within the drains. It was also reported that there was evidence of a yellow fluid present suggestive of urine being disposed to the drain. The biofilm has a mustard yellow colour and an odour of ammonia was detected. There was a small amount of yellow liquid in the base of the bowl trap which when removed and looked at in isolation also had an ammonia smell. Parents, families and clinicians are advised that hand wash basins are for hand washing only and additional activities such as fluids being disposed of to drain via a handwash basin should not occur. Staff are aware that this is not acceptable practice however the positioning of a wash hand basin in every ensuite single side room may encourage patients or visitors to expel fluids such as contents of a drink bottle. Items such as coffee, sweet drinks encourage the growth of

bio film and microorganisms within a drain. The large open horizontal drain may also encourage the accidental disposal of foreign items.

Summary

There have been no new reported cases since the decant of patients to ward 6A on 26th September 2018. The IMT will continue to meet regularly until the patients have been transferred back to wards 2A/B. The water subgroup will continue to meet until early/mid 2019 and will be supported by HFS/HPS. It has been evident to HPS that since the identification of this widespread incident and clinical impact on wards 2A/B, patient safety has been paramount with NHSGGC clinicians, facilities, IPCT and management team. A significant financial investment has been made to minimise ongoing risks including widespread use of point of use filters in addition to remedial work planned. A number of lessons can be taken from this incident for NHSGGC and NHSScotland as a whole in relation to water safety and commission, handover and maintenance of buildings. The national work and learning for NHSScotland will be driven via the HAI built environment steering group which is widely represented and chaired by the associate director of facilities (NHSGGC) and deputy chair is the lead ICD (NHSGGC).

Recommendations

A number of local and national recommendations have been made based on the investigation to date. This includes recommendations for NHSGGC which have been identified from a detailed HFS technical review. NHSGGC/HPS/HFS will produce an action plan based on the recommendations as follows:

1. NHSGGC

- To produce a detailed action plan addressing ALL points identified within the HFS technical review and should cover as a minimum:
  - Decontamination
  - The management of the water systems
  - All required rectification work
  - Management of recording systems
  - Routine and reactive maintenance schedules

2. All NHS Boards

- All NHS boards should ensure facilities teams are adequately resourced to ensure maintenance of all aspects of the water system are maintained in accordance with policies and guidance.
- All maintenance undertaken should be recorded and maintenance records should be reviewed regularly to ensure all aspects of the water system are maintained in accordance with policies and guidance

3. HPS/HFS

HPS (supported by HFS) to undertake an urgent national water review of all healthcare premises built since 2013 to provide assurance that a similar incident has not and is not likely to occur elsewhere.

HPS (supported by HFS) to establish a national expert group to:

- Review NHSScotland current approach to water safety including as a minimum:
  - Review NHSScotland current approach to water testing in healthcare settings.
  - Review NHSScotland current surveillance and reporting of potentially linked water related HAI cases.
  - Based on findings develop risk based guidance on water testing protocols, results interpretation roles and responsibilities and remedial steps to be considered.
- Give consideration to the development of a best practice built environment manual which will be evidence based and cover as a minimum current and emerging evidence

and the technical requirements from a clinical, patient safety and HAI perspective that will be adopted by all NHS boards. This will include as a minimum:

- Review existing national and international guidance relating to water safety.
- Develop robust requirements/guidance for all aspects of water safety.
- Develop robust handover requirements in relation to water systems.
- Review of the role of the IPCT into the built environment, and produce clear guidance on roles and responsibilities.
- Establish a risk based approach to water testing and any remedial action required, including roles and responsibilities that NHS boards will adopt.
- Review the requirement for 100% ensuite single side rooms the number of clinical wash hand basins per patient/bed.
- Review the use of flow regulators across NHS Scotland and identify and associated risks and recommend any remedial actions required.

- HPS/HFS will continue to provide support to NHSGGC relating to the current water incident and provide input into the weekly meetings until mid 2019 (and reviewed thereafter).
- Further develop the existing Scottish expertise in the built environment programme (mainly water and ventilation) at national level.

HFS (supported by HPS) to:

- Review all relevant water technical guidance to ensure all aspects are covered within the guidance including as a minimum:
  - Thermal disinfection in sections of water distribution systems
  - Handover checklists
  - Contract management procedures
  - Design guides to eliminate thermal pickup in cold water systems
  - Update advantages and disadvantages of chemical disinfection techniques
  - The organisms Boards should test for and action to take on defined levels
  - Drain cleaning regimes
  - Biofilm growth in drainage systems

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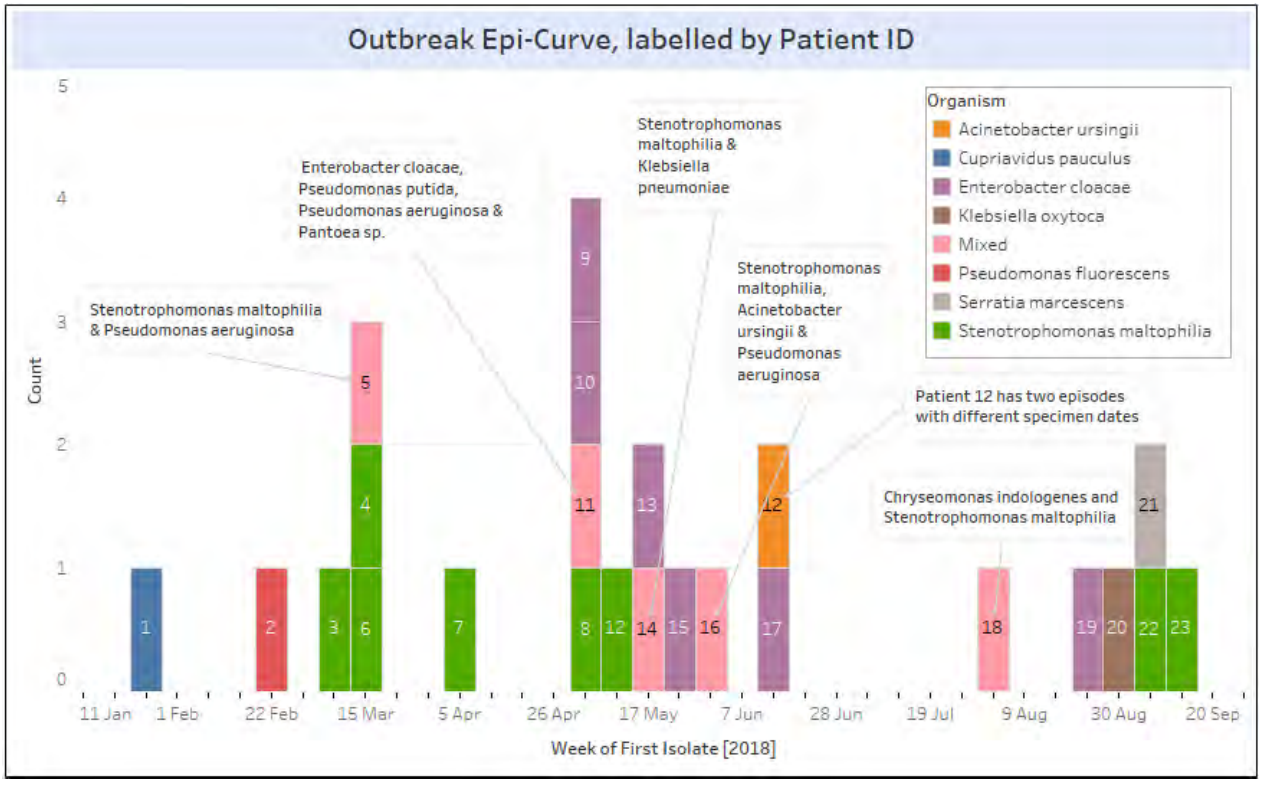
Appendix : 1 Timeline of cases

The epi-curve demonstrates that only one case of *Cupriavidus pauculus* was reported from 26th January 2018, with the other associated cases being *Stenotrophomonas maltophilia* and/or *Pseudomonas aeruginosa* positive between 21st February 2018 and 5th April 2018.



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Glossary

Alcohol gel	A gel, foam or liquid containing one or more types of alcohol that is rubbed into the hands to inactivate microorganisms and/or temporarily suppress their growth.
Aseptic Suite	An ultra clean environment within a department, (for example pharmacy) where sterile solutions are prepared such as chemotherapy under strict measures.
Bacteria	Microscopic organisms (germs).
Bib taps	A tap or stop cock which has a nozzle bent downwards.
Biofilm	Collective of one or more types of microorganisms, including bacteria, fungi and protists, that stick together and can become embedded on a surface.
Blood stream infection	The presence of bacteria in the bloodstream.
Chemotherapy	A cancer treatment where medication is used to kill cancer cells.
Chlorine dioxide	A chemical compound used for a variety of antimicrobial uses, including the disinfection of drinking water.
Clinical wash hand basins	A sink designated for hand washing in clinical areas
Cluster	A group of similar things located around the same location
Copper silver ionisation	A disinfection process where positively charged copper and silver ions are added into the water system. It is primarily used to control control Legionella, the bacteria responsible for Legionnaires' disease.
Decant	Temporarily transferring people to another location.
Decontamination	Removing, or killing pathogens on an item or surface to make it safe for handling, re-use or disposal, by cleaning, disinfection and/or sterilisation.
Drain	A fixture that provides an exit-point for waste water or water that is to be re-circulated.
Ensuite single side room	A room with space for one patient and containing a bed; locker/wardrobe, clinical wash-hand basin, en-suite shower, WC and wash-hand basin.
Flexible hoses	A flexible hollow tube designed to carry fluids from one location to another and are used to connect taps to the water supply
Flow regulators	Point of use regulators designed to provide constant and maximum flow rates at taps and showers etc. irrespective of changes in demand or water pressure

Flushing	The process of cleaning or “scouring” the interior of water distribution mains (pipes) by sending a rapid flow of water through the mains.
Gram negative bacilli	Gram-negative bacteria are bacteria that do not retain the crystal violet stain used in the gram-staining method of bacterial differentiation; examples include E.coli, and Pseudomonas aeruginosa.
Hydrogen Peroxide Vapour	Vaporized hydrogen peroxide is an airborne disinfectant and infection control measure that can be used for room decontamination after patient use.
Ingress	The act of entering.
Microbiological sampling	Sampling for harmful bacteria, parasites, fungi and viruses including those in water, environment and equipment.
Micro-organism	Any living thing (organism) that is too small to be seen by the naked eye. Bacteria, viruses and some parasites are microorganisms.
Organism:	Any living thing that can grow and reproduce, such as a plant, animal, fungus or bacterium.
Parenteral nutrition:	The giving of special liquid feeding products to a person using an intravenous catheter and bypassing the normal digestion process of the stomach and bowel.
Pathogen:	Any disease-producing infectious agent
Point of use filters:	A device that incorporates an integral filter with a maximal pore size of 0.2 µm applied at the outlet, which removes bacteria from the water flow therefore protecting the end user from exposure to harmful waterborne pathogens.
Portable wash hand basins	A sink that is not connected to the mains water supply but connects to a water tank which is filled locally.
Regressional seeding	Where micro-organisms from contaminated water outlets/biofilm regress ‘back’ through the water system and seed other areas (pipes/tanks/outlets). The microorganisms embed themselves and multiply contaminating other areas of the system.
Sanitisation	Use of antimicrobial agent on objects, surfaces or living tissue to reduce the number of disease-causing organisms to non-threatening levels.
Shock dosing	The use of large quantities of chemicals to the water supply to break down organic waste and get rid of bacteria and contamination.
Silver hydrogen peroxide	A solution of stabilised silver in hydrogen peroxide that is used for surface and water decontamination.

Sterile water	Water free of all microorganisms – bacteria, viruses, fungi.
Terminal clean	Cleaning/decontamination of the environment following transfer/discharge of a patient, or when they are no longer considered infectious, to ensure the environment is safe for the next patient or for the same patient on return.
Thermal disinfection	The use of water and heat for the disinfection process for example washer-disinfectors.
Toilet plume effect	The dispersal of microscopic particles as a result of flushing a toilet.
Total viable counts	A quantitative estimate of the concentration of microorganisms such as bacteria, yeast or mould spores in a sample.
Trough sinks	A long, narrow basin designed for communal handwashing with water delivered at hand-washing temperature via mixer taps in conjunction with a thermostatic mixing valve. Usually used for surgical scrubbing.
UV light	A disinfection method that uses short-wavelength ultraviolet (UV-C) light to kill or inactivate microorganisms.
Water outlets	Any hole or opening where water is released for example taps, showerheads.
Water sampling	The analysing of the water supply for harmful bacteria, parasites, and viruses.
Water system	A system of engineered hydrolic and hydraulic components to supply water.
Spigots	A short cylindrical pipe which connects the Clinical Wash Hand basin to the main pipework.
Occlusion	Obstruction or blockage

NHSS Assure: Response to Questions regarding NSS involvement as requested by NHS GGC in respect of all or any Cryptococcus incidents at QEUH/RHC between 2018 and 2022.

1. **Confirm why NSS attended the Cryptococcus Sub-Group IMTs and not the IMTs in respect of Cryptococcus incidents at QEUH/RHC between 2018 and 2019;**

   Response: NSS were not invited to attend the Incident Management Team (IMT). Health Facilities Scotland (HFS) and Health Protection Scotland (HPS) representatives were invited to attend the Expert Advisory Group by NHS Greater Glasgow and Clyde (GGC).

2. **In respect of the Report from the Cryptococcus Incident Management Team Expert Advisory Sub-Group dated 5th April 2022:**
   a. **Provide confirmation of when this report was submitted/ sent by NHS GGC to NSS, along with any accompanying correspondence.**
   b. **Details of the response, if any, from NSS in respect of the report, along with any communications from NSS to NHS GGC in respect of the views of NSS regarding the report.**
   c. **Details of why NSS did not approve the final report of the IMT sub-group, and any communications provided to NHS GGC by NSS in respect of this matter.**

   Response: As agreed, a response will be submitted by 17th April 2024.

3. **Full details of all or any engagement from NHS GGC in respect of Cryptococcus cases in Ward 6A in or around July and August 2020, to include but not limited to details of all support given, advice tendered, and actions followed up on. If within the knowledge of NSS full details of the reporting action taken by NHS GGC in response to Cryptococcus in Ward 6A in or around July 2020, including any NSS, ARHIORT or other reporting action taken including HIAAT ratings, actions taken in response to any advice given by either internal or external agencies**.

   Response: Information contained in the documents and emails provided contain Patient Identifiable Information which if put into the public domain would likely mean individual patients could be identified. We request this information is not placed into the public domain.

   NHSGGC reported a possible Cryptococcus case on 02/07/2020 via Healthcare Associated Infection Outbreak Reporting Tool (HAIORT) as per document number 2. Healthcare Infection Incident Assessment Tool (HIIAT) Green support from ARHAI requested. ARHAI Nurse Consultant attended the IMT on 02/07/20. NHSGGC closed the incident on 09/07/20 as per document number 9 following confirmation for the Reference Lab in Bristol that the sample was negative. Details of actions reported to have been taken by NHSGGC within the HAIORT. Additional relevant emails have been provided numbered 1 and 3 to 8.

4. **Full details of any further engagement from NHSGGC in respect of any cases of Cryptococcus cases in QEUH/RHC from July 2020 to date, to include but not limited to details of all support given, advice tendered, and actions followed up on.**

   Response: No further incidents relating to Cryptococcus have been reported into ARHAI by NHSGGC since the possible case reported on 02/07/20 as referenced in response to Q3.

Report of Issues raised by Dr Teresa Inkster to Medical Director

C Deighan: Deputy Medical Director – Corporate

May 2021

1. Background

On 1/10/2019, Dr J Armstrong Medical Director GG&C, emailed Dr C Deighan, Deputy Medical Director: Corporate GG&C, regarding issues raised by Dr Inkster, Consultant in Microbiology & Infection Control in the context of whistleblowing communication to Health Protection Scotland (HPS) and Dr Inkster's letter to Dr Armstrong in which she resigned as Lead Infection Control Doctor for GG&C (**Appendix A**).

Initially, it wasn't clear if these issues were being taken forward as part of the internal whistleblowing investigation however subsequently Dr Deighan was asked to review the issues raised namely

- SCI process
- Duty of candour regarding infection control incidents
- Governance relating to specialist groups reporting to Incident Management Teams (IMTs)

Dr Deighan asked Dr R Green (Chief of Medicine for Diagnostic Services and medical line manager to Dr Inkster) to interview Dr Inkster to get a fuller account of these issues. This interview took place on 06/01/2020 and is detailed in **Appendix B**.

Subsequent to this interview, information has been gathered from a number of sources in order to compile this report. This has included review of:

- The process that underpinned the 'Cryptococcus' SCI reviews. This was undertaken by Mr Andy Crawford, Head of Clinical Governance – Section 3.1
- Letter from Board Medical Director to parent involved in Duty of Candour Incident provided by Jen Haynes, Head of Complaints – Section 3.2
- Letter of response by GG&C Chief Executive to a letter of complaint from parent involved in Duty of Candour Incident provided by Jen Haynes, Head of Complaints – Section 3.2
- Minutes and Action Plan of the Paediatric Oncology IMT within the timeframe outlined in **Appendix A** along with accompanying documentation provided by Calum MacLeod, Infection Prevention & Control Administrator – Section 3.3
- The Greater Glasgow and Clyde Outbreak and Incident Management Plan (4th Edition) - Section 3.3
- The Water Technical Group minutes from 06/04/2018 to 17/04/2020 – Section 3.3
- The Terms of Reference of the NHS GG&C Infection Control in the Built Environment Group Section - 3.3

- The Queen Elizabeth University Hospital campus 'Inspection Report – Safety and Cleanliness of Hospitals' from Health Improvement Scotland (HIS) plus the subsequent Action Plan Section - 3.3

Dr Deighan has not interviewed anyone else directly involved with the issues outlined apart from clarifying with Mary Anne Kane, Associate Director of Facilities and Chair of Water Technical Group re the role of this meeting in IMT process – Section 3.3

Much of the background information for this report was collated in early 2020 following the interview with Dr Inkster however the writing of this review has been significantly delayed by the Covid-19 Pandemic from March 2020 onwards.

2. Declaration:

CD attended three of the IMT meetings in summer of 2019 deputising for the Deputy Medical Director: Acute, when not available. As a result, CD was interviewed as part of the Internal GG&C Whistleblowing Investigation. CD contributed to the writing of the letter from Board Medical Director to the parent involved in Duty of Candour Incident. CD has worked with Dr Inkster as a colleague in the past and they have co-authored 2 publications in 2017.

3. Issues raised

3.1 SCI process

When interviewed, Dr Inkster Noted:

> *… concerns were that non experts had intervened and removed what was thought to be correct detail without her being asked to agree it and this had changed the whole sense of the document. Document control had been poor. Having asked for the SCI she has not seen a final version of the SCI which was to be shared with the patients and families and nor does she know if it has been sent.*

Review of two SCIs relating to patients experiencing Cryptococcus infections

The SCI process is intended to reflect on the quality of clinical care, to identify any lessons that may improve the quality of care and support explanation to patient, families and outside agencies as to the potential causes of incidents affecting the quality of care. The SCI process is founded on root cause analysis and is a well established approach, supported by a mature policy framework, but does have limitations. It is clear the SCI process in these instances did not proceed smoothly.

The patient deaths in December 2018 and January 2019 did not prompt an incident report or a SCI review at the time. The application of the SCI process was instigated in the two providing services (paediatrics and oncology) upon the receipt of complaints in February 2019. This is not unusual as the SCI model can provide a robust and helpful investigation framework. The initial application of the SCI process seemed reasonable at the time.

The interaction with the family confirmed a key question regarding the source of the organism thought to have infected the patients and potentially contributed to their death. In the early phases

of the SCI it seemed reasonable to include this question. However as the complexity of the situation developed, it became inappropriate to maintain this question as part of the terms of reference for the SCIs. When the Board initiated additional independent investigations into the hospital systems and the potential role of pigeon flock in exposing patients to the organism, this element of the terms of the SCI should have been withdrawn.

As time progressed there was increasing corporate interest given the significant risk concerns and other organisational sensitivities associated with the initial theory of the source of the organism. The responsibility for SCIs is often seen as local to services and the need for corporate management was not easily progressed. When the Board sought to redefine the terms of investigation this became complicated and anxieties about being perceived as unduly influencing the investigation report delayed a more robust definition of the scope of the investigation report.

The conclusion of investigation reports is generally a process of securing consensus across the clinical team, the investigation team, the investigation lead and the SCI commissioner. This is normally a smooth process but where dispute arises it can lead to a significantly more complicated process of resolution. The duration of investigation and issues surrounding these SCIs resulted in very complicated process of report finalisation. Ultimately the services commissioning the investigation reports had to take decisions regarding the content and how these would be shared with the family, whilst acknowledging the role of local opinion along with the conclusions of other review processes. The finalisation of the reports in this way is an infrequent requirement but it is not unique and occurs where consensus is not secured between all parties.

As already noted, Dr Inkster was interviewed in January 2020. The final draft report of the Oncology / Regional Services SCI was shared with all of the reviewers on 12th March 2020 with a view to sharing this factual report with the family of the patient. This report confined its terms of reference to the clinical care received as an in-patient, noting that the report from the Expert Advisory Group would provide additional information on the hospital systems and the potential role of pigeon flock in exposing patients to the organism. Dr Inkster and the other reviewers were invited to put any concerns they had with this approach, in writing to the Director of Regional Services. No reply was received from Dr Inkster or any of the other reviewers (**Appendix C**)

The final report was signed off in April 2020 and shared with the family. Following this, a meeting was arranged between the family and senior representatives from GG&C. This meeting took place on 30th September 2020 and involved the Director for Acute Services, Deputy Medical Director: Acute, the patient's consultant and senior clinicians from Microbiology and Infection Control, including Dr Inkster. Prior to the meeting, the family wrote to GG&C with a number of questions regarding the SCI report. These were subsequently answered in a written reply in October 2020.

NHS GG&C's SCI policy was due for revision in 2020. Consequently it was agreed that the process of corporate commissioning of SCIs should be set out more explicitly in the updated policy. This process of corporate commissioning has been included as a safeguarding mechanism and to ensure that all staff are aware that there is a process that underpins resolution of disputes and procedures in the context of an SCI review. This has been included in the refreshed version of the policy (now entitled Serious Adverse Event Reviews – SAER) which was approved in August 2020. In addition, the linkage between IMTs/IPCT (Infection Control and Prevention Team) and the Board policy framework (including the SAER policy) is included within the action plan for the Independent Review Report of Queen Elizabeth University Hospital.

3.2 Duty of Candour Incident

When interviewed, Dr Inkster Noted:

> *In 2018 an immune-compromised child became infected with an atypical mycobacterium likely from water. It was reported as an unusual organism to HPS and from there to SG as per standard process. They didn't test the water at that time as control measures ie filtration had subsequently been put in place. 18 months later a second child became infected and so an IMT was called. This was found to have come from water in theatres which had not been filtered. TI was to perform DoC with both families to alert to this finding. However when telling the first patients [redacted] , she and the GM for the area were stopped as they were told a letter was going from the Chairman to this parent as a number of other issues had been raised. TI then met with the [redacted] about other issues and it became apparent that he had not been told about this and so felt that telling the truth about the investigation and findings was the only course to be taken. She was told by the Lead Nurse for Infection control that she was not to tell the [redacted] this detail. At this point TI felt that she needed to take advice from the GMC who advised her to whistle blow out with the organisation which she did to Fiona McQueen in SG.*
>
> *TI concerned that obligations to tell the truth and communicate freely with parents and patients is being undermined*

This specific incident is referred to in a letter from the Chief Executive to the parent in question from Feb 2020. The text of the letter with the response is outlined below:

> ***5a: Contents of IMT minute and sharing of information at a meeting with Dr Inkster and Mr Redfern.***
> *I am acutely aware that this is an ongoing cause of concern for you, and for that I am truly sorry. With regards to your concern about the content of an IMT minute to action communication to you following confirmation of a second case of Mycobacterium chelonae, when this second case became known to us, it was first discussed at an IMT meeting on 19 June 2019. XXXX's case was also discussed at that meeting, given it was the same type of infection, albeit over a year previously. At an IMT meeting on 25 June 2019, it was confirmed that a process to contact your family to let you know about the second case would be confirmed. I am aware that around this time you were in contact with the Chairman of NHS Greater Glasgow and Clyde, and it was confirmed at the IMT meeting on 1 August 2019 that you and Mr Jamie Redfern, General Manager, were in ongoing contact.*
>
> *I am aware that you then met Dr Teresa Inkster, Infection Control Doctor and for a period, Chair of the IMT, and Mr Redfern, on 14 August 2019. Before the meeting, Mr Kevin Hill, Director of Women and Children's Services, reminded both Dr Inkster and Mr Redfern that due to patient confidentiality, they could not discuss any other patient or family, and that investigations were still on-going through the IMT meetings.*
>
> *I know you have concerns about this meeting, but I am assured that a senior member of staff was trying to balance ensuring that your family and the other patient's family were advised of as much information as possible, whilst ensuring patient confidentiality, and in a way that was thoughtful, appropriate and timely. I am truly sorry for the suspicion, worry and distress resulting from the fact that the actions following this discussion resulted in you not receiving any information, and completely understand your strength of feeling regarding this*

experience. Working with the Communication and Engagement Sub-Group, we will review the timeliness of such communications.

The GMC notes that every healthcare professional must be open and honest with patients when something that goes wrong with their treatment or care causes, or has the potential to cause, harm or distress. This is referred to as professional duty of candour. Since 2018, there is also a Legal Duty of Candour responsibility where a patient has suffered moderate or severe harm and that harm has resulted from the incident rather than the patient's illness or underlying clinical condition.

NHS GG&C's Duty of Candour Policy notes that it is both an ethical responsibility, as well as a professional and statutory requirement for health care professionals and managers to inform patients who have suffered as a result of a safety incident that was caused by the organisation and has resulted in harm. It is also recognised that being open and honest is a requirement to both improve patient safety and the quality of health care systems. NHS GG&C's Duty of Candour Policy includes details of definition, responsibilities, principles, recording and policy implementation.

(http://www.staffnet.ggc.scot.nhs.uk/Corporate%20Services/Clinical%20Governance/Clinical%20Risk/Duty%20of%20Candour/DoC%20Policy%20and%20Guidance%20GGC%20Final%20v1%20(2018).pdf)

In addition, the GG&C Infection Prevention and Control Assurance and Accountability Framework notes that Duty of Candour is considered as a standing agenda item at every IMT meeting and members of the IPCT are required to follow the NHGGC Duty of Candour Board Policy.

It is the principle of professional duty of candour and both NHS GG&C's Duty of Candour Policy and GG&C Infection Prevention and Control Assurance and Accountability Framework that the IMT and Dr Inkster were following when it was confirmed at the IMT meeting that Dr Inskter and Mr Redfern were to meet the parent in question

It is clear from Dr Inkster's statement and GG&Cs letter to the parent, that there are differing views regarding this episode. Dr Inkster clearly perceives that her duty to '*tell the truth and communicate freely with parents and patients was being undermined*' whereas the letter from GG&C notes that the senior member of staff was '*trying to balance ensuring that your family and the other patient's family were advised of as much information as possible, whilst ensuring patient confidentiality, and in a way that was thoughtful, appropriate and timely*. '

On 7th January 2020, the NHS GG&C Board Medical Director wrote to the parent in question. This letter outlined a review of the case of infection and how this case was reported both internally and to Health Protection Scotland. Dr Inskter along with the Lead Infection Control Doctor and the Chair of the IMT all contributed to the writing of this letter which detailed the reporting of the infection.

In summary, it is clear, that this was a complicated scenario that involved communication with more than one family, with the need to maintain professional confidentiality. Communication during this episode was sub-optimal. This may reflect the complicated nature of the scenario however as noted in subsequent correspondence, it led to the parent not receiving any information and leaving a feeling of suspicion, worry and distress. The Board Medical Director has subsequently written to the parent with a detailed review of the case of infection and how it was reported. Dr Inkster and the Lead for Infection Control were involved in drafting this letter and as a result, GG&C has been open and transparent with the parent. The Chief Executive of NHS GG&C has apologised for the poor communication in a letter to the parent as noted above.

3.3 Governance of External Meetings Feeding into IMTs

When interviewed, Dr Inkster Noted:

> *An IMT in June 2019 asked for increased Chlorine Dioxide to be added to the water as the control measure for the atypical Mycobacterium. The Estates department did not take this forward but asked for External advice (from an expert on Legionella) who said this was not required. This message was not brought back to the IMT who had asked for it. The water technical group has made decisions where these were not minuted nor discussed at IMT. TI was asked not to sit on any of the specialist groups as she was apparently influencing the outcomes from these groups.*

Dr Inkster was chair of the IMT up to and including the meeting on 14/08/2019. Dr Emilia Crighton, Deputy Director of Public Health, chaired the IMT from 23/08/2019. The Water Technical group (WTG) was set up as a subgroup of the IMT with Mary Anne Kane, Associate Director of Estates and Facilities as chair. No terms of reference, clear remit or fixed membership of this sub group appear to have been established. Dr Inskter as well as being chair of the IMT, appears to have been the link from the WTG to the IMT and attended the majority of the WTG meetings. However there was also regular attendance at the WTG from Health Protection Scotland (Annette Rankin: Nurse Consultant Infection Control), Public Health (Dr Ian Kennedy) and Microbiology (Dr J Hood, Consultant Microbiology). The chair of the WTG did not attend the IMT.

The IMT minutes and action plan from the meeting of 25/06/19 note that: Increase dosing of chlorine dioxide is to be undertaken to the water supply. This is recorded as complete in the IMT action plan and dated 01/07/2019. This is supported by the 'Three Stage Action Plan' document from Mr Ian Powrie (Deputy General Manager: Estates) from 01/07/2019 which notes increased chlorine dioxide treatment from 0.3 to 0.5PPM implemented on Thursday 27th June 2019.

This action plan, entitled 'Atypical Mycobacteria Species (AMS) Infection Control Doctor (ICD) Request Domestic Cold Water: Three Stage Action Plan', was developed to support the ICD request further to initial water samples having returned positive for Atypical Mycobacteria Species (AMS). This action plan was tabled at the Water Technical Group on Friday 16/08/2019 for noting and discussion. This meeting was attended by Dr Inkster, Dr Hood and Dr Kennedy. The Three Stage Action Plan was emailed to the IMT membership on 19/08/2019.

The minutes of the IMT meeting from 03/07/2019 note that 'The water group are currently looking into using a higher dose of chlorine dioxide solution to the water supply (shock dosing)'. Subsequently, the IMT action plan from 23/08/2019 notes: 'Increase the dosing of chlorine dioxide to 0.7PPM'.

Regarding the meeting of the Water Technical Group on 16/08/2019, minutes from meeting attended by Dr Inkster, Dr Hood and Dr Kennedy, record under Chlorine Dioxide dosing:

> *The group discussed whether we should increase the dosing further to 0.7. It was noted that there was Mycobacterium Chelonae in the water with some outlets at >100 cfu. This had been linked to a recent IMT and a patient case with whole genome sequencing establishing the patient isolate to a water isolate (13 snps apart). It was noted the work of Falkenham at Virginia Tech relating to atypical mycobacteria in pipework and TI expressed concern that*

> *low dose Chlorine Dioxide might be encouraging proliferation of atypical bacteria within the system.*

There is then a tracked change which adds

> *IK (Dr Ian Kennedy) noted that the literature he had reviewed suggested the small increase from 0.5 to 0.7 ppm was unlikely to have a major effect and a much higher doseage, around 1.2ppm may have to be considered. That was not felt to be feasible be (by) Estates colleagues given the engineering challenges and potential impact on services.*

The minutes also note under AOCB

> *TI noted her concerns re governance. TI noted that decisions were being made between local teams and experts out with the IMT and Water Technical Group (WTG) Meetings and TI was concerned about the lack of documentation and flow of information control.*

As noted above, the IMT Action Plan from 23/08/2019 records as an action: 'Increase the dosing of chlorine dioxide to 0.7PPM'. This post-dates the meeting of the WTG. Further status notes from 13/09/2019 (but not all dated) record in the Action Note:

> *Dosing of chlorine dioxide to 0.7 PPM may be a potential lease of Biofilm and this could be a risk in the short term. Facilities to check if this should be carried out for the whole of the hospital. Tom Steele to discuss this with external advisors and will share this with Infection Control. Written support from technical advisors. Awaiting for water group approval from IPCT to see if this can be undertaken. Need collective approval unsure who do we ask for approval? What is the governance around the water dosing of water is. Is the interventional still justified? Further increase is to deal with mycobacterium within the system. Is this an action in relation to the current IMT Other measures that have been in place are sufficient and no new cases have been reported since this implementation. Prof Brian Jones does not think increasing the PPM is required. Action Closed. Maintained dosing at 0.5 PPM*

What is not clear from the Action note, are the dates that each of these comments were added, nor is there any note of details of discussion regarding Action points in the minutes of the IMT meetings. Moreover in discussion with the secretariat, the Action note appears to have been kept as a rolling document and therefore it was not possible to go back and interrogate when additions were made.

The minutes of the August WTG meeting appear to be incomplete and members of the WTG group including Dr Inkster all had the opportunity to comment. Dr Inkster received a copy of these minutes as did the rest of the WTG members. The tracked changes from Dr Kennedy between Aug and Sept provided the secretariat with requested changes. Dr Inkster was copied into the September meeting notes although she did not attend the September meeting of the WTG. From the minute of the meeting of September 2019 regarding the August minutes it states 'The notes of the meeting were recorded as an accurate record of the meeting but required some additional information to complete'. Dr Inkster as a member of the WTG would have been copied into September note of the meeting. Therefore Dr Inkster would have had the opportunity to discuss any aspects of the water treatment at the WTG meeting in August and the opportunity to comment on the minutes of WTG meetings as she was included in the circulation of these minutes

The IMT Action note clearly outlines that this further increase in dosing of Chlorine Dioxide was agreed as an Action on 23/08 but was discounted following discussion at both the WTG and IMT.

3.3.1 Comments on IMT & WTG Documents

- There is clear documented evidence that the request from June 2019 to increase chlorine dioxide to the water whilst Dr Inskter was chair of the IMT was both requested and actioned
- The WTG appears to have been established as a sub group of the IMT but without ToR, defined remit, clear membership and the chair of the meeting was not a participant in the IMT
- The Estates department took forward and tabled a paper regarding Chlorine Dioxide dosing. Dr Inskter was present when this was tabled at the WTG with respect to further increased Chlorine Dioxide dosing and would have had the opportunity to comment and feedback at that point. It was also circulated to members of the IMT and there would have been the opportunity for any member to ask for it to be tabled and discussed.
- Clear actions regarding plans for water treatment with Chlorine Dioxide are outlined in the IMT action plan however the Estates paper tabled at the WTG does not appear to have been tabled at one of the IMTs. This was clearly a missed opportunity but may have been affected by the change in chair of the IMT at that point and the lack of clarity regarding reporting arrangements between the WTG and IMT
- A further increase in dosing of Chlorine Dioxide was agreed as an Action on 23/08 but was discounted after discussion at both the WTG and IMT. This may be the action that Dr Inkster refers to (but with the wrong date) however this does appear to have been discussed both at the WTG and IMT and therefore it does appear that appropriate governance for this decision, was in place
- The minutes of the Water Technical Group note that Dr Inkster was a member of and attended meetings. Therefore Dr Inkster would have had the opportunity to discuss and influence outcomes of papers tabled at this meeting
- The minutes of meeting from 16/08/2019 do not appear to have been finalised
- The Chair of any IMT carries a significant responsibility, including considering potential hypotheses regarding the source of infections. They are also responsible for leading the discussion at meetings and considering papers tabled at the meetings. Consideration should have been made for the Chair of the IMT to have delegated responsibility of linking the WTG and IMT to the Chair of the WTG and also consider delegating microbiology input at the WTG to another clinician from the ICT.

3.3.2 Infection Control in the Built Environment

In January 2019, the Queen Elizabeth University Hospital campus was subject to an unannounced inspection by Health Improvement Scotland (HIS). The subsequent report '*Inspection Report – Safety and Cleanliness of Hospitals*' was published in March 2019. The first requirement of the report was that '*NHS Greater Glasgow and Clyde must improve the governance arrangement in both estates and infection prevention control teams to assure themselves of safe patient care in line with Scottish Government's guidance'*.

To address the issues raised in the report, a Board Level action plan was agreed and submitted to HIS. This included establishing the NHS GG&C Infection Control in the Built Environment Group. This first met in July 2019 and has representation from infection control including Board Infection Control Manager, Associate Nurse Director Infection Prevention & Control, Consultant Microbiologist, Lead Infection Prevention and Control Doctor, and Nurse Consultant Infection Prevention & Control.

The Terms of Reference for this group are in **Appendix D**.

These ToR Note:

The overarching remit of the ICBEG is to reduce the risks of infection to patients members of the public and staff with the key objectives noted below:

- *To systematically co-ordinate activity in respect of infection control within the built environment;*
- *To professional, managerial and governance oversight of all aspects of the built environment;*
- *Ensuring compliance with appropriate statutory instruments and mandatory guidance;*
- *Ensuring effective application of guidance and standard operational policies.*

Membership includes Key representatives from Acute Clinical Governance Forum, Board Clinical Governance Forum, Acute Infection Control Committee (AICC) and Board Infection Control Committee (BICC). Updates are provided to Acute Infection Control Committee (AICC) and Board Infection Control Committee (BICC).

As a consequence, there is now a clear and robust governance structure linking estates and the Built Environment with infection control, with appropriate reporting into Infection Control and Clinical Governance Structures

3.3.3. Governance of Incident Management

In February 2020, the Greater Glasgow and Clyde Outbreak and Incident Management Plan was revised (4th Edition) - **Appendix E.** This revision, which had commenced in late 2018, was approved by NHS GGC Corporate Management Team on 5th March 2020. The introduction notes:

The purpose of the plan is to provide those responsible responding to incidents and outbreaks, and those responsible for monitoring that process, with an agreed understanding to facilitate effective and consistent response.

This document provides updates the management of IMTs. This includes guidance on Roles and Responsibilities, Management of Complex Incidents, Escalation Process, Governance, Documentation and Performance Assessment.

Specifically with reference to this report, this includes (note that numbers are from Outbreak and Incident Management Plan):

(i) Chair of IMT:

24. In complex incidents, consideration should be given to the membership including a second Consultant in Public Health Medicine (or ICD depending on chairing arrangements), so that there is

no expectation that roles of chair and of provision of specialist expertise will fall on a single individual.

(ii) Sub-Groups

43. The IMT may wish to set up subgroups (or "cells") to carry out detailed investigations or completion of tasks to allow the full IMT to maintain focus on strategic priorities and the overall incident management. Any subgroup will have a named lead who will be a full IMT member, and a terms of reference detailing the remit, scope and limits of delegated authority of the subgroup. Subgroups may include members who are not members of the full IMT. Membership will be agreed, in consultation with the IMT, between the Chair and the cell lead.

44. Any subgroups will report directly to the IMT. The IMT will not normally rehearse the detail of discussions in the subgroup, but will expect clear and regular reporting of any decisions/actions/recommendations to the IMT, and detailed recording of the rationale of those decisions, to provide assurance/oversight, as the IMT retains responsibility for the activities of the subgroup.

(iii) Escalation

If a member is not supported by their organisation to agree to the consensus position, and this cannot be resolved by the IMT chair, then it must be escalated to a higher executive level, the Director of Public Health in the first instance, and if necessary to the chief executives of the organisations involved.

The updated guidance also outlines the potential need for peer support for the Chair of an IMT, if the IMT cannot resolve an issue by consensus or if urgent decisions are required between IMT meetings.

3.3.4. Summary - Governance of External Meetings Feeding into IMTs

- Dr Inkster raised the concern that the Estates department did not take forward a request from the IMT in June 2019 for increased Chlorine Dioxide to be added to the water as the control measure for the atypical Mycobacterium. There is clear documented evidence that this is not correct and that this action was implemented as requested.
- There was a further request to increase Chlorine Dioxide but was discounted after discussion at both the WTG and IMT and appropriate governance underpinning this decision appears to be in place.
- Issues with the commissioning of the WTG and the relationship of this technical group to the IMT are identified. This highlights the importance of clear and robust linkage between the governance of estates and infection control. This is now underpinned by the setting up of the Infection Control in the Built Environment Group in July 2019 following the HIS inspection of the QEUH campus in January 2019.
- Issues with the governance of IMTs are highlighted. These issues all appear to be addressed in the updated Greater Glasgow and Clyde Outbreak and Incident Management Plan (4th Edition) which was approved by the Corporate Management Team in March 2020.

4. Summary

This report has confined itself to a review of the issues raised by Dr Inkster primarily by reviewing available documentation along with a review of the SCI process. Given the multiple investigations and enquiries that are either ongoing or have already concluded, it has deliberately not set out to interview additional stakeholders beyond the initial interview with Dr Inkster by Dr Green that was commissioned to get a fuller account of the issues under the broad headlines raised by Dr Inkster in her initial email correspondence.

In the course of communication with the Board Medical Director, Dr Inkster raised a number of concerns. These concerns have been explored in detail and this review is unable to corroborate the specific concerns that were raised in her initial correspondence. In the process of carrying out this review a number of additional considerations have arisen with respect to SCI (SAER) policy, Infection Control in the Built Environment and also the Governance of Incident Management. However on further examination, it is clear these additional considerations have already been addressed by policy reviews. Some of these policy reviews predated the raising of these issues. Others were already ongoing or timetabled for revision.

Reflecting on the totality of this review, it is noteworthy that the broader sum of issues identified within the report have already been picked up and therefore it would appear that this review is consistent with and reflective of others.

Report compiled by

Dr Chris Deighan, Deputy Medical Director (Corporate), GG&C

Appendix B

Interview with Dr T Inkster

Dr Inkster had raised 3 areas of concern in her letter of resignation to Dr J Armstrong. These were

1. SCI process
2. Duty of Candour regarding Infection control incidents
3. Governance relating to specialist groups reporting to IMTs

Dr T Inkster(TI) was interviewed to get fuller accounts of these issues on the 6th of January 2020 by Dr R Green and Mr R Gardiner. These are summary notes of these three topics.

SCI Process

This relates entirely to Hospital Acquired Cryptococcus. As part of the Duty of Candour arrangements, TI and the Consultant Haematologist spoke with the patient in January 2019 and also to [redacted] daughters to describe this unusual infection which had infected [redacted]. A child also became infected with the same organism at a later stage and both of these were therefore asked to be the subject of an SCI process beginning in April 2019 at an IMT that had been chaired by TI.

Subsequently the risk manager shared the draft of the Adult SCi with TI on 7th of June which TI input her extensive changes and returned on the 12th of June. Two further versions were shared with TI by the Haematology CSM in August, these had been significantly changed by two others (M McGuire and E Burt). TI had been asked which of the two versions she had agreed. She had agreed neither. TI is unaware of whether these have been shared with the family but is concerned that matters of fact had been removed from the document.

TIs concerns were that non experts had intervened and removed what was thought to be correct detail without her being asked to agree it and this had changed the whole sense of the document. Document control had been poor. Having asked for the SCI she has not seen a final version of the SCI which was to be shared with the patients and families and nor does she know if it has been sent.

TI had not experienced these interventions before during an SCI process.

Duty of Candour Incident

In 2018 an immune-compromised child became infected with an atypical mycobacterium likely from water. It was reported as an unusual organism to HPS and from there to SG as per standard process. They didn't test the water at that time as control measures ie filtration had subsequently been put in place. 18 months later a second child became infected and so an IMT was called. This was found to have come from water in theatres which had not been filtered. TI was to perform DoC with both families to alert to this finding. However when telling the first patients [redacted] , she and the GM for the area were stopped as they were told a letter was going from the Chairman to this parent as a number of other issues had been raised. TI then met with the [redacted] about other issues and it

became apparent that he had not been told about this and so felt that telling the truth about the investigation and findings was the only course to be taken. She was told by the Lead Nurse for Infection control that she was not to tell the [redacted] this detail. At this point TI felt that she needed to take advice from the GMC who advised her to whistle blow out with the organisation which she did to Fiona McQueen in SG.

TI concerned that obligations to tell the truth and communicate freely with parents and patients is being undermined

Governance of external meetings feeding into IMTs

An IMT in June 2019 asked for increased Chlorine Dioxide to be added to the water as the control measure for the atypical Mycobacterium. The Estates department did not take this forward but asked for External advice (from an expert on Legionella) who said this was not required. This message was not brought back to the IMT who had asked for it. The water technical group has made decisions where these were not minuted nor discussed at IMT. TI was asked not to sit on any of the specialist groups as she was apparently influencing the outcomes from these groups.

Although not in her letter of resignation TI expressed concern on who was giving IC advice as recent press statements were factually incorrect.

Summary

I believe TI has mentioned all of these issues to Linda De Castaeker in a whistleblowing investigation.

There are certainly some concerning comments regarding the changing of reports without consent of those who are giving professional opinion and also the overturning of decisions out with governance processes. It is also concerning that she may have been asked to withhold the truth to families and patients.

This is obviously only one side of the story and others would need to be interviewed to get a balanced view on these and perhaps this will come out in the other many processes that are currently ongoing. I would recommend that when IC becomes part of the Diagnostics Directorate a strong independent governance process of IMT/ICT is implemented and audited.

ON5-342	Ensuite	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-344	Isolation Bedroom	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-343	Ensuite	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-345	Isolation Bedroom	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-346	Ensuite	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-311	Isolation Bedroom	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-312	Ensuite	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-310	Isolation Bedroom	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-309	Ensuite	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-307	Isolation Bedroom	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-308	Ensuite	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-306	Isolation Bedroom	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
ON5-305	Ensuite	Superheating	HEPA Filtered EU12	No - Full Air Conditioning	Subject to Clinician confirmation on water heating
					All other rooms in Ward 5 are suitable for Chilled Beam - subject to confirmation of use in other oncology departments
					All other support accommodation on Level 3 is suitable for Chilled Beam installation
4	**Bone Marrow Transplant**				
1 BMT-419	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-420	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
2 BMT-422	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-421	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
3 BMT-423	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-424	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
4 BMT-426	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-425	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
5 BMT-427	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-428	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
6 BMT-409	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-410	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
7 BMT-412	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-411	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
8 BMT-413	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-414	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
9 BMT-416	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-415	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
10 BMT-417	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-418	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-439	Kitchen	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-403	Assisted Bathroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
BMT-407	Treatment Room	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
	HDU				
1 HDU-412	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
HDU-411	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
2 HDU-413	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
HDU-415	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
3 HDU-416	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
HDU-414	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
4 HDU-417	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	
HDU-418	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning	

5	HDU-419	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-420	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
6	HDU-425	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-424	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
7	HDU-426	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-427	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
8	HDU-409	2 Bed Rooms	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-410	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
9	HDU-422	2 Bed Rooms	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-423	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-434	Pantry	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-436	Assisted Bathroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HDU-406	Treatment Room	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
		Haemato-oncology Ward			
1	HEA-415	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-414	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
2	HEA-412	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-413	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
3	HEA-416	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-417	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
4	HEA-419	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-418	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
5	HEA-420	Isolation Bedroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-421	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
6	HEA-426	2 Bed Rooms	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-424	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-433	Adolescent Kitchen	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
7	HEA-431	4 Bed Room	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-432	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
8	HEA-430	4 Bed Room	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-428	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
9	HEA-430a	4 Bed Room	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-427	Ensuite	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-406	Pantry	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning
	HEA-407	Assisted Bathroom	Instantaneous Heat Supply	HEPA Filtered EU12	No - Full Air Conditioning

Inspection Panels for Instantaneous water heaters must be inspectable from outside the shower.

All Ward Accommodation for Haemato-oncology, BMT & HDU is to have HEPA filtered air to EU12
All other support accommodation on Level 4 is suitable for Chilled Beam installation

Other office accommodation outwith ward areas is suitable for Chilled Beam

BLAISDON

PLANS.

63

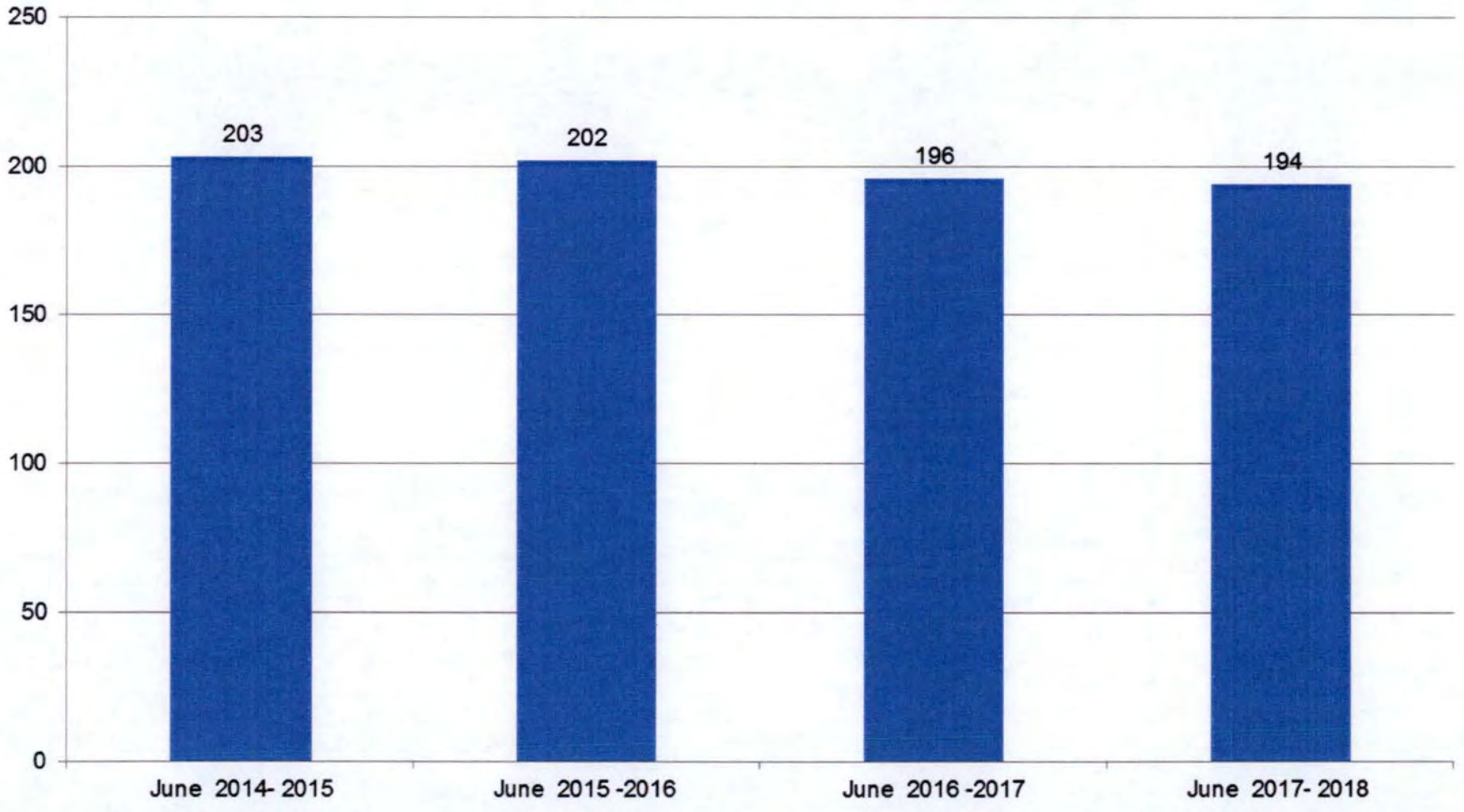
Bacteraemia rates and Resistance Paediatric Haemat –oncology 2014 -2018

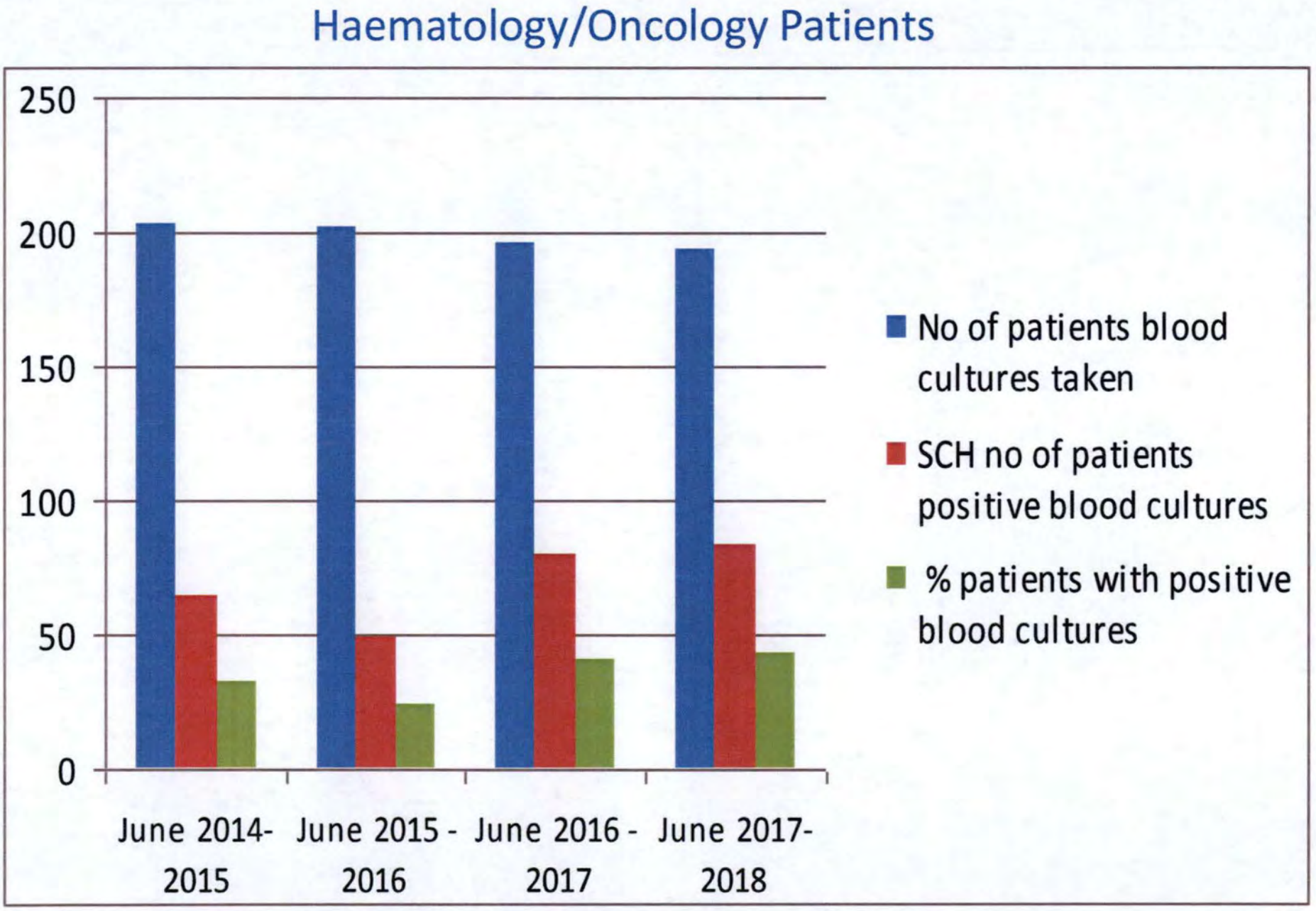
Dr Christine Peters

Kathleen Harveywoods

Haematology/Oncology Patients

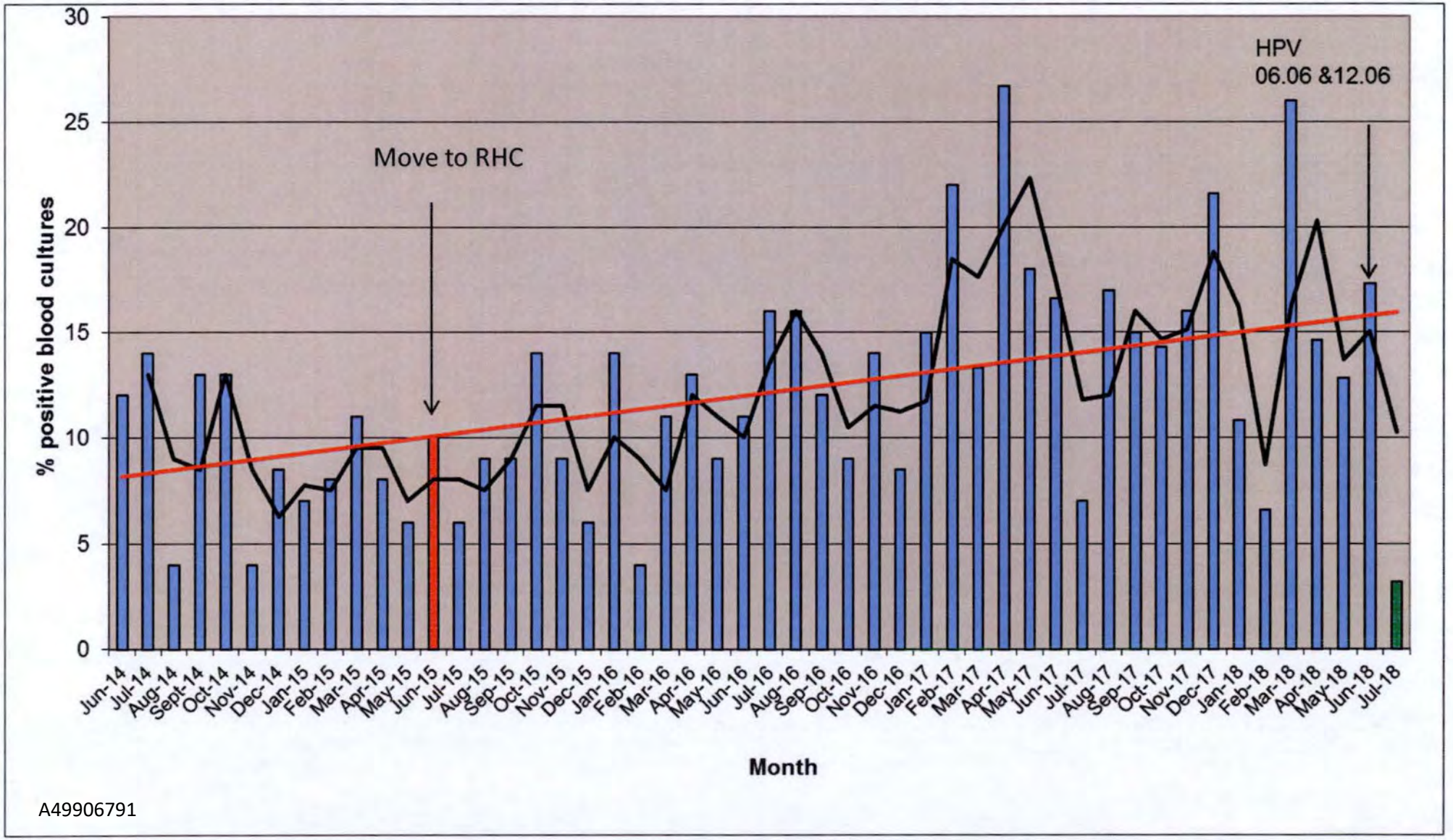
Number of blood cultures taken/ year




Haematology/Oncology Patients
250
200
150
100
50
0
June 2014-2015
June 2015 - 2016
June 2016 - 2017
June 2017-2018
No of patients blood cultures taken
SCH no of patients positive blood cultures
% patients with positive blood cultures

Haematology/Oncology Patients

% positive blood cultures by month June 2014 – **July** 2018



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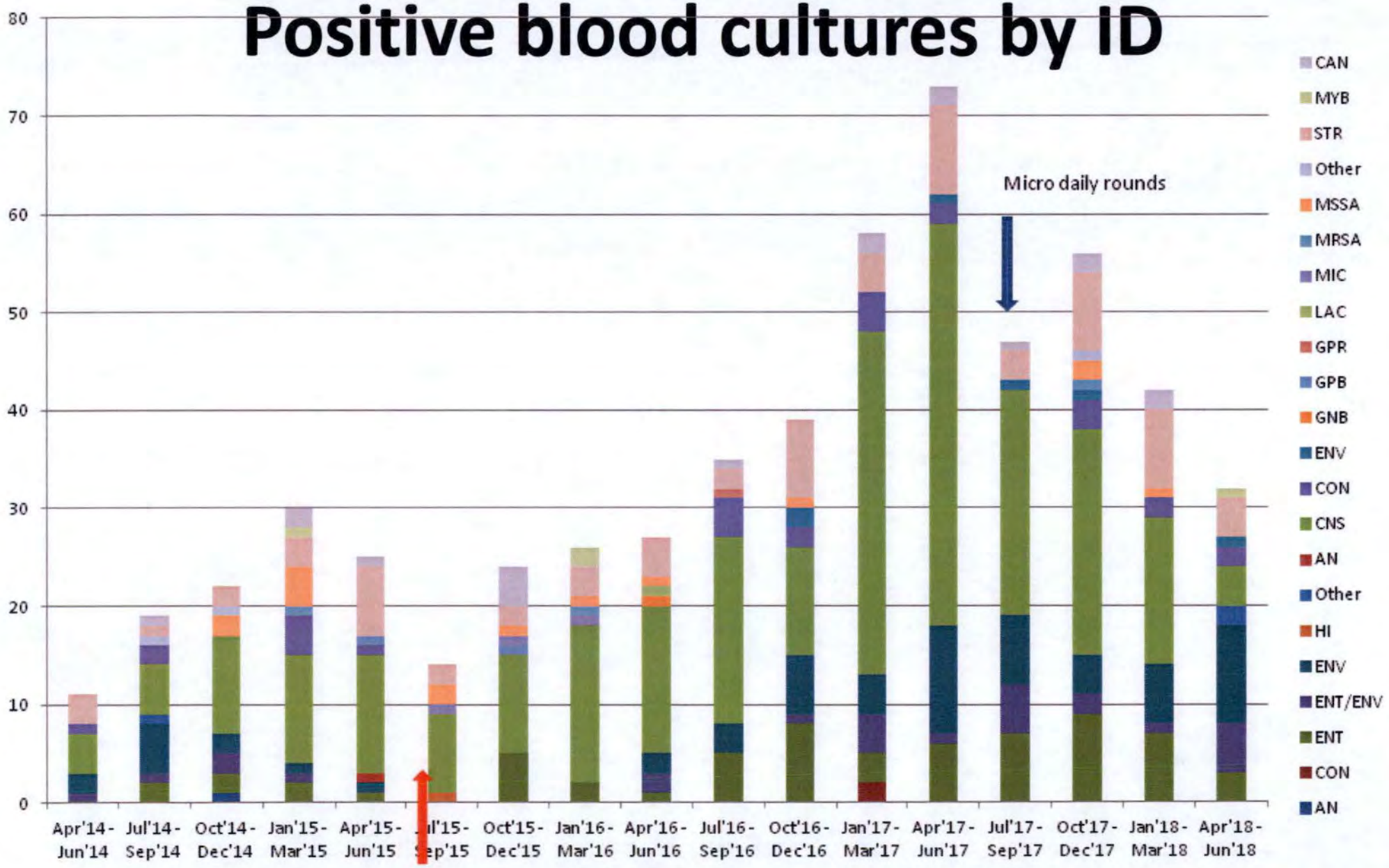
Quarterly De- duplicated Total Positive blood cultures by ID



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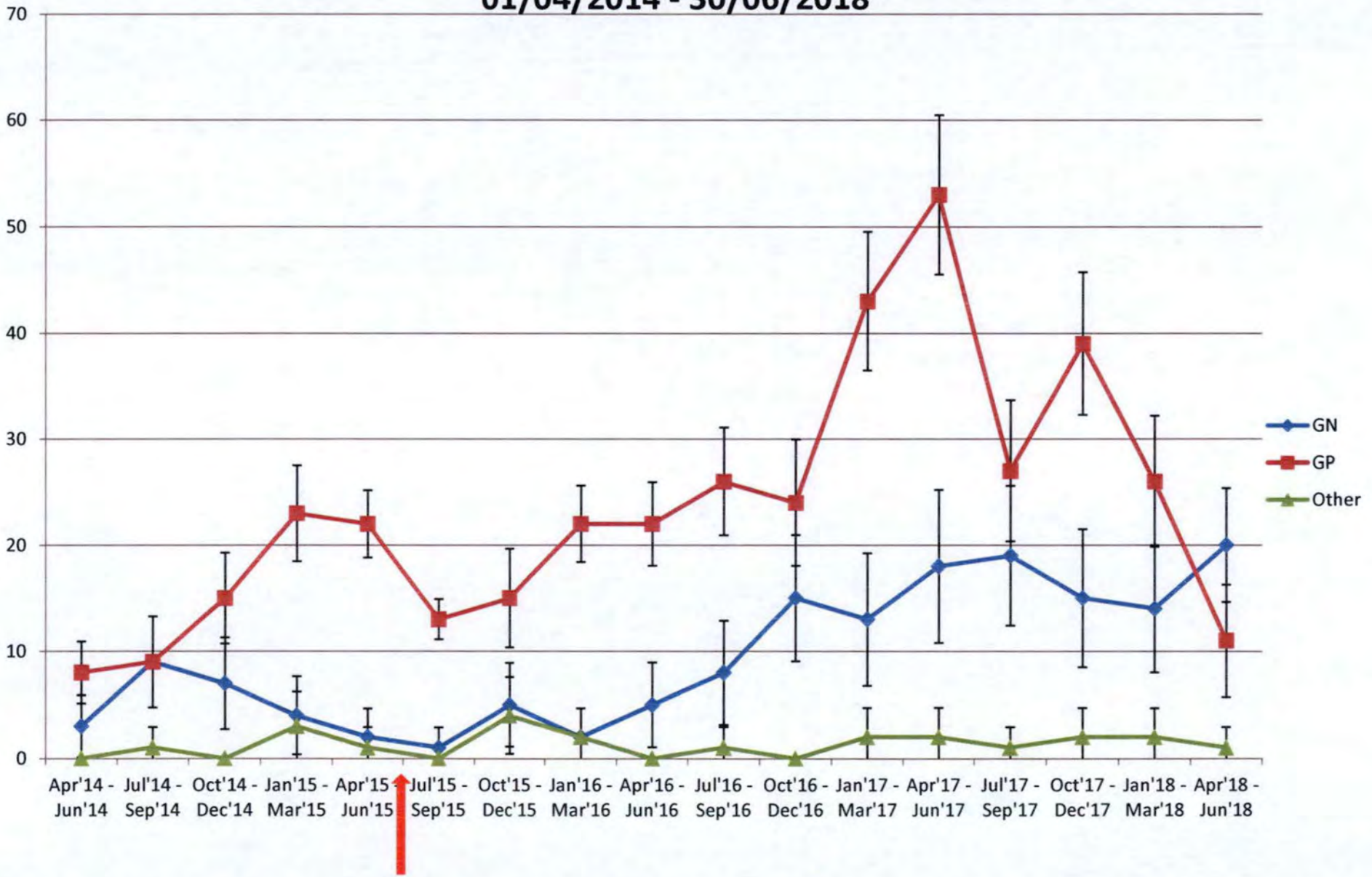
Positive Blood Cultures Gram Negative and Gram Positive
01/04/2014 - 30/06/2018



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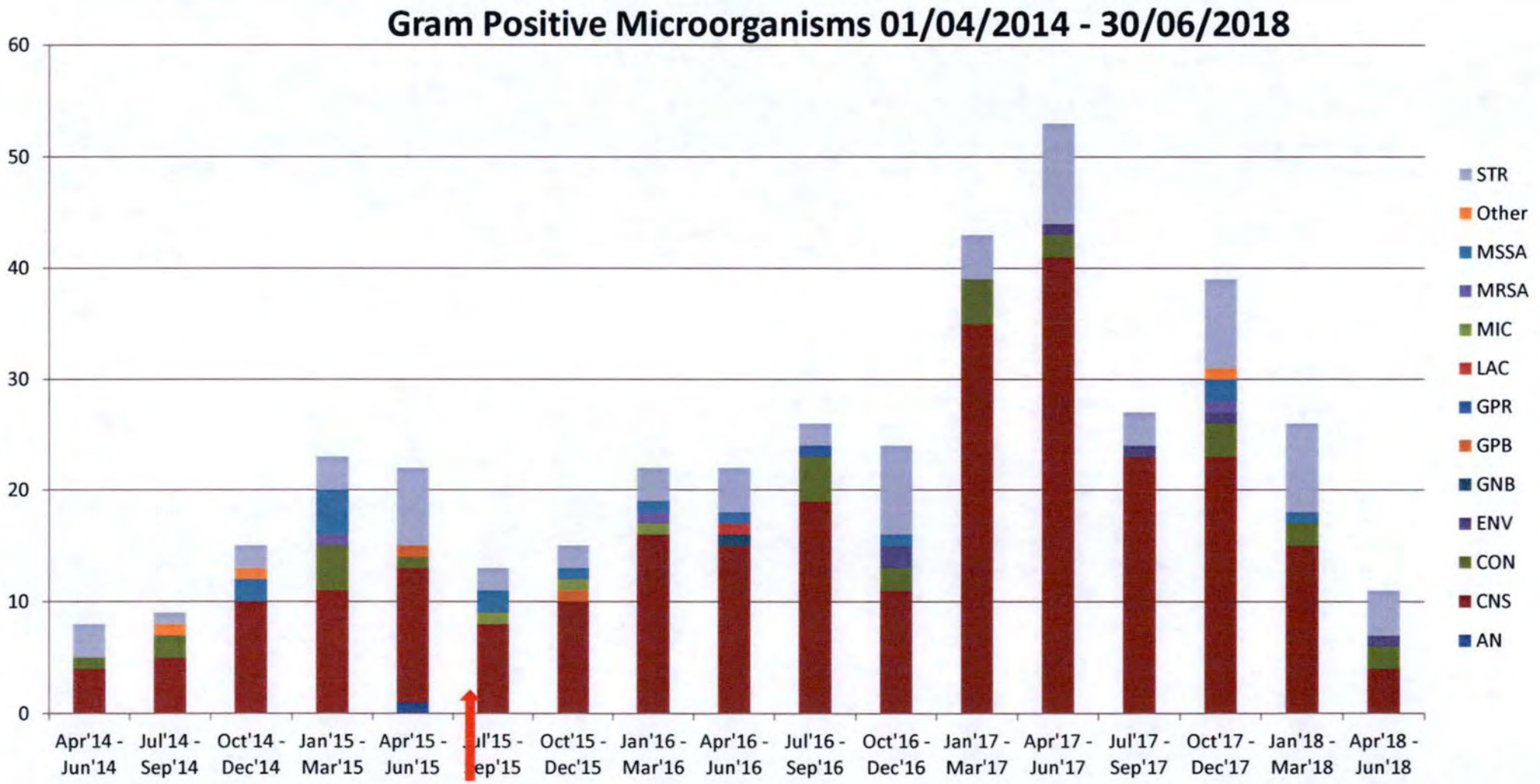
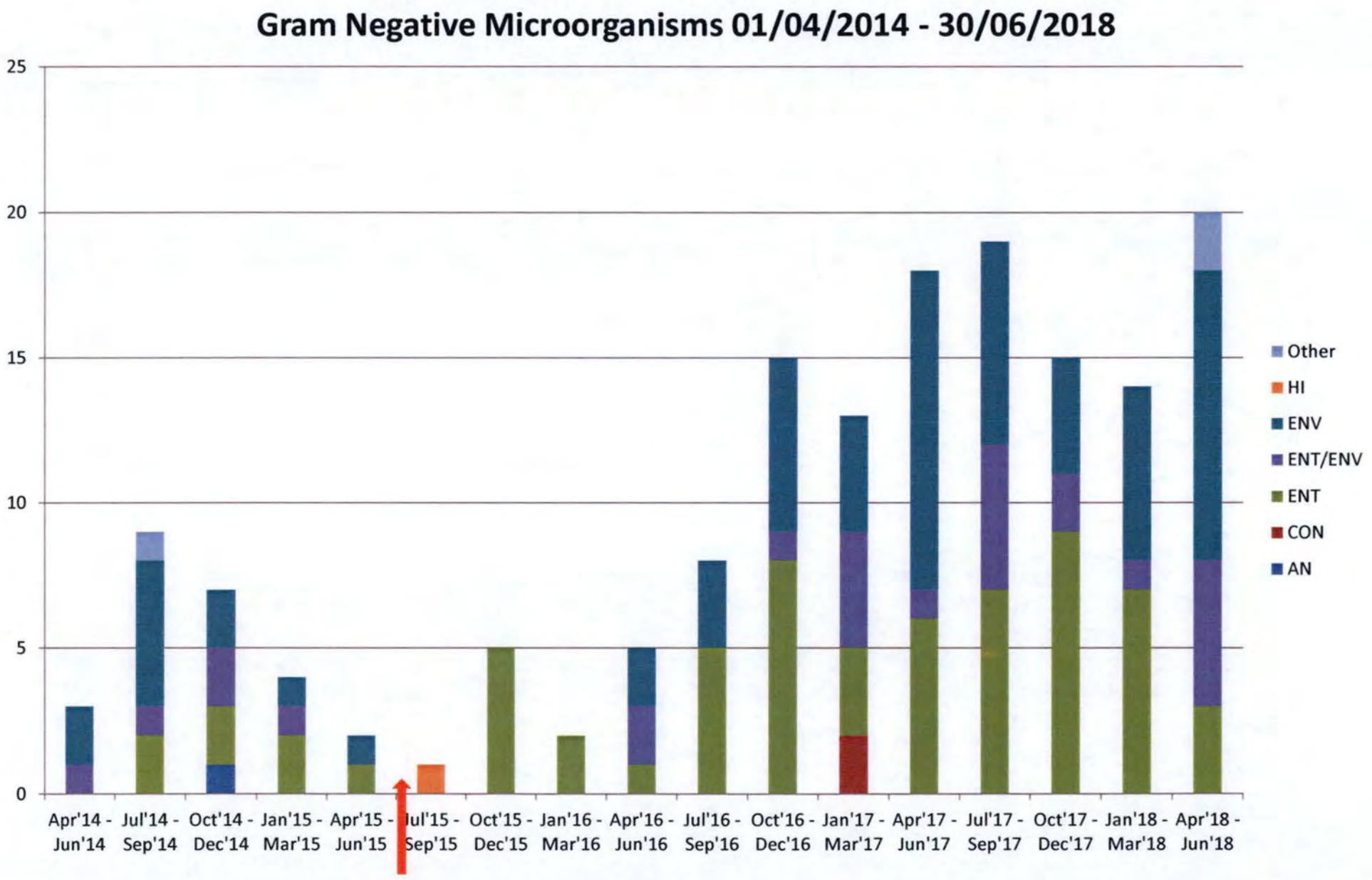
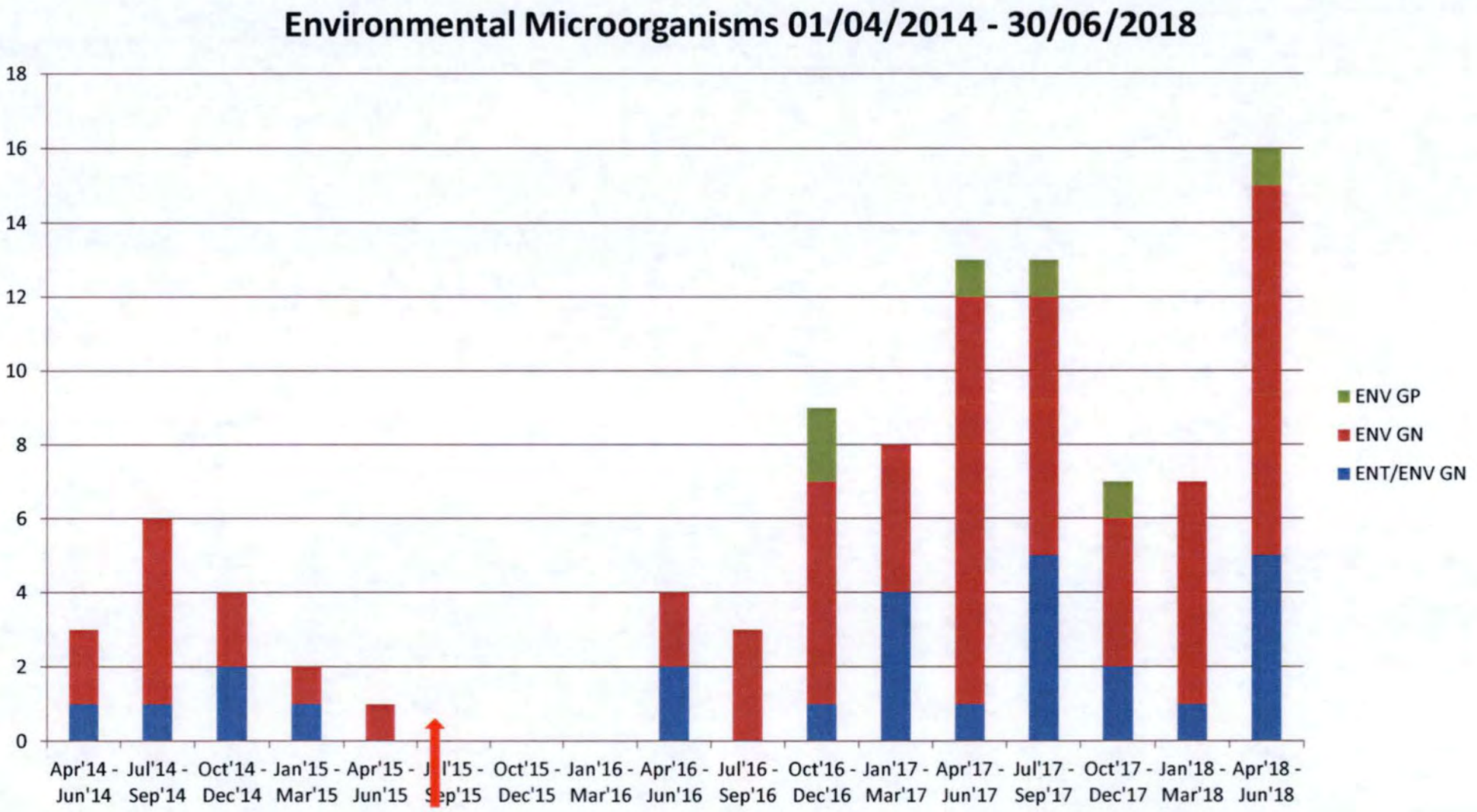

Gram Positive Microorganisms 01/04/2014 - 30/06/2018
60
50
40
30
20
10
0
Apr'14 - Jun'14
Jul'14 - Sep'14
Oct'14 - Dec'14
Jan'15 - Mar'15
Apr'15 - Jun'15
Jul'15 - Sep'15
Oct'15 - Dec'15
Jan'16 - Mar'16
Apr'16 - Jun'16
Jul'16 - Sep'16
Oct'16 - Dec'16
Jan'17 - Mar'17
Apr'17 - Jun'17
Jul'17 - Sep'17
Oct'17 - Dec'17
Jan'18 - Mar'18
Apr'18 - Jun'18
STR
Other
MSSA
MRSA
MIC
LAC
GPR
GPB
GNB
ENV
CON
CNS
AN

A49906791


Gram Negative Microorganisms 01/04/2014 - 30/06/2018
25
20
15
10
5
0
Apr'14 - Jun'14
Jul'14 - Sep'14
Oct'14 - Dec'14
Jan'15 - Mar'15
Apr'15 - Jun'15
Jul'15 - Sep'15
Oct'15 - Dec'15
Jan'16 - Mar'16
Apr'16 - Jun'16
Jul'16 - Sep'16
Oct'16 - Dec'16
Jan'17 - Mar'17
Apr'17 - Jun'17
Jul'17 - Sep'17
Oct'17 - Dec'17
Jan'18 - Mar'18
Apr'18 - Jun'18
Other
HI
ENV
ENT/ENV
ENT
CON
AN

A49906791


Environmental Microorganisms 01/04/2014 - 30/06/2018
18
16
14
12
10
8
6
4
2
0
Apr'14 - Jun'14
Jul'14 - Sep'14
Oct'14 - Dec'14
Jan'15 - Mar'15
Apr'15 - Jun'15
Jul'15 - Sep'15
Oct'15 - Dec'15
Jan'16 - Mar'16
Apr'16 - Jun'16
Jul'16 - Sep'16
Oct'16 - Dec'16
Jan'17 - Mar'17
Apr'17 - Jun'17
Jul'17 - Sep'17
Oct'17 - Dec'17
Jan'18 - Mar'18
Apr'18 - Jun'18
ENV GP
ENV GN
ENT/ENV GN

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Yearly list of environmental organisms

- Acin. ursingii
- Acin.baumannii compl
- Burk. cepacia
- Burk. cepacia group
- Chr. indologenes
- Eliz. meningoseptica
- Eliz. meningoseptica
- Ent. cloacae
- Ent. cloacae/cloacae
- Ent. cloacae/cloacae
- Pantoea spp.
- Ps. aeruginosa
- Pseudomonas spp
- Ser. marcescens
- Steno maltophilia
- Steno maltophilia

Aer. hydroph/caviae

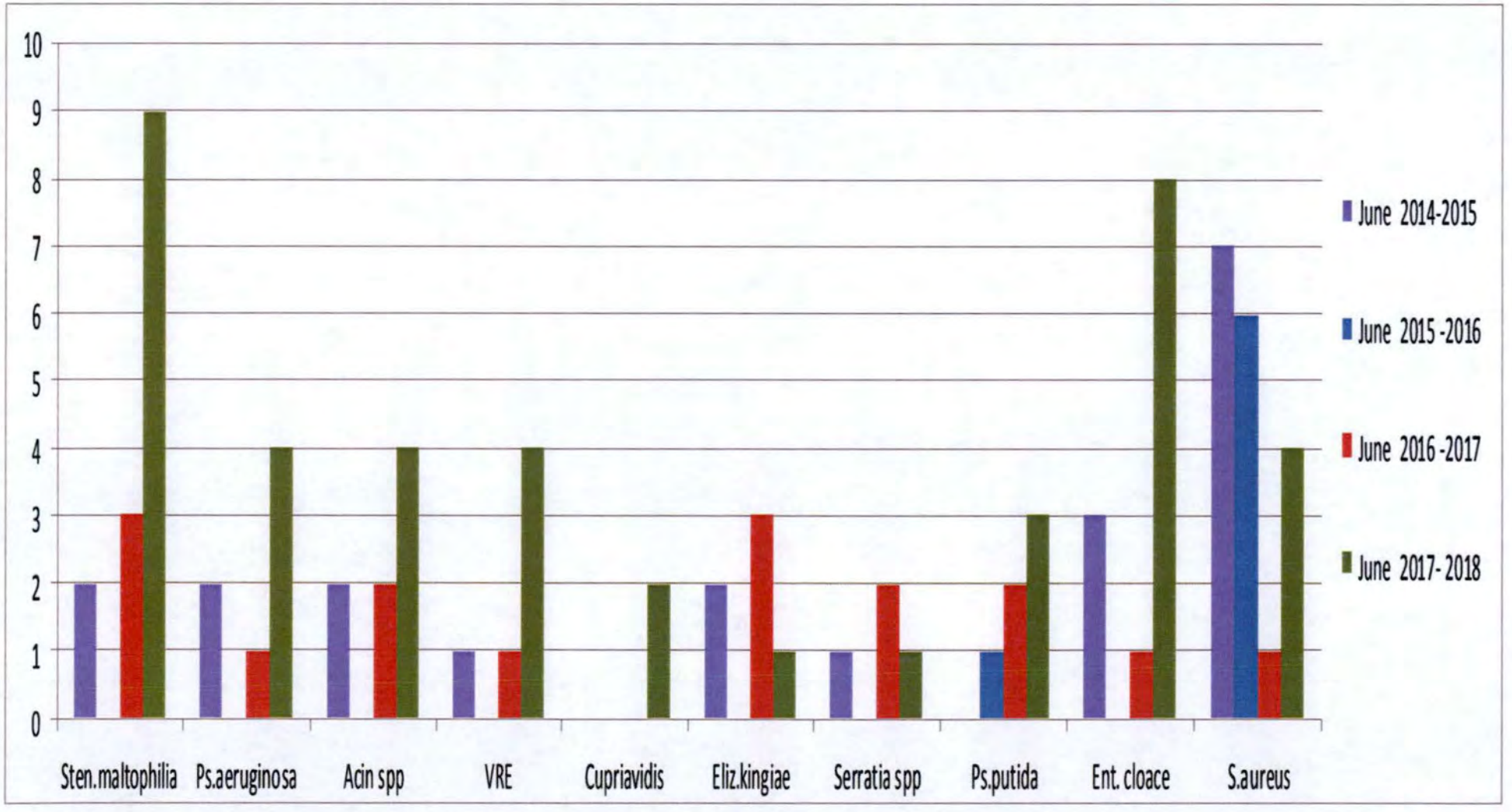
Aci. baumannii
Aci. baumannii
Acin. ursingii
Acin. ursingii
Brev. species
Chr. indologenes
Chr. indologenes
Cit. freundii
Cit. Youngae
Del. acidovorans
Derm. nishinomiyaens
Derm. nishinomiyaens
Eliz. meningoseptica
Eliz. meningoseptica
Eliz. meningoseptica
Ent. cloacae/cloacae
Ent. cloacae/cloacae
Herbaspirillum sp
Paen. durus
Pantoea spp.
Ps. aeruginosa
Ps. putida
Ps. putida
Rhiz. radiobacter
Ser. marcescens
Ser. marcescens
Ser. marcescens
Sph. paucimobil.
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia

Acin. ursingii
Acin. ursingii
Acin.baumannii compl
Acin.baumannii compl
Chryseob. spp
Cit. Braakii
Cup. pauculus
Cup. pauculus
Del. acidovorans
Derm. nishinomiyaens
Eliz. species
Ent. cloacae
Ent. cloacae
Ent. cloacae
Ent. cloacae/cloacae
Ent. cloacae/cloacae
Ent. cloacae/cloacae
Ent. cloacae/cloacae
Ent. cloacae/cloacae
Ent. cloacae/cloacae
Ent. cloacae/cloacae
Ent. horm
Koc. rhizophila
Paen. pabuli
Pantoea spp.
Ps. aeruginosa
Ps. aeruginosa
Ps. aeruginosa
Ps. aeruginosa
Ps. aeruginosa
Ps. putida
Ps. putida
Ps. stutzeri
Rao. planticola
Ros. mucosa
Ser. liquefac.
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia
Steno maltophilia

Haematology/Oncology Patient

No of patients/ year

Environmental Gram Negative organisms compared with S.aureus (SAB) and VRE



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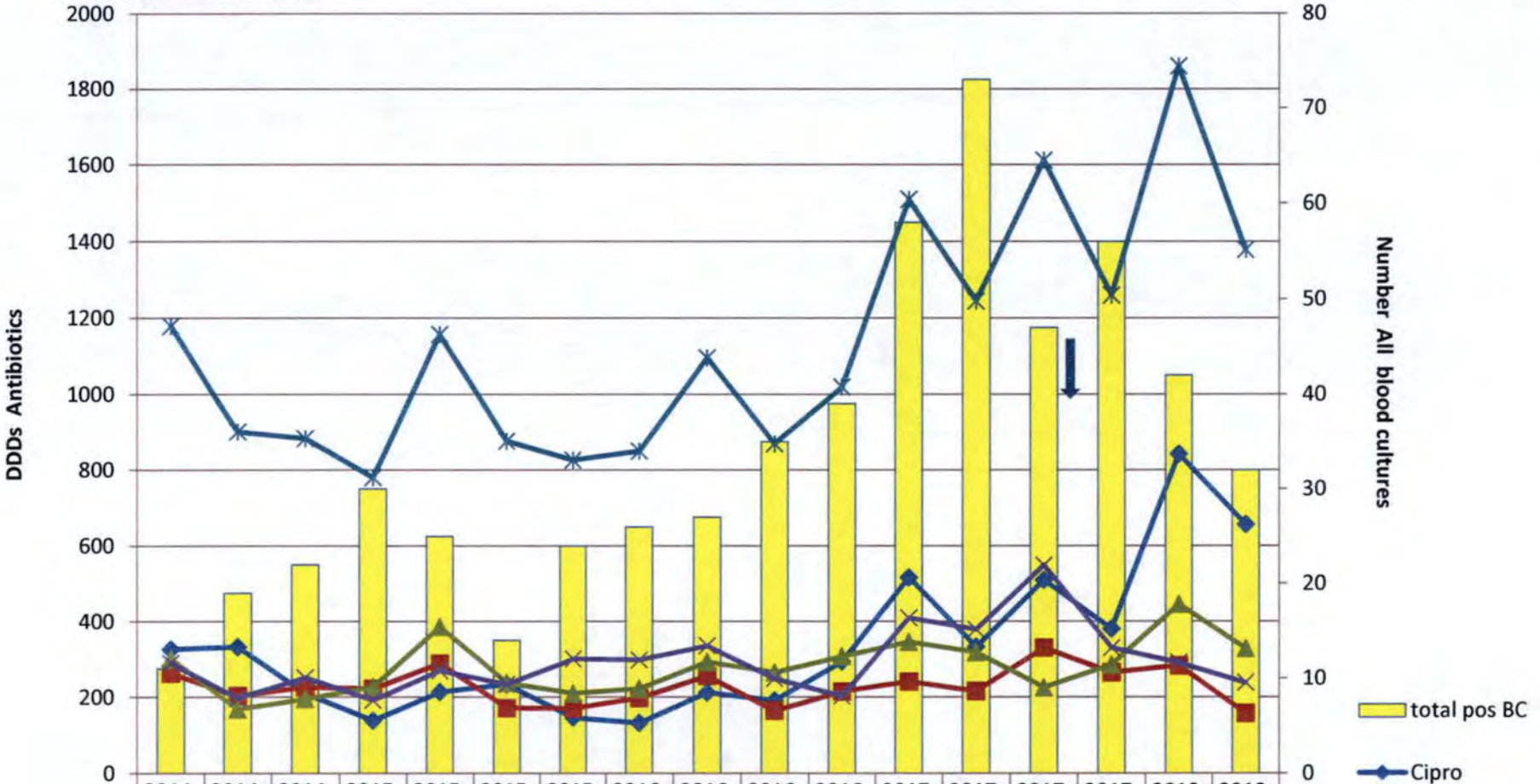
Conclusions

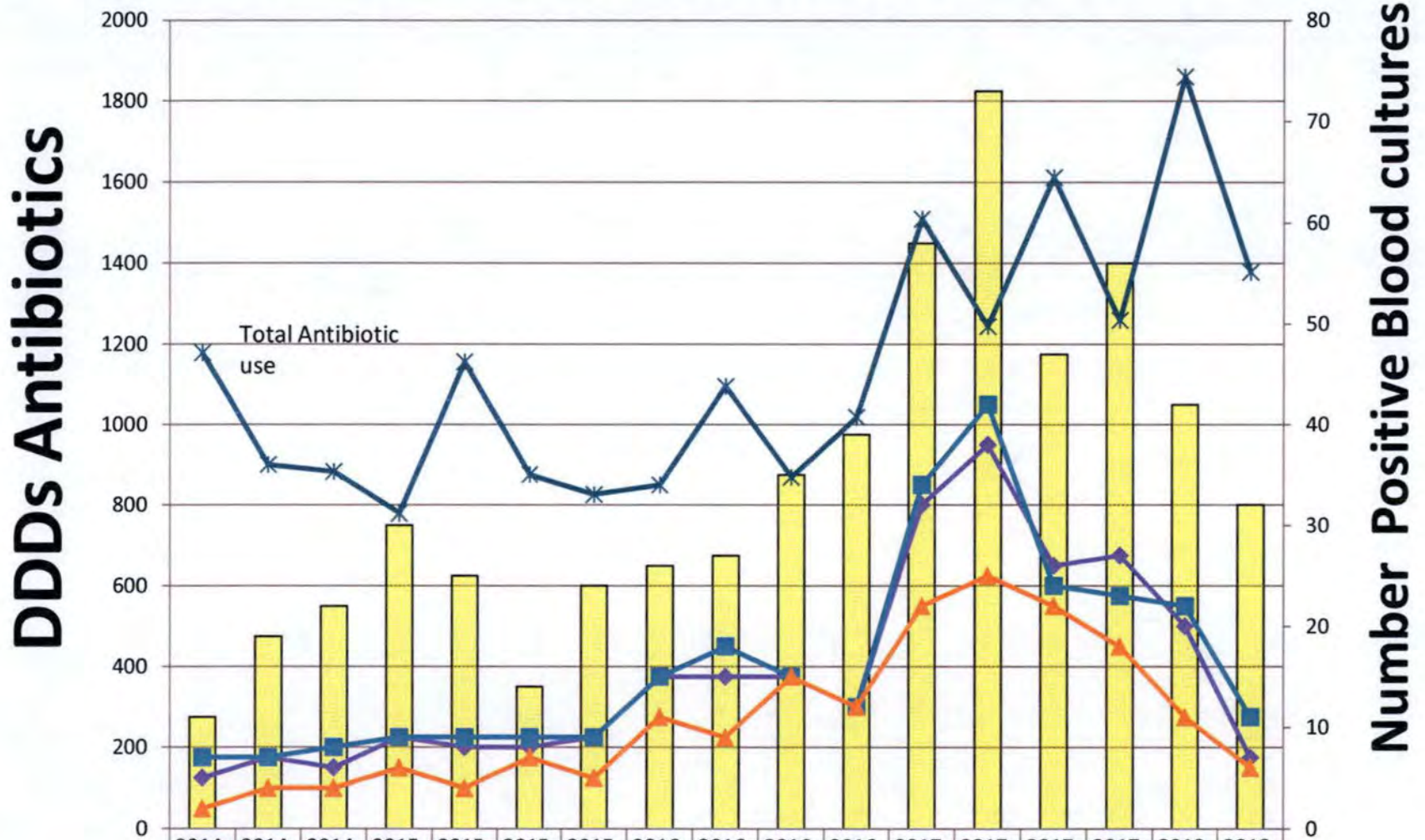
- Significant increases in bacteraemia rates with a peak in April –June 2017
- Reduction in Gram positives since 2017
- Double peak in environmental organisms in third quarter 2017 and second quarter 2018
- Change in predominance from gram positive to gram negative organisms, with more gram negatives for first time in second quarter 2018

Antibiotic use

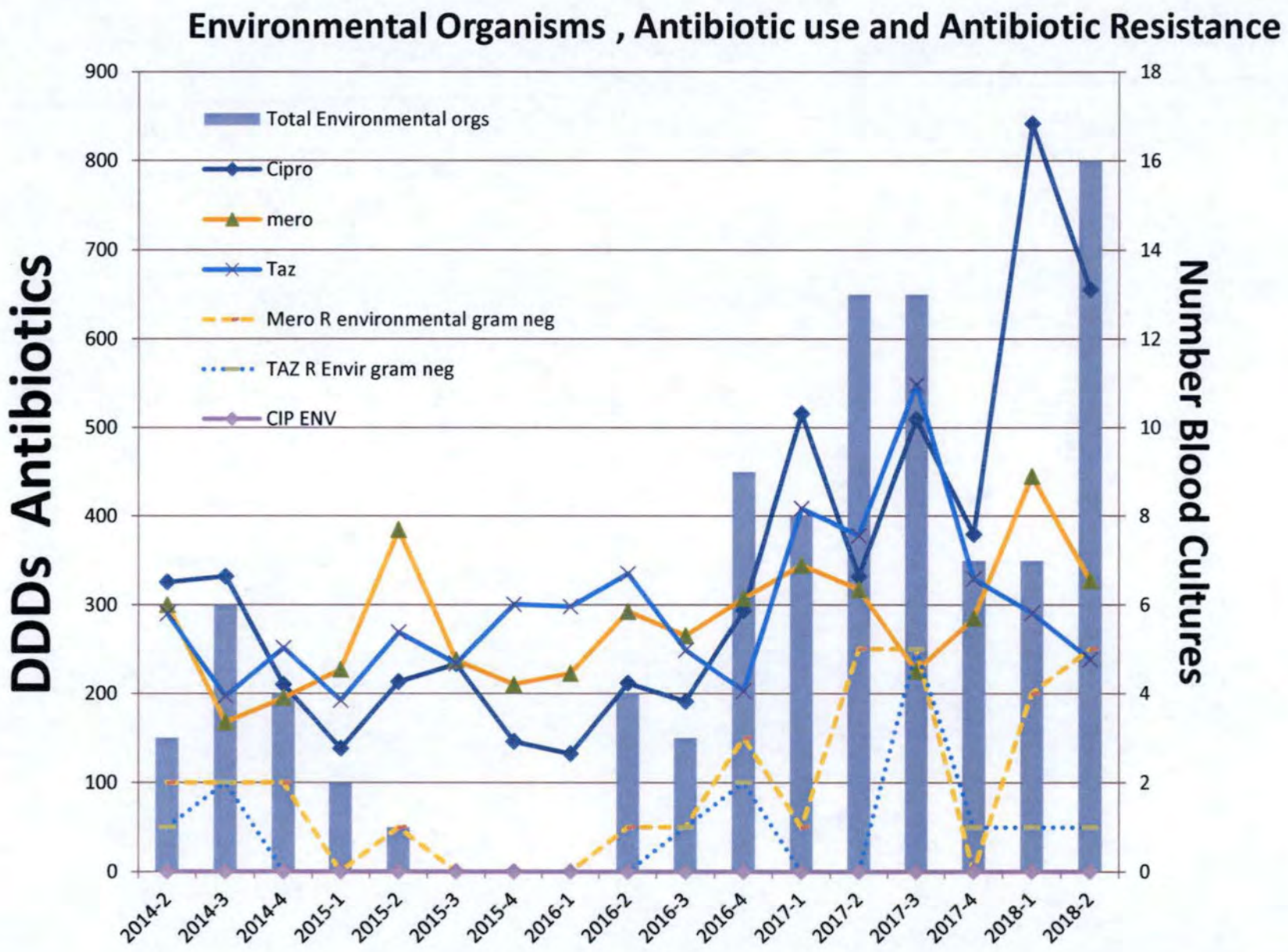


	2014-2	2014-3	2014-4	2015-1	2015-2	2015-3	2015-4	2016-1	2016-2	2016-3	2016-4	2017-1	2017-2	2017-3	2017-4	2018-1	2018-2
total pos BC	11	19	22	30	25	14	24	26	27	35	39	58	73	47	56	42	32
Cipro	325.8	332.3	210	138	213.2	233.4	145.8	132.2	211.6	191	293.6	515.4	332.2	509	379.8	841.6	655.6
Gent	262.5	203.3	226.3	222.5	288.8	171.3	169.6	197.1	255.4	164.2	214.6	240.4	215.4	329.6	264.6	282.5	157.1
mero	300	167.5	195	227	385	237.5	210	222.5	292.5	265	307.5	345	317.5	225	285	445	327.5
Taz	290	197.1	251.4	192.1	269.1	233.7	300.6	298	335.4	248.9	202.8	408.6	378.6	548.3	329.6	290.7	238.3
Total	1178	900.3	882.7	779.6	1156	875.9	826	849.8	1095	869	1018	1509	1244	1612	1259	1860	1378

Total Blood Cultures , total resistant, total antibiotic use

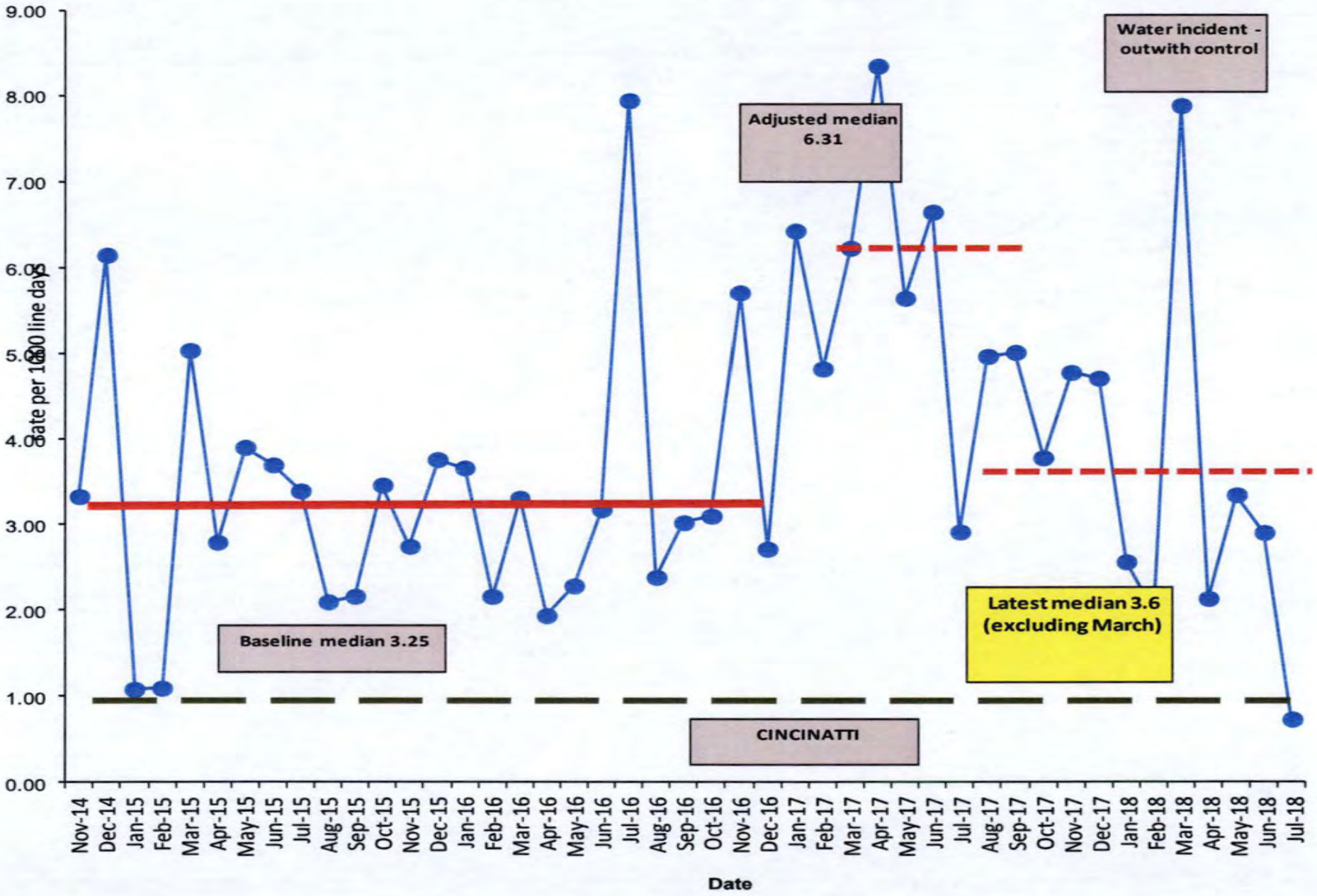


	2014-2	2014-3	2014-4	2015-1	2015-2	2015-3	2015-4	2016-1	2016-2	2016-3	2016-4	2017-1	2017-2	2017-3	2017-4	2018-1	2018-2
total pos BC	11	19	22	30	25	14	24	26	27	35	39	58	73	47	56	42	32
Total	1178.3	900.27	882.68	779.64	1156.1	875.86	825.95	849.78	1094.9	869.02	1018.4	1509.4	1243.7	1611.8	1259	1859.8	1378.5
All taz resisatance	5	7	6	9	8	8	9	15	15	15	12	32	38	26	27	20	7
All mero res	7	7	8	9	9	9	9	15	18	15	12	34	42	24	23	22	11
All cipro reistant	2	4	4	6	4	7	5	11	9	15	12	22	25	22	18	11	6


Environmental Organisms , Antibiotic use and Antibiotic Resistance
DDDs Antibiotics
Number Blood Cultures
Total Environmental orgs
Cipro
mero
Taz
Mero R environmental gram neg
TAZ R Envir gram neg
CIP ENV
900
800
700
600
500
400
300
200
100
0
18
16
14
12
10
8
6
4
2
0
2014-2
2014-3
2014-4
2015-1
2015-2
2015-3
2015-4
2016-1
2016-2
2016-3
2016-4
2017-1
2017-2
2017-3
2017-4
2018-1
2018-2

Rate of central line associated blood stream infections (CLABSI) per 1000 central line days

(Updated to 31 July 2018) - QI Group Data



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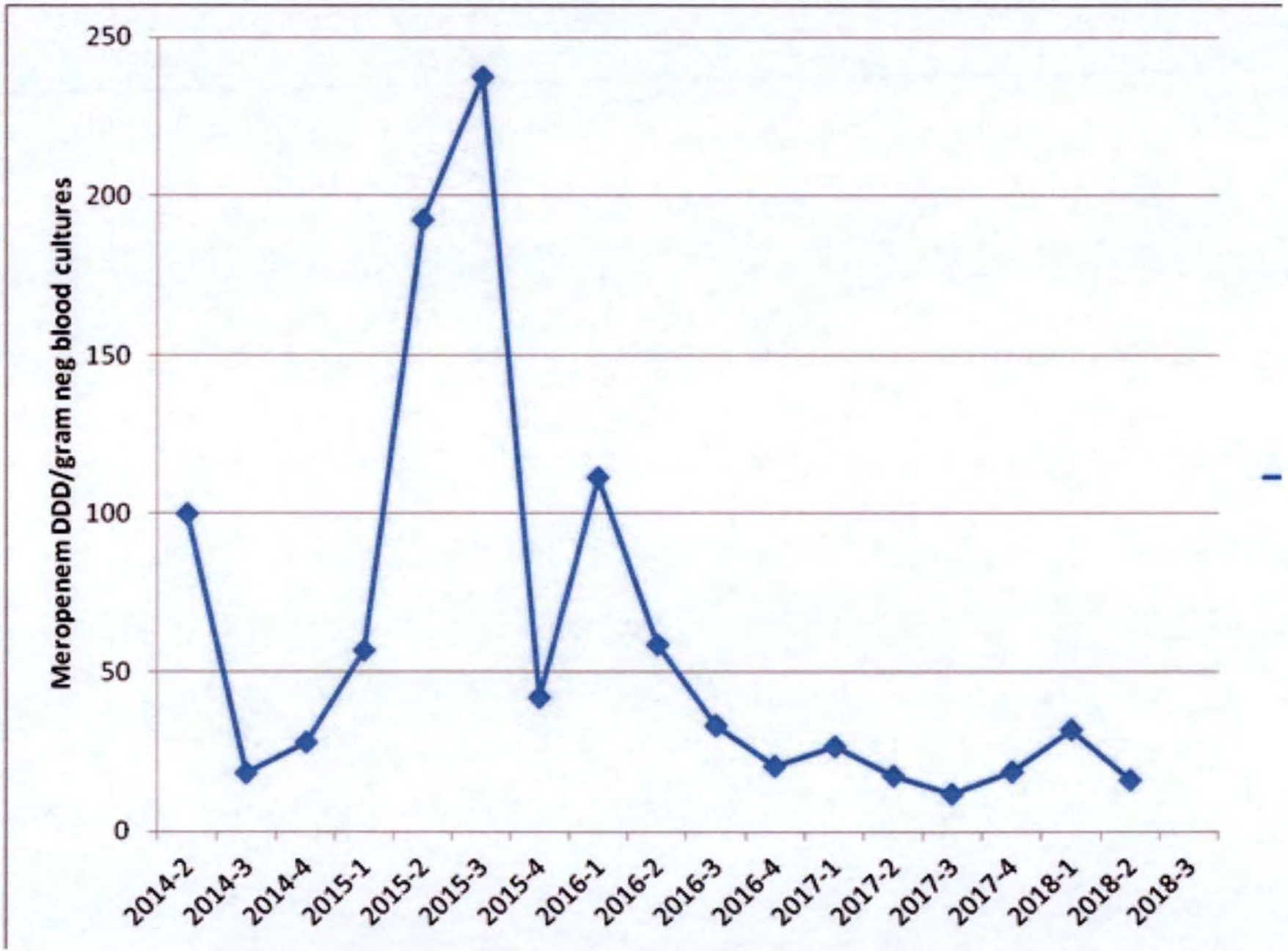
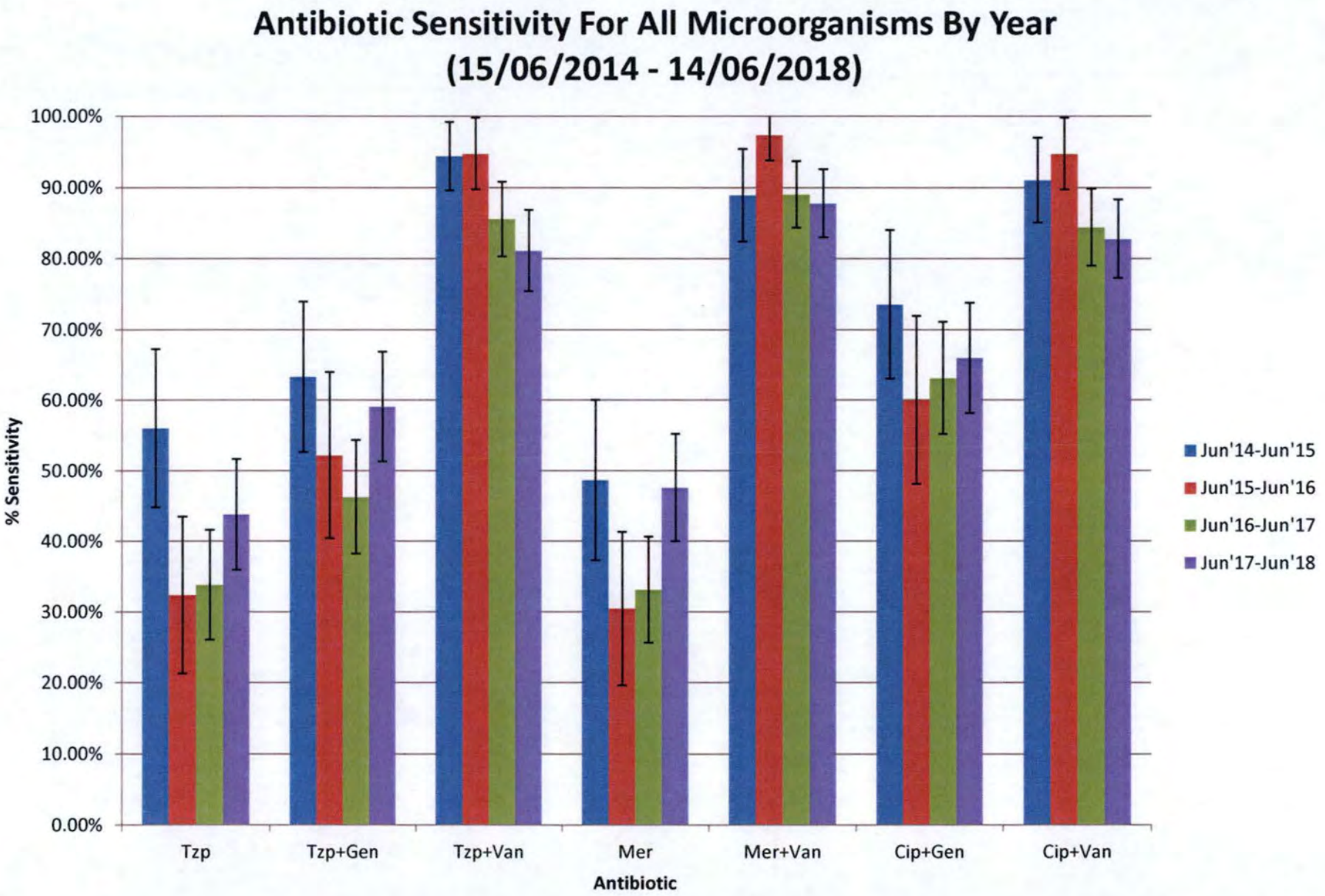
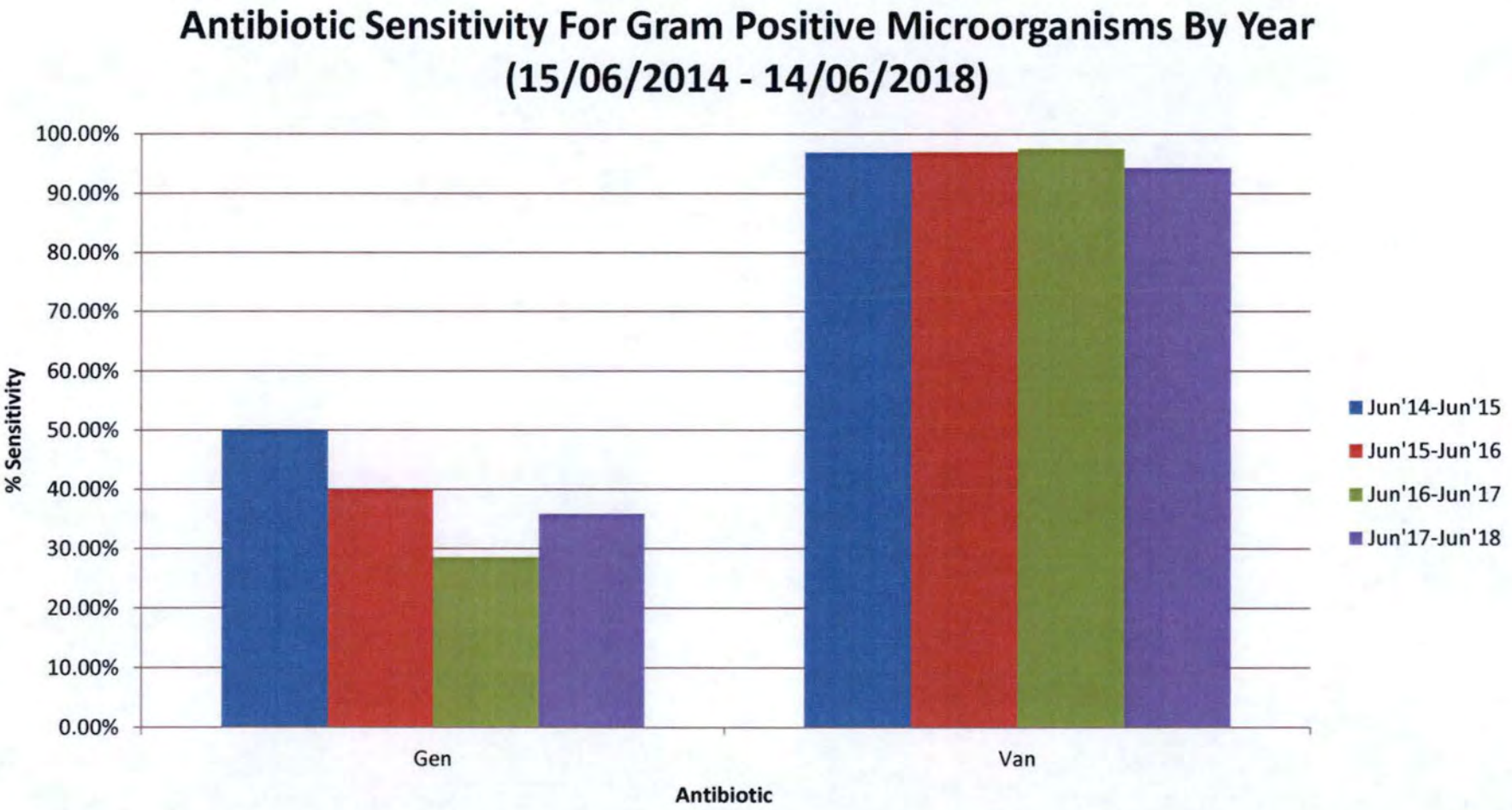

Meropenem DDD/gram neg blood cultures
250
200
150
100
50
0
2014-2
2014-3
2014-4
2015-1
2015-2
2015-3
2015-4
2016-1
2016-2
2016-3
2016-4
2017-1
2017-2
2017-3
2017-4
2018-1
2018-2
2018-3

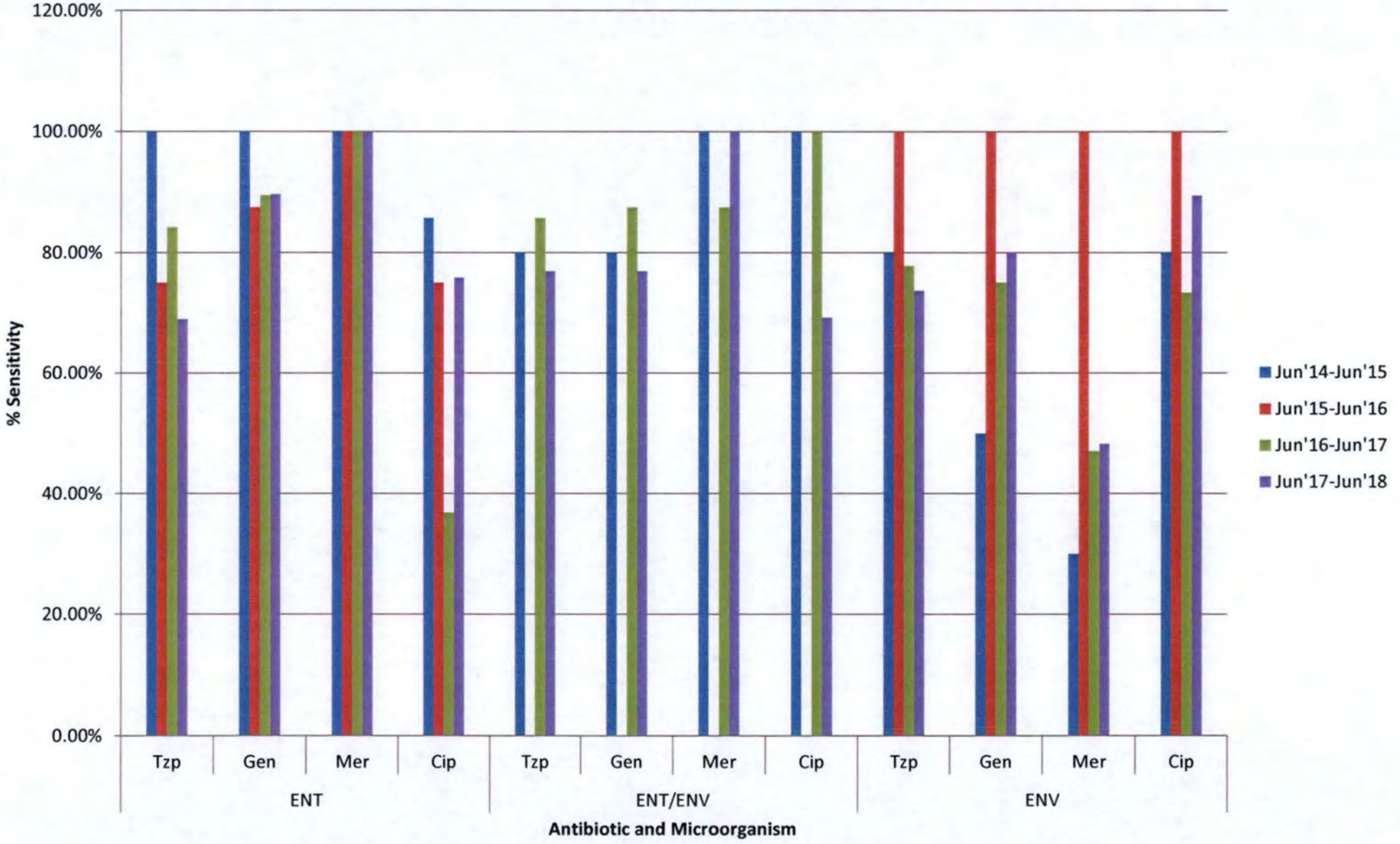
Conclusions

- Total antibiotic use peaks associated with increase in cipro use
- Peak in BCs associated with peak in resistance rates to taz and mero and cipro


Antibiotic Sensitivity For All Microorganisms By Year
(15/06/2014 - 14/06/2018)
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
% Sensitivity
Tzp
Tzp+Gen
Tzp+Van
Mer
Mer+Van
Cip+Gen
Cip+Van
Antibiotic
Jun'14-Jun'15
Jun'15-Jun'16
Jun'16-Jun'17
Jun'17-Jun'18


Antibiotic Sensitivity For Gram Positive Microorganisms By Year
(15/06/2014 - 14/06/2018)
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
% Sensitivity
Gen
Van
Antibiotic
Jun'14-Jun'15
Jun'15-Jun'16
Jun'16-Jun'17
Jun'17-Jun'18

Antibiotic Sensitivity For Gram Negative Microorganisms By Year (15/06/2014 - 14/06/2018)



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Coagulase negative staph

- 2015-18 – june 30th to june 30th
- 90 CoNS BSI
- 21/90 Teico R (23.3%)
- 1/90 Vanc R (Borderline MIC of 4. E-test = 2 R.L)

Conclusions

- Large variability in year to year resistance patterns
- When organism is unknown TAZ plus Vanc gives 80% cover , Gent plus taz less than 60%
- Gram negative marked differences in resistance environmental vs coliform
- Gram positives – vancomycin better cover till teic sens known.

(3)

Fact ⊛ Supported by 14 of 18 consultants spoken to each

⊛ Essential to speak to Teresa Imrster; Christine Peters; Pauline Wright

* other colleagues

evidence for BMT

NO CONFIDENCE IN IPC MX
IPC NOT FIT FOR PURPOSE

Precipitating factor = BMT unit

- what was spec?
- who signed it off?
- lack of commissioning data
  - * AIR TESTING
  - * Validation data signed off by whom? should be IPC

- Health Building Note 00-09 (2013)
- email advising air testing prior to paeds pts moving
- mixed paedo adult ward not fit for purpose

Role of John Hood:
- experience
- previous unit

Other IPC issues

Bullying
Undermining
Lack of communication
- no handover
- ICD meetings not minuted

Renal UPE - TI tears
PCP
CPE

Mycobacterium chimera
HPS/PHE briefing note in perfusion machines
⇒ "nothing to do with me"

Tom Walsh tried to delay decision in spite of pt. safety.
TI/CP asked to sign document with which they did not agree
Threatening email from TW re. responsibility (not aware!)

Final straw
⇓
⊛ 3 senior cons request urgent job plan reviews
⊛ No other consultants will work with CW
⊛ Grave reservations re. placing new consultants in this environment

- Does not seek expert advice & disregards
- does not communicate

John Coia
aerosol gen. procedures
- paper contravened H+S Act (HPS

Andrew Smith
endoscope decontamination

2013 - Cons body ⇒ Rachel/Isobel express concerns

RHSC computer system ignored advice

stress survey ←

→ undermining of senior technical staff
→ bullying
→ My style

⇓
damage to lab

DEANERY report
trainees
→ gap in postgrad training programme

CPA accredited lab
- SOPs changed 2 out consultation (daily)
= governance issue

lab within a lab (RHSC)

Invited to MDT did not attend
⇒ had to institute LICE
⇒ wedge driven between IPC & Microbiology
- governance

5 sessions min
- no attendance at meetings
- no engagement

10 consultants

Atmosphere of relentless bullying
Team destroyer
Bully & a toxic management style

not collaborative
not collegiate
unable to build consensus

SECTOR: South Glasgow **REPORT PREPARED BY: F. Gallagher** **DATE: 18/08/2017**

Any SPCs above the upper control limit at ward or site: NIL

Site	Ward	Sector	Specialty	Organism	Date Reported	Action / Update

Any SABs / severe cases of CDI meeting the criteria for Datix/Clinical Review: YES

Site	Ward	Sector	Speciality	Patient Initials	SAB / severe CDI CDI on part 1 or 2 D/C (please state which)	Specimen Date	HAI: Y/N - If YES Ward / Sector attributed to	Source if SAB	Datix
QEUH	53	South Glasgow	Care of the Elderly	[redacted]	CDI Death – Part 1 of death certificate	[redacted]/7/17	N	N/A	[redacted]

Any incidents / outbreaks requiring HIIAT assessment: NIL

Site	Ward	Sector	Specialty	Organism / Incident	HIIAT Score	HIIAT Date	Action / Update

Other Issues:

4B1 – Ceiling and ventilation works continue as planned. Patients from 4C haematology are now placed in 4B haematology. Patients previously in 4B1 are now placed in 4C – Frailty Unit.

39

NHS Greater Glasgow and Clyde	NHS GREATER GLASGOW & CLYDE CONTROL OF INFECTION COMMITTEE STANDARD OPERATING PROCEDURE (SOP)	Page	1 of 11
		Effective From	Feb 2020
	Patient Placement Guidance Interim	Review Date	Feb 2022
		Version	Version Draft 1.4
The most up-to-date version of this SOP can be viewed at the following website: www.nhsggc.org.uk/your-health/public-health/infection-prevention-and-control/			

SOP Objective

To ensure that patients are cared for in the appropriate area in order to minimise the risk of cross-infection, and to protect immune compromised patients from environmental infection.

This SOP applies to all staff employed by NHS Greater Glasgow & Clyde and locum staff on fixed term contracts and volunteer staff.

KEY CHANGES FROM THE PREVIOUS VERSION OF THIS SOP

- **This is a new SOP**

Document Control Summary

Approved by and date	This will be approved by Board Infection Control Committee NB this is currently interim guidance
Date of Publication	February 2020
Developed by	Infection Control Policy Sub-Group
Related Documents	National IPC Manual http://www.nipcm.hps.scot.nhs.uk/ MERS-cov-information hub https://www.hps.scot.nhs.uk/a-to-z-of-topics/middle-east-respiratory-syndrome-coronavirus/ 2019-nCoV https://www.hps.scot.nhs.uk/a-to-z-of-topics/wuhan-novel-coronavirus/
Distribution/ Availability	NHSGGC Infection Prevention and Control Internet www.nhsggc.org.uk/your-health/public-health/infection-prevention-and-control/
Lead Manager	Board Infection Control Manager
Responsible Director	Director of Infection Prevention and Control

CONTENTS

1. Responsibilities 3
2. General Information on Specialist Ventilation 4
3. What is a Positive Pressure Ventilated Lobby (PPVL) Room 4
4. What is a Negatively Pressured Room 4
5. What is a BMT Room 4
6. Room Types 5
   - Table 1. Special Ventilation Rooms – Royal Hospital for Children (RHC) 7
   - Table 2. Special Ventilation Rooms – Adult Queen Elizabeth University Hospital (QEUH) 8
   - Table 3. Special Ventilation Rooms – Royal Alexandra Hospital (RAH) 9
   - Table 4. Special Ventilation Rooms – Glasgow Royal Infirmary (GRI) 10
7. Emerging Pathogens – COVID-19 11
8. Evidence Base 11

1. Responsibilities

Health Care Workers (HCW) must:

- Follow this SOP.
- Follow the advice of the Infection Prevention Control Team (IPCT)
- Escalate to line manager if they are unable to follow this SOP.

Managers must:

- Support HCWs in following this SOP.
- Cascade new policies/SOPs to clinical staff.

Infection Control Teams must:

- Keep this SOP up-to-date.
- Provide education opportunities on this SOP.

Facilities / Estates Teams must:

- Carry out validation on all rooms annually or following any works carried out on the room.
- Keep up-to-date validation records.

2. General Information on Specialist Ventilation

Across NHS Greater Glasgow and Clyde there are a number of specially ventilated rooms designed to protect patients within the healthcare environment from potentially harmful pathogens. The tables below provide a list of wards and rooms on each of the main hospital sites, indicating the type of ventilation and filtration available in each. This will direct staff to the correct placement of patients who are suspected or confirmed to have an airborne or high consequence infectious disease, as well as airborne protective isolation for immune compromised patients. Below is a description of what each type of ventilation means, while Table 1 should be used to guide staff to the type of patient that can be safely cared for in each.

3. What is a Positive Pressure Ventilated Lobby (PPVL) Room (HEPA and NON-HEPA filtered air)

A PPVL room has a flow of air from the lobby which moves into the main room. The contaminated air is extracted via a vent in the en suite toilet when one is available. In all instances in QEUH and RHC there is an additional extract in variable locations in the ceiling of the patient room. The lobby itself is positively pressurised to both the patient's room and the outer corridor providing a barrier between the patient within the room and the surrounding ward. This movement of air effectively prevents infection spreading between the room and the surrounding ward. Some PPVL rooms have an air supply to the lobby via a filter (HEPA filter) providing some further protection for patients who are immunosuppressed within the room. It is important to keep the door to the main room and to the lobby closed when not in use to ensure that this flow of air is maintained. The pressure on the gauge from corridor to lobby should read +8 to +12 PA.

4. What is a Negatively Pressured Room

A negative pressure room has a flow of air which moves from the corridor into the room preventing the escape of room air to the surrounding ward. The ventilation within the room is such that it dilutes any airborne pathogens which are circulating. The room provides a negative air flow / 'cascade' from ward corridor to lobby, and lobby to isolation room, whilst allowing control of room temperature. The room is validated for 10 air changes per hour within an isolation room and a pressure differential of -8Pa to -12Pa in relation to the corridor. It is important to keep the door to the main room and the lobby closed when not in use to ensure that this flow of air is maintained.

5. What is a BMT Room

BMT rooms are reserved for use by those patients who are highly susceptible to infection, for example, those undergoing bone marrow transplant. The air supply to the room is via a filter (HEPA filter) to further provide protection to the vulnerable patient within the room from external airborne pathogens such as fungi. These rooms are currently only located within Ward 2A Children Hospital (ward is currently closed), and also Ward 4B in the QEUH, and are reserved for use by BMT patients (These rooms do not have lobbies). The BMT rooms in Ward 4B QEUH are validated. The validation is derogated to deliver 6 ac/h and 10 Pascals +ve pressure from room to corridor. It is important to keep the door to the main room closed when not in use to ensure that this flow of air is maintained especially as the corridor is not HEPA filtered air.

6. Room Types

Type of Room	Contraindications	Patient allocation / suitability
PPVL without HEPA	Varicella Zoster, MDR-TB or High Consequence Infectious Disease, Immune compromised patients as non-HEPA filtered	Patients with Atypical Mycobacteria (CFs)
		Patients with airborne infection, only after discussion with (ICD or on-call microbiologist).
		Patients with infections (non-airborne route)
PPVL with Lobby HEPA	Airborne infection unless discussion with IPCT (ICD or on-call microbiologist)	Immunosuppressed patients, i.e. Haem-onc patients, should be prioritised for these rooms
		Immunosuppressed with chickenpox / measles on discussion with IPCT
		Patients with Atypical Mycobacteria
		Patients with infections (non-airborne route)
Negative pressure	Any patient with very low immunity, i.e. Bone Marrow Transplant (BMT) patients	Chickenpox, Measles, Pathogens of High Consequence
		Tuberculosis (incl MDRTB and XMDRTB)
		VHF
		MERs, COVID-19
BMT Rooms	Contraindications should include airborne infections, C. diff and norovirus	Bone Marrow Transplant patients These are located in specialist units QEUH 4B RHC 2A (currently closed) WoSBOC A summary of these room is not included in this SOP

Signage

Patient bedrooms with specialist ventilation will have a sign at the door indicating the specific ventilation afforded by that particular room. The signs will be similar to those below with local details.

Negative Pressure
Isolation Room

Pressure gauge should be between

-8Pa & -12Pa

If the positive side of the gauge is out of range please contact estates department
Help desk 5555

HEPA FILTERED PPVL
Isolation Room

Pressure gauge should be between

+8Pa & +12Pa

If the positive side of the gauge is out of range please contact estates department
Help desk 5555

NON-HEPA FILTERED PPVL
Isolation Room

Pressure gauge should be between

+8Pa & +12Pa

If the positive side of the gauge is out of range please contact estates department
Help desk 5555

Table 1. Special Ventilation Rooms – Royal Hospital for Children (RHC) (additional comments re immunosuppressed patients while Ward 2a/b closed)

Location	Room Number	Type of Room	HEPA filter (Lobby supply)	Type of Patient	Comment	En suite Y/N	Validation Date
CDU	18	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	Y	17.09.19
1D	5	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	N	09.10.19
1D	12	PPVL	Yes	Airborne	Prioritise Immunosuppressed	N	28.03.19
1D	17	PPVL	Yes	Airborne	Prioritise Immunosuppressed	N	28.03.19
1D	18	PPVL	No	Airborne	Not immunosuppressed	N	28.03.19
1E	13	PPVL	Yes	Airborne	Prioritise Immunosuppressed	Y	26.09.19
1E	14	PPVL	Yes	Airborne	Prioritise Immunosuppressed	Y	26.09.19
2C	5	PPVL	No	Airborne	Not immunosuppressed	Y	28.03.19
2C	6	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	Y	28.03.19
3A	15	PPVL	Yes	Airborne	Prioritise Immunosuppressed	Y	28.09.19
3A	16	PPVL	No	Airborne	Not immunosuppressed	Y	28.03.19
3B	19	PPVL	No	Airborne	Not immunosuppressed	Y	05.11.19
3B	5	PPVL	No	Airborne	Not immunosuppresses	Y	28.03.19
3C	9	PPVL	Yes	Airborne	Prioritise Immunosuppressed	Y	28.03.19
3C	10	PPVL	Yes	Airborne	Prioritise Immunosuppressed	Y	21.03.19

Table 2. Special Ventilation Rooms – Adult Queen Elizabeth University Hospital (QEUH)

Location	Room Number	Type of Room	HEPA filter (Lobby Supply)	Type of Patient	Comment	En suite Y/N	Validation Date
HDU UNIT 1	3	PPVL	No	Airborne	Not immunosuppressed	N	14.06.19
HDU UNIT 1	4	Negative Pressure	Yes	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	N	21.06.19
HDU UNIT 2	11	PPVL	No	Airborne	Not immunosuppressed	N	19.02.19*
ICU UNIT 3	23	PPVL	No	Airborne	Not immunosuppressed	N	06.02.18*
ICU UNIT 3	24	Negative Pressure	Yes	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	N	22.05.19
ICU UNIT 4	31	PPVL	Yes	Airborne	Prioritise Immunosuppressed	N	07.11.18*
ICU UNIT 4	40	PPVL	No	Airborne	Not immunosuppressed	N	06.02.19*
ICU UNIT 5	43	Negative Pressure	Yes	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	N	02.04.19
ICU UNIT 5	44	Negative Pressure	Yes	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	N	?
HDU UNIT 6	50	PPVL	Yes	Airborne	Prioritise Immunosuppressed	N	26.03.19

*rooms that require validation

Table 3. Special Ventilation Rooms – Royal Alexandra Hospital (RAH)

Location	Room Number	Type of Room	HEPA Filter (Lobby Supply)	Type of Patient	Comment	En suite Y/N	Validation Date
ICU	2	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	N	04.02.19*
ICU	5	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	N	20.02.20

Rooms that require validation are marked with *. Estates are aware of this and are awaiting access to undertake revalidation. As soon as the IPCT are notified that of these rooms having passed revalidation, the document will be updated.

Please note there are no negative pressure isolation rooms in either Vale of Leven Hospital or Inverclyde Royal Hospital.

Table 4. Special Ventilation Rooms – Glasgow Royal Infirmary (GRI)

Location	Room Number	Type of Room	HEPA Filter (Lobby Supply)	Type of Patient	Comment	En suite Y/N	Validation Date
6	3/25	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	Y	22.07.19
6	3/39	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	Y	25.07.19
7	3/52	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	Y	25.07.19
16	3/31	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed	Y	25.07.19
ICU WEST	7	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed Used as **third** choice	N	10.02.20
ICU WEST	10	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed Used as **fourth** choice	N	10.02.20
ICU EAST	11	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed Used as **second** choice	N	10.02.20
ICU EAST	12	Negative Pressure	No	Varicella Zoster, TB, VHF, MERS, COVID-19	Not immunosuppressed. **This room should be prioritised and used first.**	N	10.02.20

7. Emerging Pathogens – COVID-19

Background (HPS February 2020)

In late December 2019, the People's Republic of China reported an outbreak of pneumonia due to unknown cause in Wuhan City, Hubei Province. In early January 2020, the cause of the outbreak was identified as a new coronavirus, named novel coronavirus (COVID-19). While early cases were likely infected by an animal source in a 'wet market' in Wuhan, ongoing human-to-human transmission is now occurring.

There are a number of coronaviruses that are transmitted from human-to-human which are not of public health concern however the COVID-19 can cause respiratory illness of varying severity. Currently there is no vaccine and no specific treatment for infection with the virus.

On 30 January 2020 the World Health Organization declared that the outbreak of 2019-nCoV constitutes a Public Health Emergency of International Concern.

The collection of resources on this page contains information and advice on novel coronavirus (COVID-19).

https://www.hps.scot.nhs.uk/a-to-z-of-topics/wuhan-novel-coronavirus/

PLEASE NOTE THAT IN THE ABSENCE OF A NEGATIVE PRESSURE ROOM, A STANDARD ISOLATION ROOM WITH AN EN SUITE IS AN ACCEPTIBLE ALTERNATIVE FOR PATIENTS WITH CONFIRMED OR POSSIBLE COVID-19.

8. Evidence Base

https://www.hps.scot.nhs.uk/a-to-z-of-topics/wuhan-novel-coronavirus/

http://www.nipcm.hps.scot.nhs.uk/

https://www.hps.scot.nhs.uk/a-to-z-of-topics/middle-east-respiratory-syndrome-coronavirus/

Duty of candour and communication during an infection control incident in a paediatric ward of a Scottish hospital: how can we do better?

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ABSTRACT

Duty of candour legislation was introduced in Scotland in 2018. However, literature and experience of duty of candour when applied to infection control incidents/outbreaks is scarce. We describe clinician and parental perspectives with regard to duty of candour and communication during a significant infection control incident in a haemato-oncology ward of a children's hospital. Based on the learning from this incident, we make recommendations for duty of candour and communication to patients and families during future infection control incidents. These include the need to consider a crisis management approach, the importance of not underestimating psychological harm in incidents of a prolonged duration and embedding the existing legislation pertaining to the rights of the child.

INTRODUCTION

Duty of candour legislation was introduced as a statutory requirement in England in 2014.[1] Issues with openness and transparency were highlighted in the 2013 Francis Inquiry report which examined failings in care at Mid Staffordshire National Health Service (NHS) trust.[2] One of the many recommendations from this report was to implement duty of candour legislation. Scotland followed suit with duty of candour becoming a legal, statutory requirement in April 2018.[3]

Duty of candour refers to the ethical responsibility for healthcare professionals to inform patients or their families when mistakes have been made and they may have suffered harm or death as a result. It involves apologising, acknowledging and explaining what has happened to patients. Duty of candour is applied where moderate or severe harm has been determined to take place. Box 1 illustrates the levels of harm where duty of candour should be triggered if the event was unintended or unexpected and related to the patient safety incident rather than the patient's natural disease course.[4]

Organisations have a responsibility to support staff reporting adverse incidents and systems must be in place in order for them to do so.[5] Professional bodies such as the General Medical Council have guidance and examples available to guide healthcare workers.[5] However, hospital-acquired infection control outbreaks/incidents do not feature, and guidance for this area is lacking. What constitutes a duty of candour event and what is the definition of harm in relation to an infection control incident? We describe our experience of duty of candour in relation to an infection control incident occurring in a children's hospital, from the perspective of both a clinician and a parent.

The infection control incident

In February 2018, following a rare and unusual bloodstream infection in a paediatric haemato-oncology patient, water testing revealed widespread contamination of the hospital water and drainage system. Further cases were detected and investigations evolved over a prolonged period lasting from early February to the end of September 2018. Due to a failure to control the ongoing source and to enable implementation of more aggressive infection control measures, the children's' ward was closed, and patients and families were relocated to a ward in the neighbouring adult hospital. Initially, this was planned to be a temporary decant with plans to move the children back into their original ward by Christmas 2018. However, investigations revealed further evidence of environmental risk and remedial work remains ongoing. The situation was further complicated by the development of more infections in children in the new and perceived safe ward setting in June 2019 with further environmental risk factors being identified. Risk mitigation measures were implemented and infection rates in 2020 remain low.

CLINICIAN PERSPECTIVE

This clinician perspective is written by an infection control doctor who was the chair of the Incident Management Team (IMT).

Hospital-acquired infections are more often than not sporadic cases and typically communicated by the patient's clinical team. For the most common hospital-acquired infections, for example, Methicillin-resistant *Staphylococcus aureus*, *Clostridium difficile* infection, there are well-established patient information leaflets available. In many NHS boards, a single case of preventable *S. aureus* bacteraemia will initiate a serious clinical incident review. Single episodes of hospital-acquired infections might also be classified as a duty of candour event if related to a preventable source and harm ensued, for example, bloodstream infection secondary to a contaminated infusate. Postoperative surgical site infections are highlighted as a risk during the consent procedure but might constitute a duty of candour event if there was clear organisational failing such as failure to sterilise equipment or suboptimal operating theatre ventilation, leading to harm.

Box 1 Examples of moderate and severe harm

Death of patient

Severe harm—permanent lessening of bodily, sensory, motor, physiological or intellectual functions

Harm which results in:

1. Shortened life expectancy.
2. Increased treatment.
3. Changes to the structure of the patient's body.
4. Impairment of sensory, motor or intellectual functions of the patient which has lasted (or is likely to last) for at least 28 days continuously.
5. Pain or psychological harm that has lasted (or is likely to last) at least 28 days continuously.

Outbreak situations can be more complex and may involve multiple patients and families requiring an apology if harm has ensued. No one outbreak or incident is the same and bespoke decisions about duty of candour will be required for each circumstance. Often outbreaks in the hospital setting are short lived, however occasionally they can become protracted lasting >28 days.

Following the issue of the Scottish guidance in 2018, the lead author, an infection control doctor, introduced duty of candour as an agenda item for all infection control incidents/outbreaks within the organisation. This was first tested during the aforementioned prolonged incident related to a contaminated water system involving paediatric haemato-oncology patients who developed hospital-acquired infections. Where patients met the outbreak case definition, the infection control doctor accompanied the patient's clinician to apologise to families, answer questions and provide assurances.

Cause and effect may be clearly identifiable for most duty of candour situations, however infection control incidents are characterised by less certainty. Some outbreaks, such as the aforementioned, require multiple hypotheses to be investigated with a subsequent need to evaluate the control measures. Incidents may be multifactorial requiring a multimodal strategy to prevent further cases. Duty of candour in such a situation becomes more complex due to an evolving situation, a lack of definitive cause and effect early on and an inability to determine the weight of any particular intervention. As a result, the initial conversation with families can be a source of frustration for both parties, with patients and families seeking definitive answers which clinicians are unable to commit to.

As the outbreak in this haemato-oncology unit evolved, duty of candour and effective communication became more challenging. While families whose children met the outbreak case definition were spoken to, others, whose children did not develop infections, received communication in the form of written statements. As part of the outbreak communication strategy, press statements were issued to the public and on occasion were released before parents had been communicated with, causing considerable distress.

The psychological harm associated with such a prolonged incident was underestimated. Haemato-oncology patients are more susceptible to hospital-acquired infections due to both the underlying disease itself and also the treatment and presence of central lines. As such, patients and families are very aware of infection risk and will practice infection control in the home environment. They require assurances that the hospital environment is safe and that all measures have been taken to mitigate risk. Parents of children who had infections were concerned regarding repeat episodes, those whose children had not developed infections were concerned regarding the ongoing risk to their child and those of children who were outpatients were concerned about the safety of day care and clinic attendance. The need for duty of candour and effective communication becomes more crucial in such a situation. Various strategies were employed; written information continued to be provided with all inpatients being spoken to by the infection control doctor, the patients' clinicians and a hospital manager. Outpatients were spoken to in groups and some were contacted by telephone. Later in the incident social media was used establishing a closed Facebook group. Adequate assurances regarding the environment were not sufficient and information was not considered to be open, transparent and timely. The situation was compounded with the closure of the paediatric ward and the relocation of patients into a ward within the adult hospital, one not designed with a paediatric patient and their families in mind. Further anxiety and mistrust developed following the development of further infections in this new ward setting in June 2019. Subsequently, oversight was provided by the Scottish Government and the closed Facebook site was used, with answers to parent questions publicised.

The significant learning from this incident is that patients and families should be communicated to in a timely, open, transparent fashion, with frequent updates. Information should be released ahead of and containing the media lines to avoid the anxiety of finding out via this route. Every effort should be made to provide families with assurances that control measures have been implemented and that the risk has been mitigated. Where risk remains, it must be explained along with the proposed strategy to mitigate. Duty of candour remains an underdeveloped area with respect to hospital-acquired infection incidents and further thought is required with future policy development. With respect to duty of candour, consideration must be given to what constitutes harm for the particular patient group and this should be continually reassessed during an evolving situation. Psychological harm should not be underestimated. While there may be reticence by an organisation to discuss ongoing investigations and unconfirmed hypotheses, from the experience of the lead author and IMT chair, families valued honesty and assurances that everything was being done that could be done, over any withholding of information. IMTs must develop clear communications and duty of candour strategy particularly where an incident is likely to be of a prolonged nature. Significant resource may be required and consideration should be given to a communications subgroup of the IMT.

Parent perspective

This parent perspective is written by a patient's [redacted] whose child developed an infection while on the ward.

My first duty as a parent is the care, safety and well-being of my child; to protect [redacted] from the various threats, risk and harm that may expose and exploit [redacted] known or, as yet unknown vulnerabilities as she progresses through her young impressionable life.

Such protection is influenced by information, both from my own experience and the experience of other, trusted sources and as such, informed decision-making is critical in identifying, managing and mitigating the various risks that are prevalent during my child's lifetime, including those impacting [redacted] health.

However, when my child was diagnosed with cancer, I realised that I had neither the knowledge, experience or expertise required to adequately identify, respond, manage or

communicate on behalf of my child, the complexities and impact of [redacted] medical condition. Decisions made during such prolonged treatment may have a profound impact now and in the future.

As such there was a requirement to place my faith, trust and honesty in those who will care for my child. There was a requirement to have implicit trust in 'strangers', relinquishing that first duty to protect and care for the most precious of commodities, my child. To hand over such control, is the hardest of things, a decision that will influence the physical, emotional and psychological effect now and in the future of both my child and my family.

There results a tremendous sense of helplessness, fear, anguish and guilt; guilt that I have failed to protect my child; guilt that I have devolved responsibility for my child's care to people I know nothing about; fear that I have placed my trust in individuals and an organisation that I hope will make decisions in the best interest of my child.

It is for the above reasons that I am required to have confidence in the health service, believing that there will be processes and procedures in place, governed by experienced and knowledgeable professionals. I had to believe that during the hardest times they will respect, protect and fulfil their statutory requirement to ensure that the best interests of my child would be a primary consideration in all actions concerning [redacted].

The treatment of cancer, especially in children, is distressing for all concerned not least of all the child. There is an absolute requirement for open and honest discussion between the clinicians and my child and myself as [redacted] parent. The risks associated with the treatment of the cancer are laid bare, however nothing prepared me for the heartache of watching the 'treatment' take effect; the physical, emotional and psychological trauma that develops with the many identified side effects articulated by those I have developed relationships and built trust. Understanding the likelihood of infection, including hospital-acquired infections as a result of being immunocompromised is part of the learning curve and an acceptable risk that is managed and mitigated with increased awareness and implementation of necessary and proportionate control measures.

One such control measure, that enables the impact and implications of 'harm' or the potential increase in harm caused or likely to be caused to my [redacted] by an unintended or unexpected incident or series of incidents, is the duty of candour. However, the implementation of this control measure is depending on the understanding of its use by those who seek to implement it. The effective implementation of such statutory responsibility serves to build and indeed enhance trust between the clinicians, my [redacted] and our family. As such, when my [redacted] contracted a bacterial infection it was crucial that openness and honesty were exercised through the exchange of information, not least of all to enable all of us to understand how this occurred within those existing control measures. It is not necessary for us to know the source of the infection, although if it was known, should have been disclosed. However, when unknown this should be articulated in a timely and transparent fashion, enabling informed decisions to be made that can influence future protection measures and minimise further physical, emotional and psychological trauma. Indeed, if such infections are identified as hospital-acquired infections, this should be identified and disclosed immediately.

However, when one considers theenvironment and the extremely close relationships of patients and theirrespective families within a paediatric haemato-oncology ward, multiple hospital-acquired infections aresoon exposed increasing our individual and collective fear and alarm as to theenvironment in which our children aretreated.

DISCRETION

An important aspect within duty of candour should be the continual evaluation by those discharging their duty of the impact and implications for the patient and those acting on behalf of the patient while having an ability to apply discretion in making decisions through the use of reasoning and professional judgement. However, discretion, when applied, should be recorded to reflect such decision-making, ensuring that the risks of doing against the risks of not doing, are clearly documented with due regard to likely harm, then and in the future.

It is the case that during complex cases, the aggregated impact of physical, emotional and psychological harm may result in the patient and or family being considered too vulnerable for further information or that their emotional state renders them temporarily vulnerable. In such circumstances, it is considered prudent to consider discretionary decision-making within their statutory duty as this may alleviate further harm. This is in essence a reciprocal duty of candour, proactively protecting the patient and family until such times as they have suitably recovered, to receive the information.

If discretion has been exercised by the statutory body, with proper recording of such decision-making, including rationale for doing so, there should be further written acknowledgement of the fact that patient care was not adversely impacted and that as soon as is reasonably practicable the patient and/or their family should be advised accordingly. This will have the further safeguard of ensuring corporate knowledge among clinicians resulting in the development of corporate memory and resultant corporate approach to duty of candour, with due regard to the respect for their patient and their rights.

DISCUSSION

Since 2018, the Queen Elizabeth University Hospital and Royal Hospital for Children in Glasgow have been ensconced in a developing crisis, attracting media and political attention, ward closures, and numerous independent and internal investigations as to the cause of numerous outbreaks. Indeed, public anxiety has increased resulting in Crown and Procurator Fiscal Service initiating inquiries into deaths within a healthcare setting, a public inquiry under the Inquiries Act 2005 with wide-reaching terms of reference and an independent case note review of 85 patients from the haemato-oncology ward will be undertaken. A documentary on national television exposed identified risks. Lack of management and oversight and internal conflict have impacted on the levels of public confidence and increased anxiety. The aggregated impact on an already vulnerable patient group is enormous, impacting further on their emotional, physical and psychological well-being. Trust between the patients/families and the health board is further eroded making the need for more effective use of duty of candour and effective communication even more crucial.

Duty of candour in relation to infection control incidents is new and evolving, and we were unable to find any published literature in this area. However, much can be learnt and applied from other areas of medicine and there are similarities to our

experience. One such example is the cervical check audit in Southern Ireland whereby 208 women with cervical cancer had original smear tests that were inaccurately reported as 'all clear'.[6] Initially these audit results were used for education and training purposes until the Health and Safety Executive requested that audit results should be passed to the women involved. Much debate took place as to whose responsibility it was to inform the affected women, with eventually letters being sent to relevant clinicians looking after the patients. What ensued was a chaotic and hurried approach influenced by politics and media. Some women were in the unfortunate position of finding out via the media, others described insensitive conversations with clinicians and a lack of confidence arose between women and the clinicians involved in their treatment. This incident highlights the counterproductive effects of inadequate communication and transparency, and demonstrates how these can lead to erosion of confidence and a breakdown in trust.

In 2020, an NHS trust in England became the first to be fined for failed duty of candour in relation to an elderly patient who died following a perforated oesophagus during endoscopy.[7] A lengthy time to respond and a poorly worded apology transpired between family members and the organisation.

In our incident, there was significant impact on patients and families having been, displaced from the bespoke wards, created to cater for their complex clinical care, deprived of the support of peer group relations such as those provided through the likes of Teenage Cancer Trust. How has the impact on those vulnerable children been measured and how could the duty of candour have more effectively been discharged through recognising the unique circumstances of this outbreak?

It is the right of every young person to have assurance that proper consideration has been given to the impact that a policy/measure will have on children and young people up to the age of 18 years. Indeed, it is important to ensure that any measures adopt a human rights-based approach. Making this clear within any effective governance structure and resultant policy or procedure would be in line with the Scottish Government's commitment to incorporate the United Nations Convention on the Rights of the Child (UNCRC) into Scots law and to embed human rights within the work of the government.[8]

In taking such an approach it is important to recall that human rights are interdependent, indivisible and inter-related. This means that respect and fulfilment of the right to the highest attainable standard of health (Art 24 UNCRC) depends on other rights being similarly respected.[9] In particular, Article 13 of the UNCRC provides the right to receive and impart information, while Article 12 requires children to be able to participate in decisions made about and for them.[9]

The WHO has identified that participation and inclusion are key to taking a human rights-based approach in a health setting. As the WHO notes, 'Participation increases ownership and helps ensure that policies and programmes are responsive to the needs of the people they are intended to benefit. Information sharing is a critical component of participatory processes.'[10]

The Scottish Government Child Rights and Well-being Impact Assessment (CRWIA) Guidance was originally produced for Scottish Government officials but is also suitable for use by public authorities such as health boards.[11] The guidance sets out steps for governance groups that will enable them to gather and produce evidence as to the impact and implications of a policy/measure, such as duty of candour, has on children and young people. The CRWIA follows current impact assessment practice and uses two identified frameworks: the UNCRC[8] which the Scottish Government, along with other duty bearers, is required to respect, protect and fulfil; and child well-being indicators developed as part of the Get It Right For Every Child approach to children's services provision in Scotland. CRWIAs will help clinicians and health board officials cater for the needs of children and young people impacted on by such crisis management. It will also ensure issues with openness and transparency and their statutory responsibility under the 2018 Act relative to duty of candour are satisfied together with ministerial duties in part 1 of the Children and Young People (Scotland) Act 2014.[12] This includes the duty to report progress on the implementation of the UNCRC to the Scottish Parliament every 3 years.

CONCLUSION

While there is a lack of literature pertaining to duty of candour and infection control incidents, there are parallels between other duty of candour incidents and the incident we describe. There was a hurried and chaotic approach influenced by media and political oversight. It is critical that effective governance and proactive communication is delivered regardless as to the identified source(s) of the outbreak(s), in a consistent, open and honest manner that seeks to reassure and enable patients and their families with opportunities to engage in dialogue, make informed decisions and seek assurances. If this is not managed from the outset, an outbreak can quickly become a crisis, which consumes the governance structure charged with managing and mitigating the outbreak. It is the case that distinction must be drawn between the role of an IMT and Crisis Management Team required to manage the critical incident supported by more prominent and transparent strategic leadership, coordination, governance, resilience, business continuity and public engagement. This would enable a focus on communications and duty of candour leaving the IMT to concentrate on investigating and implementing control measures. It would ensure timely, responsive, reassuring and accessible communication with the patients and families involved in order with a view to minimising the anxiety and distress experienced during similar incidents.

Twitter Teresa Inkster [redacted]

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UK Health Security Agency

UKHSA Colindale
61 Colindale Avenue, London NW9 5HT

Switchboard: 020 8200 4400
Website: https://www.gov.uk/specialist-and-reference-microbiology-laboratory-tests-and-services

CONSULTANT MICROBIOLOGIST
MICROBIOLOGY DEPARTMENT
LEVEL 4 LAB MEDICINE BUILDING
QUEEN ELIZABETH UNI HOSPITAL
1345 GOVAN ROAD
GLASGOW SCOTLAND

G51 4TF

Sender's ref. No. [redacted] ✓
PHE ref. No. [redacted]
Date received 05.04.2022

Billing reference
Outbreak/Investig. No
Ilog number
Project code

Hospital No.
Sex [redacted] Date of birth [redacted] Age [redacted]
NHS number [redacted] ✓ Patient postcode
Name [redacted] [redacted] ✓
Date of collection 23.03.2022 ✓

Isolation site Other
Isolation site other tissue from left neck

Laboratory report

[redacted]

Opportunistic Pathogens Section

1. *Stenotrophomonas maltophilia* (Sender's identification)

PFGE Result: [redacted]

Result comment:
Comparison by pulsed-field gel electrophoresis has shown that this isolate, while not exactly matching any other isolate, clusters with previously reported representatives of [redacted].

Initial tasks when performed on Reference Lab reports

PORTAL	[redacted]
DART	
CHECKED by MEDIC	

Authorised by Dr. Jane Turton, Clinical Scientist, Antimicrobial Resistance and Healthcare Associated Infections Reference Unit (AMRHAI). Tel: [redacted]
email: amrha[redacted]

Date reported: 17.04.2022 08:55
Page 1/1 Date printed: 17.04.2022 08:55

19 APR 2022

A49906791

NHS Greater Glasgow and Clyde

Response To Questions Around Ward 6A, QEUH

List of questions and points raised by the families of children treated on the haemato-oncology wards at Queen Elizabeth University Hospital and Royal Hospital for Children with the Cabinet Secretary for Health and Sport. These responses were issued to families on 30th October 2019.

Response from NHS Greater Glasgow and Clyde

Following meetings parents had with the Cabinet Secretary for Health and Sport about infection issues in the Queen Elizabeth University Hospital (QEUH) and Royal Hospital for Children (RHC), a number of questions have been posed, and NHS Greater Glasgow and Clyde (NHSGGC) welcomes the opportunity to answer these fully and transparently.

The remainder of this document will address each individual question posed to us in detail. Before we do so, we wish to be clear that the safety and wellbeing of our patients and their families has, and remains, our key priority, and we are very sorry that some of those in our care have had worries about the hospital environment, at what is an already difficult time.

If, as a result of the points being addressed, any individuals have additional questions specific to their child's care and treatment, they are welcome to contact Jennifer Haynes in the Board's Headquarters, who will ensure their concerns are addressed. Jennifer's contact details are:
Jennifer.Haynes[redacted] or call: [redacted]

The Cabinet Secretary for Health and Sport has also appointed Professor Craig White, Divisional Clinical Lead from the Scottish Government to lead and direct the work required to ensure that the voices of the families affected are heard and that the information they have asked for and entitled to receive is provided as a matter of priority. Professor White can be contacted at: Craig.White[redacted] or call: [redacted]

The families raised the following specific points:

- Environment questions
- Treatment questions
- Communication questions
- Issues raised that will potentially fall within the remit of the Public Inquiry or are within the remit of the Independent Review.

Environmental questions: 1-30

1 – Is the ventilation and water system currently safe?

2 – Is the hospital a safe place for the children – as the families are too scared to take them in for fear of infection and want to keep them at home?

3 – Can reassurance be provided that all the clinical environment is safe?

4 – There needs to be a check to ensure that the water from the showers drains away properly and doesn't leak back into the rooms

5 – A copy of the HPS water contamination report should be shared with the families.

6 – There needs to be a complete holistic look into the environment in the wards to ensure they are clean and safe.

7 – Why are the remediation works to the wards taking so long and why are there problems in the decant wards? Are the works so far just a sticking plaster?

8 – The works in ward 6A need to be investigated with details then provided on progress.

9 – The extent of the works and the length of time until they are completed in wards 2A and 2B needs to be checked thoroughly with all details provided.

10 – Why are the rooms not cleaned properly so the families have to clean the rooms themselves and have to bring in their own bedding?

11 – Why are there so few facilities on ward 6A, including the facility to make tea and coffee, warm up food in a microwave, play area for the children, space for the parents to talk and discuss very difficult issues? In addition, the available food is poor and expensive on site which compounds the problems.

12 – Are there enough cleaners on the wards?

13 – Why were parents told that ward 6A would have a play room for children when it did not?

14 – There is a lack of room for fold down beds for parents, the blinds don't work, the TVs also don't work. The lack of natural light in particular effects the children when they do go outside.

15 – Why did the Board not consider all these vital issues, relating to the lack of facilities when decanting the patients – in particular did they consider the effects on the mental health of the patients and their families?

16 – Why aren't there enough electrical plugs in the rooms for all the medical equipment?

17 – Why don't the batteries work in the mobile drip stands?

18 – Why do the trolleys have defective wheels?

19 – Have the Board considered the practical difficulties in terms of patients using safe toilet facilities, without contaminated water, given the difficulties in moving with drip stands,

etc?

20 – How can the water be usable now in ward 2A/2B given that there are still restrictions in the floors directly above and below?

21 – What happens next if the QEUH campus is not safe and what is the backup plan?

22 – What if the water system is found to be unsafe – is a plan B being considered at the moment?

23 – Is the QEUH campus itself safe?

24 – Is the overall water supply across the QEUH campus safe – in particular, McDonald House and the local residents use the same water supply so do they have the same problems?

25 – The Healthcare Improvement Scotland HEI inspection in March and 2018 didn't go to the oncology wards or ward 6 – what was the reason?

26 – The families want to liaise directly with Healthcare Improvement Scotland on these issues.

27 – Why is the day care room at the other end of the ward – which is in itself an infection risk?

28 – When specifically were the water filters put into the theatres?

29 – Is the cladding on the buildings where wards 2A/2B and ward 6A are located safe?

30 – Why was one of the kitchens on ward 6A shut recently – it was suggested this was down to fungus being found?

Treatment questions: 31-50

31 – Are there sufficient infection prevention and control prevention measures in place?

32 – Are children getting drugs they don't need?

33 – An explanation of the outbreak monitoring process, and the involvement of HPS should be provided to the families.

34 – Is there an infection risk because of the smell from the nearby sewers in the QEUH campus? In particular there is a smell in the isolation ward and reassurance is sought that they are safe.

35 – Why were patients given medication, for infections, which is only supposed to be used for a week?

36 – Why were patients given prophylaxis without consent of the parents?

37 – Why if all the infection prevention and control measures are in place are the patients still being given prophylaxis?

38 – Are the clinicians all able to access the same, correct, information?

39 – Why are the staff washing their hands in contaminated water?

40 – Why are families being told that their child has not got an infection only for them to be subsequently treated for the infection?

41 – Do families have sufficient access to relevant medical records – in particular as diagnosis has been changed or even denied on a few occasions?

42 – There needs to be external scrutiny of the Board.

43 – What are the long term effects on health given the delay in treatment caused by the infections?

44 – Why were toys, particularly those from a local charity not allowed on the ward and who made the decision?

45 – Where will the children go if the wards are not safe? For example are the only other suitable hospitals in Newcastle, Manchester and London? (for bone marrow treatment.)

46 – Have the Board considered issues such as patients having to travel to different wards to use the toilets because of the risk posed by contaminated water?

47 – Has the Board considered the mental health effects on the families and in particular the children, who through a lack of facilities are in effect institutionalised.

48 – Why is there an issue with patients getting chemotherapy overnight? Are the correct clear details being provided?

49 – Where do the patients go if they have a spike in temperature?

50 – Is there an argument for moving the Schiehallion patients to Edinburgh and retrospectively fit Glasgow in the meantime?

Communications questions: 51-65

51 – The families need to know exactly what is happening – as at the moment they have no details or understanding of the remedial works.

52 – Why was advice given by staff that patients were perfectly safe in terms of infection risks from the environment but then contradicted by other staff who said that the environment, and water, was not safe? This led on occasion to the position changing overnight and patients being moved at very short notice.

53 – Who has the information that the wards are safe? Where does it come from and why is there so much contradiction?

54 – Why are the families not being told everything about their children's treatment, in terms of what medication is required and what might be the side effects?

55 – Why are staff members told to not tell the facts and the truth of the situation?

56 – Why did families first hear in the STV news about the 6 children moving?

57 – Why did the NHSGGC management not explain the situation and instead offered no communication – they appear to be concerned about legal action?

58 – Why is the Board so defensive?

59 – Why are the staff prevented from telling the truth – why do they have their hands tied?

60 – Why did the Board issue a press release stating that the water was safe to drink when the families were clearly told that it wasn't safe to drink? Why did the Board lie?

61 – All the staff, including the clinical staff need to be praised for their hard work and providing fantastic care – they should not be singled out for criticism.

62 – Why is the Board not speaking to the families and complying with the Duty of Candour Legislation?

63 – Reassurance was sought that the patients won't be stuck in a ward which doesn't provide oncology care and therefore the relevant protocols.

64 – A public apology is also needed from NHSGGC to clinicians and staff who have being doing their jobs very well. This would start to build trust. There needs to be real engagement with the staff as they feel vulnerable.

65 – Why did the children get moved into an unsuitable adult ward?

Issues raised that will potentially fall within the remit of the Public Inquiry or are within the remit of the Independent Review: 66-70

66 – Is there a risk because the QEUH campus (including the RHC) was built next to the main sewage plant?

67 – Why were patients admitted to wards 2A and 2B after meeting minutes established that the ventilation was not fit for purpose prior to the ward opening?

68 – Why are all the problems happening in a new hospital?

69 – Can the Terms of Reference of the Public Inquiry have child/patient experience at the heart of it?

70 – Confirmation that a decision will be taken by the chair of the inquiry (following appointment) as to persons who will be required to attend or otherwise provide evidence to the inquiry, for example the First Minister (who was Cabinet Secretary for Health and Sport at the time of the QEUH's construction) and former Chief Executives/senior staff.

(Content first published in January 2020)

RE: PICU Ventilation Verification

Conner, Darryl James <DarrylJames.Conne[redacted]>

Tue 09/07/2019 13:14

To: Peters Christine (NHS GREATER GLASGOW & CLYDE) [redacted]; Valyraki, Kalliopi [redacted]; INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]; alison.balfou[redacted] John.Hood[redacted]; Rolls Gael (NHS GREATER GLASGOW & CLYDE) [redacted]; angela.johnson[redacted];

Cc: Connelly Karen (NHS GREATER GLASGOW & CLYDE) [redacted]; alan.gallacher[redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted]; Ian McKenzie [redacted]; Guthrie James (NHS GREATER GLASGOW & CLYDE) [redacted];

Hi Christine,

No problem , I confirm that the brazing of the pipes was the standard as part of the build insulation.

Regards
Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conne[redacted]

From: Peters, Christine
Sent: 09 July 2019 11:55
To: Conner, Darryl James [redacted]; Valyraki, Kalliopi [redacted]; Inkster, Teresa (NHSmail) [redacted]; Balfour, Alison [redacted]; Hood, John [redacted]; Rolls, Gael [redacted]; Johnson, Angela [redacted]
Cc: Connelly, Karen [redacted]; Gallacher, Alan [redacted]; Purdon, Colin [redacted]; Ian McKenzie [redacted]; Guthrie, James [redacted]
Subject: RE: PICU Ventilation Verification

Thanks again Darryl for the swift responses. It will take a bit of time to look through the information .

Re 4. Does this mean that work will need to be done to the pipes as part of scribe or are they already welded?

Kr
Christine

From: Conner, Darryl James
Sent: 09 July 2019 11:31
To: Peters, Christine; Valyraki, Kalliopi; Inkster, Teresa (NHSmail); Balfour, Alison; Hood, John; Rolls, Gael; Johnson, Angela
Cc: Connelly, Karen; Gallacher, Alan; Purdon, Colin; Ian McKenzie; Guthrie, James
Subject: RE: PICU Ventilation Verification

Hi Christine,

1. I have attached a layout drawing showing the layout detail for the RHC first floor and also a detailed drawing we have done showing the critical facilities located within this level of the RHC, this drawing shows the isolation room detail and the 4 bedded areas are large enough to interoperate visibly there selves.
2. There is no validation documentation only commissioning documentation. (Please see attached)
3. Regards the whole unit there are two supply AHUs and two extract AHUs that supply PICU with the adjacent already verified isolation rooms having their own designated plant for supply and extract.(Recent PPMS/service records attached for PICU 4 bedded units in question)
4. Regards the CVGs the design intention is to allow for medical gas leak dilution, however this design provides a source of potential ingress of contaminants, there is however a caveat within the SHTM which we have endorsed by our authorising engineer that if all medical gas pipe work within ceiling voids is welded as opposed to compressed then the leakage risk is significantly mitigated thus the requirement for CVGs is no longer required so we can and should remove them. This not only will contribute to a more sterile facility but improve the air permeability of the room envelope which will help when aiming to achieve SHTM03-01 compliance.

Best

Regards
Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
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Labs Bldg.
1345 Govan Rd
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G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conner[redacted]

From: Peters, Christine
Sent: 09 July 2019 10:12
To: Conner, Darryl James [redacted]; Valyraki, Kalliopi [redacted]; Inkster, Teresa (NHSmail) [redacted]; Balfour, Alison [redacted]; Hood, John [redacted]; Rolls, Gael [redacted]; Johnson, Angela [redacted]

Cc: Connelly, Karen [redacted]; Gallacher, Alan [redacted]; Purdon, Colin [redacted]; Ian McKenzie [redacted]; Guthrie, James [redacted]

Subject: RE: PICU Ventilation Verification

Hi Darryl,
In addition to the lay out drawings I have some questions for more information to assist in assessing the HAISCRIBE:

1. What are the pressures and ACH in the prep room and the dirty utility and any other ancillary areas?
2. Is there associated AHU validation documentation including filters and dates of changes of these?
3. Is the whole unit supplied by one AHU?
4. What was the design intention with the grilles open to ceiling void - ? safety of medical gases has been cited previously and if these are closed off what are the consequences?

Kr

Christine
Dr Christine Peters
Consultant Microbiologist
Queen Elizabeth University Hospital,
GGC
Ex [redacted]
Mobile: [redacted]

From: Conner, Darryl James
Sent: 08 July 2019 17:23
To: Valyraki, Kalliopi; Inkster, Teresa (NHSmail); Peters, Christine; Balfour, Alison; Hood, John; Rolls, Gael; Johnson, Angela
Cc: Connelly, Karen; Gallacher, Alan; Purdon, Colin; Ian McKenzie; Guthrie, James
Subject: PICU Ventilation Verification

Hi Pepi,

As discussed the annual ventilation verification of PICU was carried out at the weekend for the four bedded rooms and both side rooms, unfortunately I can report that the facility has failed as per the attached report. I have contacted Gael to inform her of the non-compliances raised within the facility and as part of estates Unsuccessful verification SOP protocol. I can advise that the verification failure was not due to inadequate air change rates, all be it some rooms will require to be rebalanced to bring the facility closer to the 10 ACHs required with respect to SHTM03-01 instead of just within 75% of design in some instances, but mainly due to the recorded pressure differentials between the 4 bedded spaces and the corridor, they should be 10 Pascal's +,but instead they were recorded to be much less,1 pascal,0 pascals or in a single instance -1 pascal.

To address these non-conformances I would like to establish a program of immediate remedial works starting from tomorrow if possible?

1. I would like to close off and HAI Scribe off one four bedded bay each day (Scribe already submitted to Angela for approval via Jim Guthrie) and carry out the following tasks :
2. Removal of the CVG located within the space and replaced with a ceiling tile.
3. The balance and reduction of the bed space extract to achieve the required + pressure DP of 10 pascals.

4. Repair any flooring and fabric repairs effecting the room envelope and air permeability.
5. Deep clean the Space worked in for hand over.

I propose to subsequently repeat this process each day for each 4 bed bay and room served by the verified plant in question in order to bring this verification to a successful status pending clinical permission and any agreed contingency's. Encouragingly The 3 PPVL isolations Rooms and the 1 Negative pressure isolation room have already been verified and passed, and with the bed bay ACH rates ranging between 8-15 ACH per hour we are not far from having a compliant facility pending the successful rebalancing of the suite. I believe it's the most logical choice to do everything we can to achieve compliance before considering more intrusive remedial works such as replacement ceilings etc.

The re-verification and balancing works for NICU/SCUBU where scheduled to start this week, but in light of today's results we will push them onto next week pending success in PICU.
Can you please clarify what issues for the adults ICU and 4B?

Thanks

Regards
Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conne[redacted]

From: Valyraki, Kalliopi
Sent: 08 July 2019 11:12
To: Conner, Darryl James [redacted]
Cc: Inkster, Teresa (NHSmail) [redacted]; Peters, Christine [redacted]; Balfour, Alison [redacted]; Hood, John [redacted]
Subject:

Hi Darryl,

As you know Teresa is on annual leave, and I will need to follow up 3 issues at the moment.

1)Validation at PICU. Do you know if this was undertaken and if yes, when will we have the report?

2)Also, do we have any update regarding the investigation of the failed validation at NICU/SCBU?

3)Teresa mentioned, during the weekend, that there is an issue at adult ICU and at 4B. Do you have more information?

A49906791

Thanks,
Pepi

Kalliopi Valyraki
Consultant Microbiologist
Infection Control Doctor
Queen Elizabeth University Hospital
GGC
Tel: [redacted]
Ex. [redacted]

Re: QEUH PICU Report & Option Appraisal

INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)

Tue 13/08/2019 12:54

To:alan.gallacher[redacted]; Devine, Sandra [redacted]; Jamie Minhinnick [redacted]; Steele, Tom [redacted]; Conner Darryl (NHS GREATER GLASGOW & CLYDE) [redacted]; Hill Kevin (NHS GREATER GLASGOW & CLYDE) [redacted];

Cc:Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted];

1 attachment

PICU Report & Options Study (1).doc;

I have made some additions to the document.

There needs to be similar discussion re NICU and SCBU.

Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

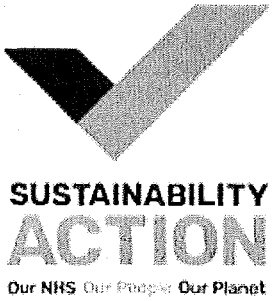
From: Gallacher, Alan [redacted]
Sent: 12 August 2019 13:37
To: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE); Devine, Sandra; Jamie Minhinnick; Steele, Tom; Conner Darryl (NHS GREATER GLASGOW & CLYDE); Hill Kevin (NHS GREATER GLASGOW & CLYDE)
Cc: Purdon Colin (NHS GREATER GLASGOW & CLYDE)
Subject: FW: QEUH PICU Report & Option Appraisal

All,
Have you managed to look at the options within this paper.
We really need to firm this up so that the works associated with it can be carried and a derogation to the SHTM signed off.

Regards,

[redacted]

Alan Gallacher - CEng MIMechE, BEng(Hons), DipEM | General Manager Estates | NHS Greater Glasgow and Clyde | CMB Building | Queen Elizabeth Univerity Hospital | 1345 Govan Road | Glasgow | G51 4TF
t: [redacted] **| internal** [redacted] **| m:** [redacted] **e:** alan.gallacher[redacted]



From: Gallacher, Alan
Sent: 05 August 2019 10:21
To: Inkster, Teresa (NHSmail); Hill, Kevin; Devine, Sandra; Jamie Minhinnick; Steele, Tom; Conner, Darryl James
Cc: Purdon, Colin
Subject: QEUH PICU Report & Option Appraisal

All,
Please find attached the 'draft' QEUH PICU Report and Options Appraisal for your perusal and attention.
The Options Appraisal part of the report needs to be agreed on the way ahead and as such can I ask you for your clinical comments on this so that it can be included in the document.
Once I have had your comments and these have been added can I also suggest that we reconvene a further meeting to discuss the content of same and to agree the sign off of any derogation so that the works associated with the agreed option can be actioned asap.

Regards,

Alan Gallacher - CEng MIMechE, BEng(Hons), DipEM | General Manager Estates | NHS Greater Glasgow and Clyde | CMB Building | Queen Elizabeth Univerity Hospital | 1345 Govan Road | Glasgow | G51 4TF
t: [redacted] **| internal** [redacted] **| m:** [redacted] **e:** alan.gallacher[redacted]

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NHS
Greater Glasgow and Clyde

DRAFT

QEUH PICU VENTILATION REPORT & OPTIONS STUDY

Abstract

Remedial implementations to achieve a compliant and suitable ventilation set up for the current and future patient groups that do & will occupy PICU

Conner, Darryl James
[Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
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G51 4TF
5 August 2019

[Type text]

Contents

Introduction 2
PICU Geographical Boundary Investigation 4
Figure 1 Appendix 1 4
Abstract verification reports with Air Change & door pressure Analysis 5
Figures 2-7 associated PICU ventilation verivication report abstracts. 5
Figure 2 Appendix 2 5
Figure 3 Appendix 2 6
Figure 4 Appendix 2 7
Figure 5 Appendix 2 8
Figure 6 Appendix 2 9
Figure 7 Appendix 2 10
Options Appraisal on All potential Soloutions 11
Option 1 - DO NOTHING 11
Option 2 - REMOVE CVG's 11
Option 3 - Improve Ward Permeability & complete rebalance of Ventilation 11
Option 4 – Re-balance 1 x 4 Critical Care Bedded Area @ +2 pascals 12
Option 5 - Full Compliance to SHTM03-01 Part A 13
Recommendation 13
Appendices 14
Appendix 1 14
Appendix 2 14
Appendix 3 (S-Bar) 14

Deleted: Introduction . 2¶
PICU Geographical Boundary Investigation . 3¶
Figure 1 Appendix 1 . 3¶
Abstract verification reports with Air Change & door pressure Analysis . 4¶
Figures 2-7 associated PICU ventilation verivication report abstracts. . 4¶
Figure 2 Appendix 2 . 4¶
Figure 3 Appendix 2 . 5¶
Figure 4 Appendix 2 . 6¶
Figure 5 Appendix 2 . 7¶
Figure 6 Appendix 2 . 8¶
Figure 7 Appendix 2 . 9¶
Options Appraisal on All potential solutions . 10¶
Option 1 . 10¶
Option 2 . 10¶
Option 3 . 11¶
Option 4 . 11¶
Option 5 ..... 11¶
Recommendation . 12¶
Appendices . 13¶
Appendix 1 . 13¶
Appendix 2 . 13¶
Appendix 3 (S-Bar) . 13¶

Introduction

In order to assess the possible remedial implementations to achieve a compliant and suitable ventilation set up for the current and future patient groups that do & will occupy PICU within the RHC while ensuring that clinicians have the most flexibility possible to place and treat a specific patient group within that space, that is not only compliant with the current guidance standards but supports the level of clinical care achievable within the current design and build I believe key questions must be addressed and answered to achieve the very best result possible.

Based on the recent ventilation verification data of PICU I believe the following questions need to be answered and that estates can only comment on a percentage of, which are:

1. Does the current template for PICU comply with existing guidance within SHTM-03-01 (Part A)?= [redacted]
2. Does the current Air Change Rate for PICU comply with existing guidance within SHTM-03-01 (Part A) and if not can it be made to do so? = [redacted]
3. Does the current pressure cascade for PICU comply with existing guidance within SHTM-03-01 (Part A) and if not can it be made to do so?= [redacted]
4. How are the current Geographical boundaries of PICU interpolated by the clinicians and the Infection control team? [redacted]
5. What is the actual derogated SHTM requirement that would be most suitable to treat the patient groups within the PICU department in reality? [redacted]

Background

PICU underwent validation on the 6th July 2019 and there were a number of non conformances with SHTM 0301

Formatted: Superscript

There is no information available regarding the originial validation , design intent or derogations. The fundamental issue with the design is the insufficient number of isolation rooms available. With an onsite paediatric haemato-oncology unit the percentage of isolation rooms should be ~ 50%. To bring the unit under full compliance with SHTM 0301 would require sufficient isolation rooms . This is unlikely to be technically feasible . The option chosen therefore will be a derogation from SHTM 0301 as a result of derogations at initial planning and design stages, reasons for which are unclear.

Infection control aspects

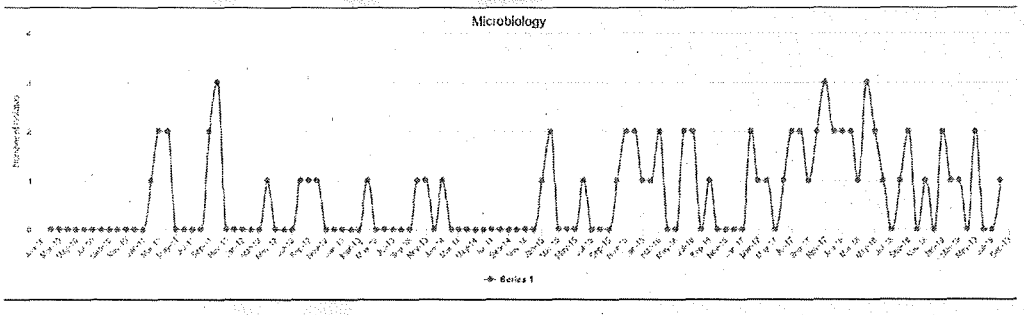
Critical care patients are by definition immunosuppressed. This is due a number of factors which include the severity of underlying illness , invasive procedures, presence of lines, ET tubes, etc. SHTM 0301 acknowledges the need to protect critical care patients by providing a protective environment of 10 ACH and positive pressure of 10 PA. It is also a necessity to provide a further degree of protection for patients who are immunosuppressed or have infectious diseases . This is

delivered via the provision of isolation rooms which can be either positive or negative pressure depending on the clinical requirements. Due to a reduced number of isolation rooms the current strategy within PICU is to cohort patient with the same infectious agent when isolation rooms are not available

Airborne transmission is well documented for pathogens such as tuberculosis, measles, chickenpox. There is also evidence for aerial dissemination of other pathogens such as Staphylococcus aureus and Acinetobacter in the intensive care setting (Beggs et al 2008).

Analysis of local data since the PICU opened reveals no evidence of any outbreaks or cross tranmission of airborne infections such as TB, measles , chickenpox. Similarly there have been no outbreaks of hospital acquired RSV or other respiratory viruses within the unit. Data was extracted from ICNet for all speciment types, deduplicated for the following organisms pre and post move; Klebsiella (all species), Staphylococcus aureus, Stenotrophomonas maltophilia, Acinetobacter(all species) , Serratia (all species) , Pseudomonas (all species).

There appears to be an increase in Acinetobacter (run chart below) .The reason for the Acinetobacter increase is unclear. Investigations via PAGs/IMTs did not identify a source but it is possible that ventilation is a factor. There is a slight increase in Stenotrophomonas possibly related to the recent water incident.



The ventilation strategy adopted moving forward needs to balance the need for protection of the critical ill patient from the surrounding hospital environment but also protection from within the unit itself. Due to the lack of isolation rooms it is likely a hybrid strategy will be required in relation to the 4 bedded bay areas.

PICU Geographical Boundary Investigation

As a result of these questions answered and based on the validation data being of challenging content to procure, a datum line must be established as to how the department is currently set up from a ventilation perspective and what the agreed requirement should be going forward. If we look at Fig 1 which is a layout of the PICU department as a whole, you can see where estates have interpreted the patient areas to be:

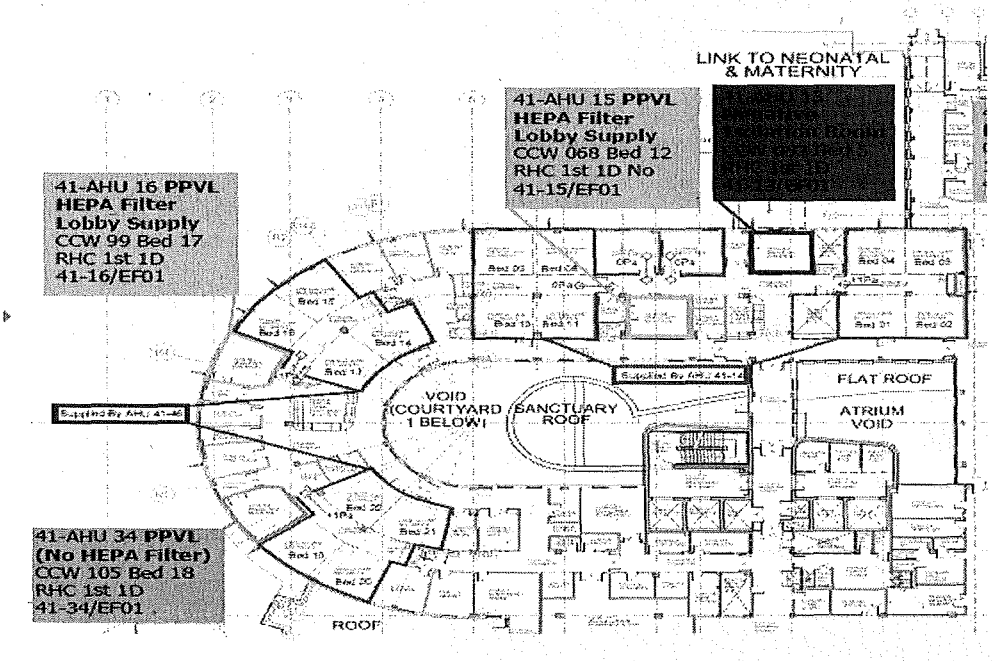


Figure 1 Appendix 1

Highlighted in pink are the 4 four bedded areas and two side rooms, with the grey and red highlighted areas donating the PPVL & negative pressure Isolation rooms.

Abstract verification reports with Air Change & door pressure Analysis

Figures 2-7 associated PICU ventilation verivication report abstracts.

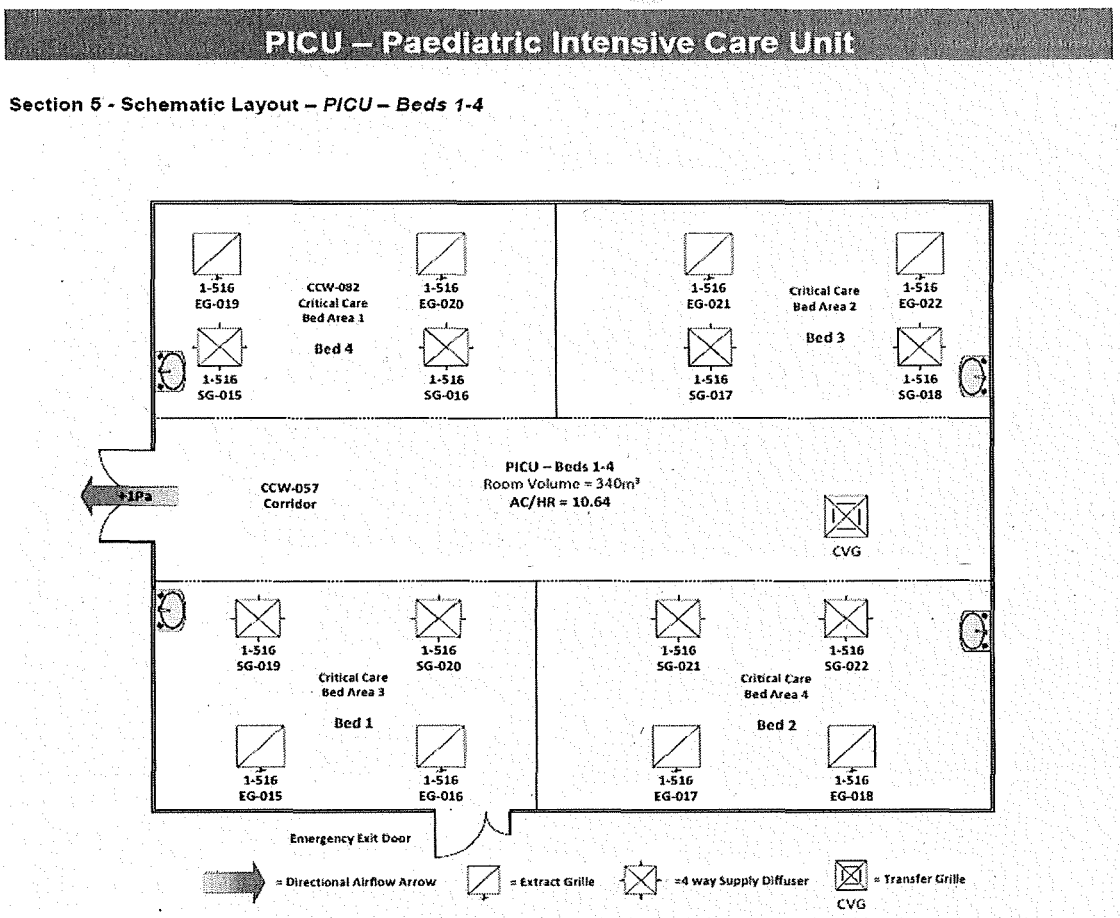


Figure 2 Appendix 2

10.64 ACH & [redacted]

QUEEN ELIZABETH UNIVERSITY HOSPITAL
PICU – Paediatric Intensive Care Unit

Section 5 - Schematic Layout – *PICU – Beds 8-11*

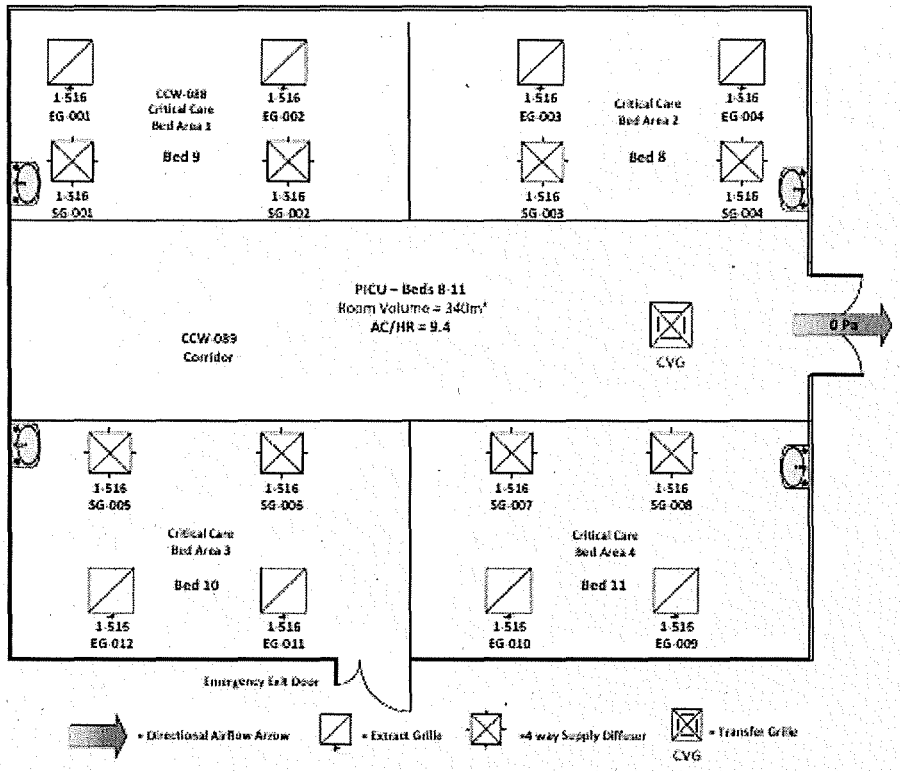


Figure 3 Appendix 2

[redacted] & [redacted]

QUEEN ELIZABETH UNIVERSITY HOSPITAL
PICU – Paediatric Intensive Care Unit

Section 5 - Schematic Layout – *PICU – Beds 13-16*

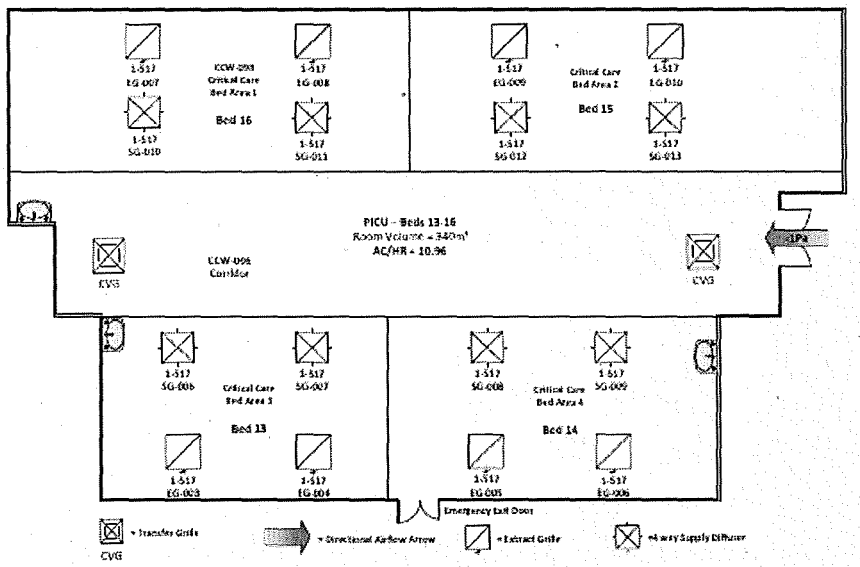


Figure 4 Appendix 2

[redacted] & [redacted]

QUEEN ELIZABETH UNIVERSITY HOSPITAL
PICU – Paediatric Intensive Care Unit

Section 5 - Schematic Layout – *PICU – Beds 19-22*

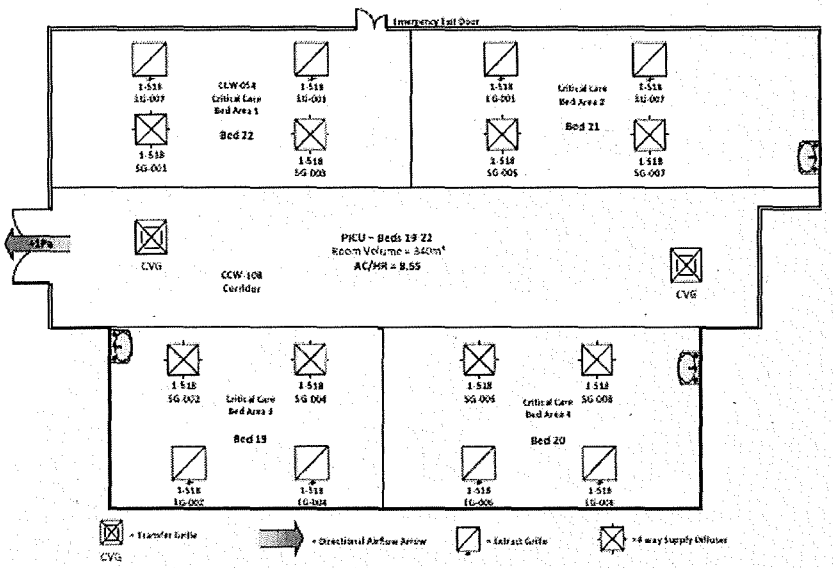


Figure 5 Appendix 2

[redacted] &

- Adobe Acrobat Reader DC

20 / 25 66.7%

Correct air SOLUTIONS LTD

QUEEN ELIZABETH UNIVERSITY HOSPITAL
PICU – Paediatric Intensive Care Unit

Section 5 - Schematic Layout – *PICU – Bed 7*

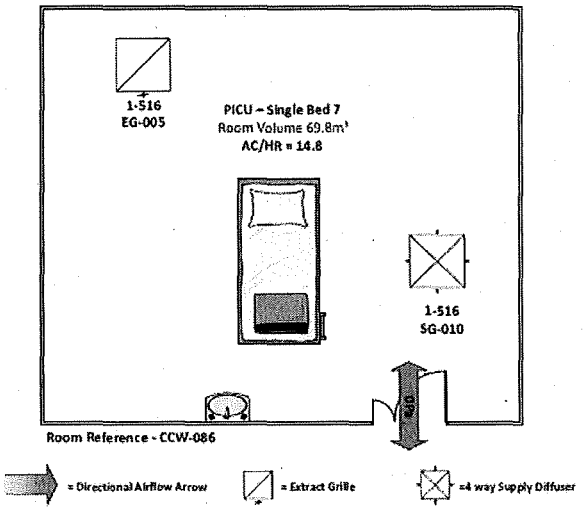


Figure 6 Appendix 2

[redacted] & [redacted]

QUEEN ELIZABETH UNIVERSITY HOSPITAL
PICU – Paediatric Intensive Care Unit

Section 5 - Schematic Layout – *PICU – Bed 8*

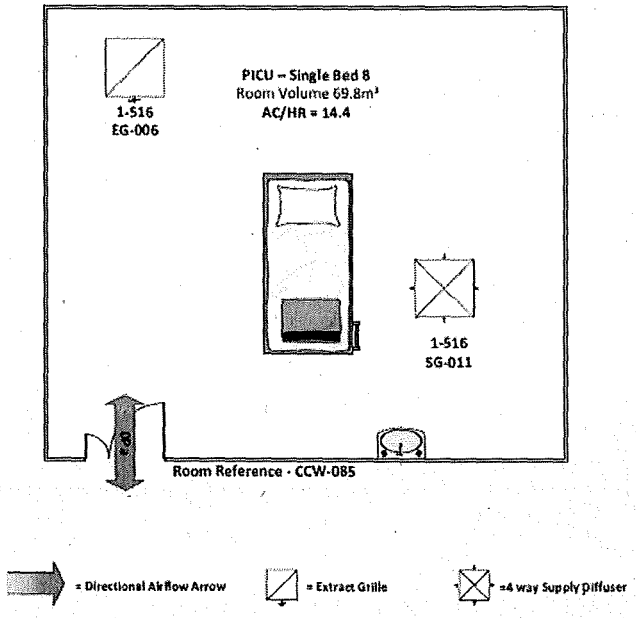


Figure 7 Appendix 2

14.4 ACH & [redacted]

Based on the recent ventilation verification and subsequent investigations, it is clear that the patient areas previousley highlighted in pink show air changes within compliance but close to ambient or negative pressure cascades as per figures 2-7. This would initially support the hypothesis that the design intent was to consider the whole department as a CCU and that the external ward entrances should be of positive pressure to the dirty corridors. Further investigation has shown that the air change rate within the corridors is 0.8 per hour, as this is below the standard of a CCU or that of a general ward, then the perception is formed that just the patient areas are the intended to be of CCU standard and that they could and should be moddified to comply with the guidance for a criticaly ventilated space.

Options Appraisal on All potential Soloutions

Based on the above overview the following options have been derived;

Option 1 - DO NOTHING

Advantages:

1. Maintain the current ACH rates as per the recent ventilation verification.
2. No disruption to Ward.
3. No Cost.

Disadvantages:

1. PICU not compliant to SHTM03-01 Part A
2. Risk of future outbreaks related to ventilation

Option 2 - REMOVE CVG's

Remove Ceiling Ventilation Grills (CVG's) only.

Advantages:

1. Maintain the current ACH rates as per the recent ventilation verification.
2. Lowered risk of dust ingress.
3. Low cost solution.

Disadvantages:

2. Disruption to the ward in removing the CVGs;
3. PICU not compliant to SHTM03-01 Part A
4. Risk of future outbreaks related to ventilation

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Option 3 - Improve Ward Permeability & complete rebalance of Ventilation

Protect each patient occupied bed space to the Ward standard of the SHTM03-01, which is 10 ACH and 10 Pascal from any CCU department to dirty corridor. This can be achieved by removal of CVGs for a ceiling tile, pinning the existing suspended ceiling, seal the IPS columns & adjust the door gaps while fitting draft excluder drop downs if and when required with a turnaround time of three days per 4 bedded area. This will significantly improve the room's permeability and ability to rebalance the plant in order to achieve design. Dirty utilities & prep rooms would also be included within this exercise so not to impede the established regimes of the patient areas.

Advantages:

1. Maintain & improve the current ACH rates as per the recent ventilation verification.
2. Establish Positive 10 pascal positive barriers from each room to corridor.
3. Achieve a more protective facility and closer intent to SHTM03-01 Part A.

Disadvantages:

1. Ward disruption via closure of one 4 bedded area per 3 days until completion of works. Approx 12 days in total.
2. PICU not compliant to SHTM03-01 Part A.
3. High cost
4. Risk of future outbreaks due to cohorting of patients who would normally be isolated in a room with 10 pascal positives

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Option 4 – Re-balance 1 x 4 Critical Care Bedded Area @ +2 pascals Remove CVG's

Implement **option two** for specific 4 bedded areas: 8-22 & Single rooms CCW-086 & CCW-085 chosen by clinicians and IC, with the remaining patient 4 bedded room 1-4 rebalanced to achieve the compliant Air change rate while having a positive 2 pascal pressure cascade from room to corridor, this can be achieved by modifying the extract rates to reduce pressure while maintaining 10 ACH per hour and the standard for particulate dilution. Dirty utilities & prep rooms would also be included within this exercise so not to impede the established regimes of the patient areas.

Advantages:

1. Maintain & improve the current ACH rates as per the recent ventilation verification.
2. Allows for the establishment of defined patient group tailored Positive barriers for the specific areas highlighted by Infection Control for each room to corridor.
3. Achieve a more protective & bespoke facility with agreed derogation from the SHTM03-01 Part A.

Disadvantages:

1. Ward disruption via closure of 1x 4 Critical Care bedded area for 3 days until completion of works.
2. PICU not compliant to SHTM03-01 Part A.
3. Capacity issue for cohorting of patients with infections may be reduced which may result in outbreaks

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Option 5 - Full Compliance to SHTM03-01 Part A

Implement **option two** for all patient areas, and in addition measure the air permeability of all adjacent corridors and rooms within the perceived PICU department, this information in parallel with corridor velocity measurements will create a value for any natural ventilation effect which could be added to the already measured 0.8 ACH measured from the existing plant serving the surrounding areas. The result in this exercise may support the requirement for the installation of an additional AHU to supply the surrounding non patient areas as the existing plant serving the corridor is already running at capacity, this would involve significant disruption to service and capital investment to achieve full compliance with SHTM03-01 guidance.

Advantages:

1. Fully SHTM03-01 Part A compliant PICU facility.

Disadvantages:

1. Full Closure of the department.
2. Significant building fabric & M&E upgrades.
3. Not suitable for differing Patient types using this facility (see SBAR) due to the lack of sufficient isolation rooms.
4. High Cost

Deleted: .

Recommendation

Option 4 would be the preferred option given the complexity of patient type for this area based on the S-Bar produced by the ICT on patient types and the requirement of the service to meet the needs of these patients. With an agreed 'derogation' to the SHTM03-01 Part A guidance, signed off by the AE(V), ICT and the respective Service Lead, this will achieve a compliant and suitable ventilation set up for the current and future patient groups that do & will occupy PICU within the RHC while ensuring that clinicians have the most flexibility possible to place and treat a specific patient group within that space.

Appendices

Appendix 1

Adobe Acrobat Document

Appendix 2

Adobe Acrobat PDFXML Document

Appendix 3 (S-Bar)

Microsoft Word Document

RE: PICU ventilation

Davidson, Mark <Mark.Davidson3[redacted]

Tue 13/08/2019 13:24

To:INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted];

Cc:neil.spenceley[redacted]; Meechan Mandy (NHS GREATER GLASGOW & CLYDE) [redacted]; TURNER, Alastair (NHS GREATER GLASGOW & CLYDE) [redacted]; McPherson, Liane [redacted];

Many thanks for the email Teresa

Mandy & I ran the "Move" project from a PICU & Ward 1e perspective so we are more than happy to input into the process. I have cced in Mandy as well as Neil (CD for PICU 7 Anaesthetics) and Liane McPherson (PICU Nurse in charge)

There were several issues we raised with the project team, including hepafiltration, in order to ensure we were adequately set for use as a busy multi-speciality PICU. We did not sign off clinically on many of the build issues and this was raised with the management and project teams. Ventilation and air flow of the 4bed bays etc was not addressed by the clinical team.

The PICU team would be keen to be part of any decision making process round the solutions put in place for the issues highlighted in the report. I have shared this with Neil, Mandy & Liane as well.

Kind regards

[redacted]

Dr Mark Davidson

Consultant Paediatric Intensivist, Royal Hospital for Children, Glasgow
Honorary Clinical Senior Lecturer, School of Medicine, Dentistry and Nursing, University of Glasgow

Paediatric Intensive Care Glasgow

Paediatric Extracorporeal Life Support Glasgow

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]
Sent: 13 August 2019 08:45
To: Davidson, Mark; TURNER, Alastair (NHS GREATER GLASGOW & CLYDE)
Subject: [ExternaltoGGC]PICU ventilation

Dear both,

A49906791

Whilst I was on annual leave recently validation reports were issued for PICU ventilation. The reports have been rated Poor, due to deviation from SHTM 0301, which is the national guidance document for ventilation specification.

My colleague Christine Peters attended a series of meetings with estates and hospital management to discuss and produced the attached SBAR

Subsequently there has been an options appraisal document produced , also attached

It is crucial that there is clinical input in the decision made as to which option we recommend.

Would either of you be free to meet with me to discuss?

I also wondered if any of you had been involved in the original design of the unit and whether the ventilation strategy we have was an agreed derogation , perhaps for a clinical reason?

Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

Re: Derogation Form - QEUH PICU

Davidson, Mark <Mark.Davidson3[redacted]>

Wed 18/09/2019 21:20

To: alan.gallacher[redacted];

Cc: Conner Darryl (NHS GREATER GLASGOW & CLYDE) [redacted]; Steele, Tom [redacted]; Riddell Mark (NHS GREATER GLASGOW & CLYDE) [redacted]; neil.spenceley[redacted]; INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]; Jamie Minhinnick [redacted]; Devine, Sandra [redacted]; Bowskill Gillian (NHS GREATER GLASGOW & CLYDE) [redacted]; Rodgers Jennifer (NHS GREATER GLASGOW & CLYDE) [redacted]; Hutton Melanie (NHS GREATER GLASGOW & CLYDE) [redacted]; Rolls Gael (NHS GREATER GLASGOW & CLYDE) [redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted]; brian.jones[redacted]; Hill Kevin (NHS GREATER GLASGOW & CLYDE) [redacted];

Thank you Alan & Daryl
What evidence do we have to support this derogation is adequate in terms of air flow other than clinical and engineering judgement?
Can I be clear what works were undertaken to the "emergency exit" door from the 4BB to stop them being used routinely?
What evidence do we have that we are not pushing any viruses etc into the corridors where patients and families pass through?
I note that bed 18 doesn't have a hepafilter in the ante-room - this room has been used for haem-oncology patients which I assume it should not be.
We should to get this grow filtered as soon As possible to aid flexibility if picu bed spaces.
Thank you
Kind regards
Mark

Sent from my iPhone

On 18 Sep 2019, at 17:49, Gallacher, Alan [redacted] wrote:

> All,
> I've attached a **derogation form** for your comments. It is important that this is approved asap to allow governance and compliance of this area to be taken forward.
> Can you review asap and return comments.
> I would like to get this signed off tomorrow and before the meeting on Monday so your comments will be appreciated.
>
> Regards,
>
> <image004.png>
> **Alan Gallacher - CEng MIMechE, BEng(Hons), DipEM | Head of Corporate Estates | NHS Greater Glasgow and Clyde | CMB Building | Queen Elizabeth Univerity Hospital | 1345 Govan Road | Glasgow | G51 4TF**
> **t: [redacted] | internal [redacted] | m: [redacted] | e-mail:**
> **alan.gallacher[redacted]**
>
> <image003.png>
>
> **Think SAFE ENVIRONMENT.. ....please help cut carbon.....don't print this email unless you really have to.....and remember to recycle.....SAVE ENERGY - THE EASY WAY TO SAVE MONEY!**
>
> <PICU Derogation - Ventilation.pdf>

A49906791

RE: PICU Bed Space 1-4/Options Study

Conner, Darryl James <DarrylJames.Conner[redacted]

Thu 19/09/2019 16:12

To: alan.gallacher[redacted]; neil.spenceley[redacted];

Cc: Devine, Sandra [redacted]; INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]; Bowskill Gillian (NHS GREATER GLASGOW & CLYDE) [redacted]; Rodgers Jennifer (NHS GREATER GLASGOW & CLYDE) [redacted]; Hutton Melanie (NHS GREATER GLASGOW & CLYDE) [redacted]; Rolls Gael (NHS GREATER GLASGOW & CLYDE) [redacted]; Davidson Mark (NHS GREATER GLASGOW & CLYDE) [redacted]; Steele, Tom [redacted]; Riddell Mark (NHS GREATER GLASGOW & CLYDE) [redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted]; Jamie Minhinnick [redacted]; 'Ian McKenzie' [redacted];

1 attachment

RHC-PICU Beds 1-4 Validation 15 Sep 2019.pdf;

Hi All,

Please see the official ventilation report generated by Ian McKenzie of Correct Air Solutions post fabric and balancing modifications to PICU bed space 1-4.

As a result should this Mondays meeting prove successful and everyone concerned is in agreement that the now chosen and proven derogated SHTM regime established is acceptable and with all relevant parties signing off on the derogation document submitted yesterday by Alan Gallagher, then the serial no of his derogation document will be added to Ian's ventilation report document reflecting that this report is a validation document with an associated derogation number, then the report will have the required authenticity and will set the official standard for this space to be verified to in the future.

Best

Regards
Darryl

Darryl James Conner MIET MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conner[redacted]

A49906791

From: Gallacher, Alan
Sent: 19 September 2019 08:49
To: Spenceley, Neil [redacted]>
Cc: Conner, Darryl James [redacted]; Devine, Sandra [redacted]; Inkster, Teresa (NHSmail) [redacted]; Bowskill, Gillian [redacted]; Rodgers, Jennifer [redacted]; Hutton, Melanie [redacted]; Rolls, Gael [redacted]; Davidson, Mark [redacted]; Steele, Tom [redacted]; Riddell, Mark [redacted]; Purdon, Colin [redacted]; Jamie Minhinnick [redacted]
Subject: RE: PICU Bed Space 1-4/Options Study
Importance: High

Neil et al,
Happy to discuss at the meeting.
A planned approach will be required between estates, ICT and the service similar to the work carried out for Bed Spaces 1-4.

Regards,

[redacted]

Alan Gallacher - CEng MIMechE, BEng(Hons), DipEM | Head of Corporate Estates | NHS Greater Glasgow and Clyde | CMB Building | Queen Elizabeth Univerity Hospital | 1345 Govan Road | Glasgow | G51 4TF
t: [redacted] **| internal** [redacted] **| m:** [redacted] **| e-mail:** alan.gallacher[redacted]

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Our NHS Our People Our Planet

Think SAFE ENVIRONMENT.. ....please help cut carbon.....don't print this email unless you really have to.....and remember to recycle.....SAVE ENERGY - THE EASY WAY TO SAVE MONEY!

From: Spenceley, Neil
Sent: 18 September 2019 12:25
To: Gallacher, Alan
Cc: Conner, Darryl James; Devine, Sandra; Inkster, Teresa (NHSmail); Bowskill, Gillian; Rodgers, Jennifer; Hutton, Melanie; Rolls, Gael; Davidson, Mark; Steele, Tom; Riddell, Mark; Purdon, Colin; Jamie Minhinnick
Subject: Re: PICU Bed Space 1-4/Options Study

Thanks

I'm at another meeting in the TLC but could maybe pop out.

I'm assuming that we only need this to proceed with the the next phase and we can reopen once we have the IC clearance?

Thanks,

Neil

On 18 Sep 2019, at 12:07, Gallacher, Alan [redacted] wrote:

> All,
> Can I have your availability for this meeting to take place so that the Options Study and derogation paperwork can be signed off and for the work to address the remainder of PICU can commence.
> Availability in my diary is probability as limited as yours, however can you confirm that **Monday 23rd @ 1030hrs** at CMB is a suitable time/place for you.
> I will send out a diary invite and paperwork.
>
> Regards,
>
> <image004.png>
> **Alan Gallacher - CEng MIMechE, BEng(Hons), DipEM | Head of Corporate Estates | NHS Greater Glasgow and Clyde | CMB Building | Queen Elizabeth Univerity Hospital | 1345 Govan Road | Glasgow | G51 4TF**
> **t: [redacted] | internal [redacted] | m: [redacted] | e-mail: alan.gallacher[redacted]**
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>
> **Think SAFE ENVIRONMENT.. ....please help cut carbon.....don't print this email unless you really have to.....and remember to recycle.....SAVE ENERGY - THE EASY WAY TO SAVE MONEY!**

From: Conner, Darryl James
Sent: 16 September 2019 11:40
To: Devine, Sandra; Inkster, Teresa (NHSmail); Bowskill, Gillian; Rodgers, Jennifer; Hutton, Melanie; Rolls, Gael
Cc: Steele, Tom; Gallacher, Alan; Riddell, Mark; Purdon, Colin
Subject: PICU Bed Space 1-4

Good Morning all,

I would like to update you all on the successful completion of the PICU Bed Space 1-4 fabric and ventilation improvements, I can confirm that the air permeability and fabric enhancements where delivered and returned back to the clinicians control last night after the agreed 4 day time period as originally proposed, the improvements where of such significance that we have now actually had to trim the ventilation back to achieve the verbally derogated 10.64 ACHS/hour and 2 pascals positive pressure barrier from bed space to corridor that was verbally discussed and agreed prior to the works commencing. This will prove extremely beneficial for the facility's ventilation regime longevity and plant stability.

I would like to propose that we have a meeting this week with all relevant parties to formally agree and sign off this derogation from SHTM03-01 to authenticate this validation documentation and set the standard for this part of the facility to be verified to annually for here on out.
I would also like to discuss the availability of the next 4 bedded area to be improved in order to maintain the momentum and continuity of this important work.

Thanks
Best

P.S Can I ask you all to forward this information to any leads or relevant parties that I may have missed.

Regards

Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conne[redacted]

A49906791

tion Form - QEUH PICU

arryl James <DarrylJames.Conner[redacted]

09/2019 17:13

Davidson Mark (NHS GREATER GLASGOW & CLYDE) [redacted]; alan.gallacher[redacted]
[redacted];

Steele, Tom [redacted]; Riddell Mark (NHS GREATER GLASGOW & CLYDE) [redacted];
neil.spenceley[redacted]; INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
[redacted]; Jamie Minhinnick [redacted]; Devine, Sandra
[redacted]; Bowskill Gillian (NHS GREATER GLASGOW & CLYDE) [redacted];
Rodgers Jennifer (NHS GREATER GLASGOW & CLYDE) [redacted]; Hutton Melanie (NHS GREATER
GLASGOW & CLYDE) [redacted]; Rolls Gael (NHS GREATER GLASGOW & CLYDE)
[redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted];
brian.jones[redacted]; Hill Kevin (NHS GREATER GLASGOW & CLYDE)
[redacted];

Mark,

derstood in response to your questions:

hat evidence do we have to support this derogation is adequate in terms of air flow other than clinical and gineering judgement?

clarify estates/engineering support and evidence is with respect to if the requested derogation can be achieved under e current system parameters with the recommended carried out modifications to the space.

n I be clear what works were undertaken to the "emergency exit" door from the 4BB to stop them being used utinely?

e works undertaken on the emergency exit door where to reduce the air gaps and improve the permeability of the om in its entirety, routine use should be mitigated by staff facility awareness and signage.

hat evidence do we have that we are not pushing any viruses etc into the corridors where patients and families pass rough?

ection control should provide you with this reassurance based on the choice of derogation ,Patients with contagious uses should not be in this type of clinical facility.

ote that bed 18 doesn't have a hepafilter in the ante-room - this room has been used for haem-oncology patients ich I assume it should not be.

ection Control would need to review this area and negative pressure validation documentation for suitability and rpose of usage.

should to get this grow filtered as soon As possible to aid flexibility if picu bed spaces.

above.

st

egards

Darryl

Darryl James Conner MIET MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conner[redacted]

Thank you
Kind regards
Mark

From: Davidson, Mark
Sent: 18 September 2019 21:21
To: Gallacher, Alan [redacted]
Cc: Conner, Darryl James [redacted]; Steele, Tom [redacted]; Riddell, Mark [redacted]; Spenceley, Neil [redacted]; Inkster, Teresa (NHSmail) [redacted]; Jamie Minhinnick [redacted]; Devine, Sandra [redacted]; Bowskill, Gillian [redacted]; Rodgers, Jennifer [redacted]; Hutton, Melanie [redacted]; Rolls, Gael [redacted]; Purdon, Colin [redacted]; Jones, Brian [redacted]; Hill, Kevin [redacted]
Subject: Re: Derogation Form - QEUH PICU

Thank you Alan & Daryl
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Thank you
Kind regards
Mark

Sent from my iPhone

On 18 Sep 2019, at 17:49, Gallacher, Alan [redacted] wrote:

> All,
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> Can you review asap and return comments.

A49906791

I would like to get this signed off tomorrow and before the meeting on Monday so your comments will be appreciated.

Regards,

<image004.png>

Alan Gallacher - CEng MIMechE, BEng(Hons), DipEM | Head of Corporate Estates | NHS Greater Glasgow and Clyde | CMB Building | Queen Elizabeth Univerity Hospital | 1345 Govan Road | Glasgow | G51 4TF
t: [redacted] | internal [redacted] | m: [redacted] | e-mail:
alan.gallacher[redacted]

<image003.png>

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<PICU Derogation - Ventilation.pdf>

QEUH Isolation Room Steering Group

Conner, Darryl James <DarrylJames.Conner[redacted]

Wed 15/05/2019 14:44

To: Steele, Tom [redacted]; INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]; alan.gallacher[redacted] [redacted]; Connelly Karen (NHS GREATER GLASGOW & CLYDE) [redacted];

Cc: Dodd Susan (NHS GREATER GLASGOW & CLYDE) [redacted]; Pritchard Lynn (NHS GREATER GLASGOW & CLYDE) [redacted]; French, Sofie [redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted]; Powrie Ian (NHS GREATER GLASGOW & CLYDE) [redacted]; Clarkson, Kerr [redacted]; Guthrie James (NHS GREATER GLASGOW & CLYDE) [redacted]; Riddell Mark (NHS GREATER GLASGOW & CLYDE) [redacted];

Hi All,

I am looking to initiate a monthly "Isolation Room Steering Group meeting" primarily for the QEUH at the request of Teresa and Tom to discuss all aspects of the QEUH campus's isolation room assets. The aim for topic of discussion would encompass:

1. Verification report analysis
2. Asset Familiarity- PPVL, PPIR, BMT, negative pressure facilities etc.
3. SOPs for remedial actions
4. HAI Scribe discussion with relation to associated remedial works
5. Annual verification schedules
6. Plant failure contingency plans
7. Future projects

If anyone would like to add other topics for discussion with regards to Isolation rooms, suggest any other contacts to invite to the meeting this would be greatly appreciated!
Once I get a feel for the numbers and overall content for the meeting, I will finalise a location and agenda for discussion. If there are no objections I would like to aim to have the first meeting for the last Friday this month which will be the 31st of May 2019 and all subsequent meetings on the last Friday of each month thereafter, this date is flexible pending over all availability.

Thanks
Best

Regards
Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
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G51 4TF

Tel: [redacted]06791

Mob: [redacted]
Email: Darryljames.conner[redacted]

Specialist Critical ventilation Steering Group

Date: Friday 24th June 2019 @ 10.00 am
Venue: Labs Room 5

AGENDA

1. Apologies
2. Approval of Minutes
3. Action Points
4. Verification report analysis
5. Asset Familiarity- PPVL, PPIR, BMT, negative pressure facilities etc.
6. SOPs for remedial actions
7. HAI Scribe discussion with relation to associated remedial works
8. Annual verification schedules
9. Plant failure contingency plans
10. Future projects
11. AOB

Actions and Updates from previous meeting

Actions for Estates to be completed by next meeting 24/06/2019 :

Submission of new critical ventilation verification schedules. Complete

Submission to IC of an accurate and inclusive isolation room list including all PPVL, PPIR, BMT, negative pressure facilities. Complete

Submission of all Adults Isolation room verification reports. Complete Apart from 2 outstanding reports.

Installation of facility ID plaks adjacent to each Mag gauge stipulating Type and Terminal HEPPA status. Infection control to Advise

Extension of group meeting invite to MRI (Mary Peary), ITU/HDU (Ian Thompson), Endoscopy (Alyson Goodwin) Interventional Radiology (Gary Gracin) HFS (Ian Storer). Complete.

Clarification of who the group should report to Tom Steel to advise.

IC have requested that estates answer the information requests stated on Appendix 1 & 2 of the attached HFS report done in 2016, with the intention of asking HFS to come back and generate a similar report based on the ever changing use of these facilities. Tom Steel has advised that this Group is not to review previous reports.

Actions for IC by next meeting 24/06/2019 :

Submission to Estates all recorded chilled beam leakage incidents for M&E analysis .Not provided yet
PPVL Plak wording to be confirmed. Not provided yet

Date of next meeting :

TBA ,

Re: Isolation room verification reports

INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)

Tue 28/05/2019 16:10

To: Conner Darryl (NHS GREATER GLASGOW & CLYDE) [redacted]

Cc: Steele, Tom [redacted]; alan.gallacher [redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted]

1 attachment

2016-06-29 QEUH isolation rooms report d0 05 (8).pdf;

Thanks Darryl

There were a few of the rooms I had concerns about, this was just the example I picked. It would be useful to spend time at the meeting going over them all. I only have reports for RHC. Is it possible to get reports for the QEUH rooms as well?

Whilst we now have negative pressure rooms for infectious patients we are still using these PPVLs for immunosuppressed patients for which there was an exclusion in the guidance . Cracks in the fabric and holes can be an issue depending on the extent as the premise for these rooms is that they are sealed.

It would also be useful to discuss how many of the remainder were built with modifications on the orginal design and whether there is anything we can do about that. I note a latent defect in this particular report.

I have attached the HFS report into these rooms for discussion on Friday

It would also be useful for this group to review the other specialist ventilated areas such as interventional radiology, endoscopy, pacemaker rooms etc.

Ian Powrie had drafted an annual verification SOP, it would be useful to look at that also

Thanks
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow

Direct dial : [redacted]

From: Conner, Darryl James [redacted]
Sent: 23 May 2019 18:28
To: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Cc: Steele, Tom; alan.gallache[redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE)
Subject: Isolation room verification reports

Hi Teresa,

Tom has asked me to contact you regarding your concerns for a particular isolation room verification report :

RHC Ward 2C - Isolation Room 5

The report itself shows the facility in a poor condition, I believe the obvious questions are:

1. Why has the room been signed off and handed back for use?
2. Is the particular patient group occupying the space at risk based on the reports poor rating of the suites condition?

To explain why the facility is fit for purpose and does meet the requirements of the SHTM04 Sup 1, the individual components of the report must be assessed and risk assessed against the current guidance which reads as follows:

Section 2 – Definition of terms
Assessment of compliance with SHPN 04 Supplement 1

Poor
Air volumes and hence air-change rate is less than 75% of the design. Room pressure differentials do not ensure a flow from clean to less clean areas; supply or extract air diffusers are not clean; pressure stabilisers not clean and/or not operating correctly; visible faults in the fabric of the suite; doors unable to close completely; general air of neglect.
Action: Urgent management action required.

Average
Air volumes and room pressure differentials approximate to the original design values; supply air diffusers clean but extracts visibly fouled; most pressure stabilisers clean and operating correctly; minor faults in the fabric and decor of the suite.
Action: Maintenance action required.

Good
Better than average.
Action: None.
Maintenance quality

Poor
More than three answers are negative.
Action: Management action required by estates/facilities department.

Average
No more than three answers are negative
Action: Maintenance action required.

Good
No answers are negative.
Action: None.

The report for this room shows a non-favourable poor grading due to " More than three answers are negative" and **not** because "Air volumes and hence air-change rate is less than 75% of the design and that Room pressure differentials do not ensure a
flow from clean to less clean areas"

This can be viewed in the adjacent abstract from the attached verification report:

11	Measure and record the supply and extract air flow in the principle ducts		X	Fire rated duct test points covered with fire rated duct covers
12	Measure and record the air flow at all supply and extract terminals	✓		
13	Does the supply air meet the required minimum air change rate in the lobby (63AC/HR)		X	61.9 ACR
14	A positive pressure between 10 & 12Pa is achieved between the entry lobby and the corridor;		X	16Pa

Item 11 is a latent defect from building handover so automatically compromises the suites ability to achieve a good rating.
The ACH rates in two instances actually exceed design (values 14.8 & 10.6) and in the other instance for the lobby is well within 75% of design (61.9) as shown adjacent :

Section 5 – Supply & Extract Airflow Rates & Air Change Rates

Isolation Room 5 – AHU Ref.: 41AHU38					
Room Reference	**Design Volume l/s-m³/Hr**	**Recorded Air Volume m³/Hr**	**Room Volume m³**	**Recorded AC/HR**	**SHPN ACRs (AC/HR)**
Lobby (Supply)	300 - 1080	1089	17.58	61.9	63.0
Bedroom (Extract)	185 - 666	623	42.22	14.8	>10
En-Suite (Extract)	45 - 162	148	13.93	10.6	>10
Comments: Low air change rates were recorded in the lobby.					

The other factor that caused the rating to be poor on the report was the lobby pressure being out of spec at 16pa for room 5, this was caused by the adjacent suite undergoing its negative pressure conversion (Room 6), during that period and then being returned back to PPVL when the space was not achieving design in its negative state, the outputs for these rooms where crossed over thus giving the false reading, this is now being addressed to reflect the true difference between both facility's. As a result of this and the completion of these works I expect the next verification of this space to be much more favourable as the items pulling the grading down will have been addressed.

Section 3 - Executive Summary/Observations:

- **The air change rate recorded in the lobby is low.**
- **The bedroom air change rate is above the minimum level.**
- **The lobby pressure is out of specification (16Pa)**
- **Magnehelic gauge is not wired into the BMS system so alterations cannot be made to bring the room pressure back into specification.**
- **The room temperature is within specification.**
- **Hole in Vinyl in the Bedroom**
- **Crack in the ceiling in the Lobby**

To summarise the fundamental requirements of a PPVL room were achieved, that being 10 ACHs or more and the correct pressure cascade established to ensure patient protection for PPVL application. The report rating shows the facility in a black and white manner and is scored as per the current guidance. I believe These reports can be improved and more detailed, there for as an initiative I have now implemented the change of specialised contractor conducting these verifications on our behalf with a clear remit to address all concerns regarding these important facility's, this will contribute to faster report completion time and remedial work turn around based on any advisories stated within the report, and overall more detailed finalised reports improving our understanding of the condition of our assets.

Hopefully I have been able to highlight the interpretation of these isolation room verification reports and the classification they can be given due to the high standards that they are validated and subsequently annually verified to. These are all topics that we can discuss at our newly established Isolation room steering group (Invites out tomorrow for 31/05/2019) in the interim I am happy to assist and discuss any and all questions you may have regarding the subject.

Best

Regards
Darryl

Darryl James Conner MIHEEM

Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
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G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conner[redacted]

Re: Actions

INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)

Tue 25/06/2019 11:04

To:Conner Darryl (NHS GREATER GLASGOW & CLYDE) [redacted]; Peters Christine (NHS GREATER GLASGOW & CLYDE) </o=MAIL/ou=NHSFB01/CN=Recipients/CN=ZLGFFYKV>;

Hi Darryl

see below

QEUH

PPVL ICU Rooms 23,40,50
PPVL 4A renal, rooms 43,34

Interventional radiology (not interventional vascular theatres)
CCU pacing room
MRI
CT scanning
ED decontamination room
ICU 1-4
HDU 2,5,6

RHC

Cardiac cath
Interventional radiology
NICU
SCBU
Aseptic pharmacy

Thanks
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

m: Conner, Darryl James [redacted]
Sent: 25 June 2019 10:21
To: Peters Christine (NHS GREATER GLASGOW & CLYDE); INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Subject: RE: Actions

Hi,

Can you please send over the list of the requested outstanding verification reports and I will get them sent over to you for review.

Best

Regards
Darryl

Darryl James Conner MIHEEM
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G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conner[redacted]

From: Peters, Christine
Sent: 25 June 2019 10:18
To: Conner, Darryl James [redacted]; Inkster, Teresa (NHSmail) [redacted]
Subject: RE: Actions

Thanks!

From: Conner, Darryl James
Sent: 24 June 2019 16:05
To: Peters, Christine; Inkster, Teresa (NHSmail)
Subject: RE: Actions

Hi Christine,

No problem, please see attached.

Regards
Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
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Labs Bldg.
1345 Govan Rd
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G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conne[redacted]

From: Peters, Christine
Sent: 24 June 2019 12:31
To: Conner, Darryl James [redacted]; Inkster, Teresa (NHSmail) [redacted]
Subject: Actions

Hi Darryl,

I wonder if you would be able to circulate the action points from the last meeting as the print copy is hard to read,

KR

Christine

Dr Christine Peters
Consultant Microbiologist
Queen Elizabeth University Hospital,
GGC
Ex [redacted]
Mobile: [redacted]

Re: Outstanding verification reports (Actions)

INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)

Tue 02/07/2019 12:45

To:Conner Darryl (NHS GREATER GLASGOW & CLYDE) [redacted]; Peters Christine (NHS GREATER GLASGOW & CLYDE) [redacted]; Pritchard Lynn (NHS GREATER GLASGOW & CLYDE) [redacted]; Dodd Susan (NHS GREATER GLASGOW & CLYDE) [redacted];

Cc:Steele, Tom [redacted];

Thanks Darryl

So still outstanding are ;

RHC- PICU

QEUH - renal rooms 43 and 44
-MRI
-CT scan
- ED decon rooms
- ICU 1-4
- HDU 2,5,6

At first glance of these reports the ones that concern me are NICU and SCBU

They have validated NICU against a SCBU and not a critical care area. As per SHTM 0301 NICU should be air changes of 10 and pressure of +10PA. I think we need to ask them to reissue the report on that basis

Also concerned that SCBU despite having pressures that are negative is rated as Average. It would be highly unlikely that SCBU has negative pressure rooms by design and they are not being used as such

I need some more time to look at all of these reports and will send a more detailed summary over the next few days regarding SCBU and NICU, but wanted to alert you to these areas as being non compliant

Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology

Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

From: Conner, Darryl James [redacted]
Sent: 01 July 2019 16:05
To: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE); Peters Christine (NHS GREATER GLASGOW & CLYDE); Pritchard Lynn (NHS GREATER GLASGOW & CLYDE); Dodd Susan (NHS GREATER GLASGOW & CLYDE)
Subject: Outstanding verification reports (Actions)

Hi All,
Here are the verification reports discussed from our recent meeting.

Regards

Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conne[redacted]

Concerns

Conner, Darryl James [redacted]

Tue 02/07/2019 16:32

To:INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted];

Hi Teresa,

RHC- PICU – Estates are currently in discussions today with getting access to here to carry out verification.

QEUH - renal rooms 43 and 44 – Estates to organise access dates. Dates TBC
-MRI - Estates to organise access dates. Dates TBC
-CT scan- Estates to organise access dates. Dates TBC
- ED decon Estates to organise access dates. Dates TBC
- ICU 1-4 – rectification work ongoing due to issues found during verification.
- HDU 2,5,6 - rectification work ongoing due to issues found during verification.

Can you also advise on the adjacent comment:

At first glance of these reports the ones that concern me are NICU and SCBU

They have validated NICU against a SCBU and not a critical care area. As per SHTM 0301 NICU should be air changes of 10 and pressure of +10PA. I think we need to ask them to reissue the report on that basis.
I Agree with your comments as this area is intensive care so should fall under 10AC/HR and operate at +10Pa pressure, although this is H&Vs report and one of the reasons why I have replaced them with Correct Air Solutions.
Estates could arrange to carry the work out again and generate a new report, or note the area as being non-compliant and discuss a game plan to correct, following a review of the area and ventilation plant if in fact the plant and area are suitable to meet current SHTM requirements.

Also concerned that SCBU despite having pressures that are negative is rated as Average. It would be highly unlikely that SCBU has negative pressure rooms by design and they are not being used as such.
As per the SHTM SCBU may have Isolation Rooms and they may be negative pressure, this would need to be reviewed and confirmed.

I need some more time to look at all of these reports and will send a more detailed summary over the next few days regarding SCBU and NICU, but wanted to alert you to these areas as being non-compliant

Kind regards
Teresa

Regards
Darryl

Darryl James Conner MIHEEM
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A49906791

FW: CRTICAL VENTILATION STEERING GROUP - MINUTES OF MEETING

Inkster, Teresa [redacted]

Wed 19/08/2020 16:31

To:INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted];

2 attachments

CRITICAL VENTILATION STEERING GROUP - action list.docx; Specialist Critical Vent meeting 240619.doc;

From: Magee, Linden
Sent: 11 July 2019 11:42
To: Inkster, Teresa [redacted]; Gallacher, Alan [redacted]; Peters, Christine [redacted]; Dodd, Susie [redacted]; Pritchard, Lynn [redacted]; Clarkson, Kerr [redacted]; Brown, Hugh [redacted]uk>; Conner, Darryl James [redacted]
Cc: McNeil, Elaine [redacted]
Subject: CRTICAL VENTILATION STEERING GROUP - MINUTES OF MEETING

Dear All

Please find enclosed minutes of meeting held on 24th June 2019

The next meeting has been scheduled for 24th July

Regards

Linden
Helpdesk Manager
Facilities
QEUH
[redacted]

A49906791

NHS
Greater Glasgow and Clyde

Specialist Critical Ventilation Steering Group
Monday 24th June 2019 at 10am
Facilities Meeting Room 5, Labs Building, QEUH

Present:

Dr Teresa Inkster (TI)	Consultant Microbiologist
Dr Christine Peters (CP)	Consultant Clinical Microbiologist
Alan Gallacher (AG)	General Manager, Estates
Darryl Conner (DC)	Site Estates Manager, QEUH
Hugh Brown (HB)	Site Estates Manager, GGH
Ian McKenzie, (IM)	Correct Air Solutions
Kerr Clarkson (KC)	Estates Manager, QEUH
Linden Magee (LM)	Helpdesk Manager (minutes)

1	**Apologies** No apologies were received for this meeting	**Action**
2	**Verification reports analysis** TI advised that there appeared to be 5 reports missing, these included 3 reports from ICU and 2 from ward 4A Renal. DC confirmed invitation had been extended to include MRI staff. Interventional reports for Vascular Procedures differ from reports for Radiology. It was confirmed Theatres 15 and 16 were verified. TI indicated a difference between Theatres and Specialist rooms. DC confirmed will provide these reports to TI. Cardiology Labs – these systems are on the list but Infection Control do not have the reports. DC confirmed these will be provided. Aseptic/Pharmacy/PACE room/MRI/CT scanning/ED unit/PICU and ICU – these units are classed as Critical Care and as such require an overview of ventilation. These reports have not been provided. It was agreed TI would highlight on spreadsheet what reports Infection control have not received. DC confirmed the areas that have been verified will be provided to Infection Control (IC). Endoscopy should also be included as a critical area.	DC DC TI/DC

3	**Theatres** TI confirmed that the Theatre ventilation is covered by the TUM group. There are no planned validations for theatres. DC confirmed these are on the TUM plan. DI advised that another Infection Control Doctor is a member of that group. HB said TI could access the Theatre reports and information through smartsheets. AG will provide TI with access to smartsheets. TI stated that as a result of the above theatres does not require to be discussed at this group.	AG
4	**Asset Familiarity – PPVL, PPIR, BMT** DC advised that there are issues with the system in Ward 4B and require to shut down the plant to carry out servicing. There are challenges for Clinical Staff in 2 spaces being made available for works to be carried out due to patient activity. DC advised that in the event of a failure and work is required to be carried out on the ventilation system they may require wards to be decanted to carry out these works, for example if a heap filter requires to be changed this will affect the balance of the system which will affect the whole ward. CP asked if there were spare AHUs which could be used. IM confirmed there is only one. There is currently no contingency in place to rebalance the system. There is a possibility of decanting patients to the Beatson however this is putting immuno-suppressed patients at risk moving them. DC confirmed this would require to be an annual process. SD advised that there is a 6 – 8 week clinical conditioning/planning period for transplant patients. AG stated Estates would verify if no action is required it would only be in the event there were any issues or risks which would result in patients having to be moved. CP advised there was previous correspondence which suggested patients could move to another half of the ward. DC confirmed this would not be possible. It was confirmed that there is a thermal wheel in the AHU forthis area. Discussions took place in regard to removing the thermal wheel from the AHUs. DC/AG confirmed that this would be a significant piece of work which could take 6 months. TI raised concerns that there is a risk to immuno-suppressed patients where a thermal wheel is present. DC advised that the thermal wheel could be isolated. AG confirmed that a risk assessment or S-BAR would be required. S-BAR would be required if removing the thermal wheel. TI advised that an S-BAR had previously been completed for work in ward 2A/2B. This could be applied to ward 4A/B/C. It was agreed that this group would agree if an S-BAR was required however this would require to be endorsed at a higher level group. CP/AG confirmed that an option appraisal could be completed, this would identify and look to reduce any risks.	

	SD asked if this goes through the Verification process what are the risks should any issues be identified and if resulting in a decant. HB advised that all PPMs are carried out as required which should reduce faults occurring however faults could be identified at verification process at any time. The contingency would be to use hepa filters which would provide a 2 hour window to carry out works. It was agreed that air volumes and room pressures can be taken when patient is in room due to higher than specified hepa filters 14 instead of 12. AG suggested reviewing previous data/impact and why 14 was installed in first place. DC confirmed H14 have been used from commissioning. DC asked if Infection Control would support reducing filters from H14 to H12. CP advised there would be other issues which would require to be checked such as grills on ceilings which could affect the H14 to H12. DC advised that due to the life span of the current filters would be looking to reduce these to H12 at some point. IM confirmed that they are currently working beyond the specification for BMT patients. DC advised that a week's decant would be the preferable option operationally for Estates to verify the system. AG confirmed that this would be a huge clinical impact but preferable option for Estates to have the system fully checked. TI confirmed to move this type of patient is very high risk. LP advised that adults could be moved to the Beatson however there may not be a suitable to option for the children to be moved. AG confirmed would have checked if Ward 4B extract goes anywhere else. TI raised concern regarding water damage to room 3 in Critical Care. Infection Control should have been alerted to assess the risks to the patient. DC confirmed a scribe was completed and work was carried out on Friday and there should not have been any contamination from this. TI stated where there is water damage IC require to be notified to assess. High particle counts – this was attributed to ceiling link. TI stated this usually indicates water damage and that something on this occasion has changed. Dr John Hood, Microbiology has investigated changing risers/fire compartmentation in levels 3 to 11. The Fire Safety Advisor would require to agree to ensure all fire regulations were adhered to. Sealing these areas would be a significant challenge to Estates. CP stated the key control is positive pressure at door corridors and installing lobbies. DC confirmed that this is one of the actions on another group. CP advised that this should be agreed at this group due to this being the operational group. AG stated that although this work may not breach regulations it would be considerable disruption and less disruptive options could be reviewed such as controlled access. DC stated consideration is level of air from level 4 to 11 as this could flow into the wards and in particular level 7 with high risk CF patients. TI stated double door entry/hepa filtered corridor although not specified would lessen the risk.	AG/DC

5	**SOPs for remedial action** Verification reports that have been submitted for isolation room 3 in Paediatrics regarding flooring at WHB and toilet area dated 14.06.19, additional work and scribe was required. IM had spoken with Estates and the Ward Manager and were advised not to use the room. It was agreed that these verification reports require to be sent to Infection Control within 1 – 2 days in order for IC to evaluate any risks to patients. It was confirmed that this report was an observation . TI asked for clarity of what would require to be escalated to IC as certain issues within a report may affect a patient occupying a room and these require to be reviewed by infection control. It was agreed these reports would be reviewed and any issues escalated to infection control asap. It was confirmed that AG will review the process for these reports and the escalation procedure. TI advised that there are several reports which require feedback on what work has been completed or is still outstanding.	**AG**
6	**PPVL rooms** CP raised concerns regarding the purpose of PPVL rooms and their fitness for purpose. These rooms are not PPVL as specified as the toilets should be a negative pressure. If not ensuite then there have been modifications. IM confirmed that these rooms have extract grill and this was agreed by Board. Children who have suffered burns should be in a PPVL room and that the relevant data is recorded. DC confirmed there are still a few PPVL rooms which have still to be checked. TI will confirm to DC if they require any further information. CP advised that there should be a log book in all the PPVL rooms and a very clear paper trail. AG stated that log books would require to be implemented for all PPVL rooms across the site. AG confirmed that a discussion will require to take place with HFS to take this forward. A terms of reference requires to be drafted and agreement from Director of Facilities & Estates who this group reports back to and that this should be a Board Wide Group.	TI
7	**Room 2 QEUH** – modifications are being carried out just now to reinstate other grills. It was confirmed that a scribe has been completed. AG confirmed there will be a requirement to provide feedback to Infection Control. M & S are carrying out these works.	**AG**
8	**Plak wording for PPVL rooms** It was agreed that the plaks would read positive / negative pressure and the range in brackets. TI stated that this requires to be very clear to ward staff what is negative, positive pressure, the optimum and the escalation process if outwith this range. AG advised that failures will be alerted to Helpdesk and specific Estates staff via email.	

	It was confirmed that readings are recorded through the Building Management System (BMS) and that ward staff record this data manually on a daily basis. Concern was raised that there is no audio alarm to alert ward staff should there be a pressure. AG suggested providing named clinical staff a copy of emails from the BMS which alerts failures. TI confirmed will speak to clinical colleagues and agree a protocol in event of failure. DC to confirm what the time delay is if doors are left open.	**AG** **TI** **DC**
9	**Plant failure contingency plans / chilled beam – 6A** DC requested a list of all recorded chilled beam leakage incidents for Estates to review. It was agreed a report would be provided from FM First as far back as possible. DC to arrange a meeting with Clinical Teams (Myra Campbell would be point of contact) to discuss the contingency plans in the event of plant failure.	 **DC**
10	**Future Projects** BMT patients with infectious diseases require to be in a specialised room preferably within ward 4A. Ward 4C Haematology patients would require to be in same set up as ward 4A/2B although these patients are slightly less immuno-suppressed still require specialised room. DC asked IM if there were any works which could be carried out to increase the pressure in ward 4C. IM confirmed that the AHU serves 4 other floors. Discussion took place regarding reducing toilet extract or install drop down on doors however would not provide same result as in ward 4B. It was agreed that this would require a 2 to 5 year plan to review in detail to identify and eliminate risks and costs of work involved.	
11	**Date and time of next meeting** The next meeting will be held at 11am in room LO/B/005 on Wednesday 24th July 2019	

NHSGG&C - Critical Ventilation Systems

Gallacher, Alan [redacted]

Wed 28/08/2019 08:58

To: Clarkson, Kerr [redacted]; Riddell Mark (NHS GREATER GLASGOW & CLYDE) [redacted]; Guthrie James (NHS GREATER GLASGOW & CLYDE) [redacted]; Dodd Susan (NHS GREATER GLASGOW & CLYDE) [redacted]; INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]; Pritchard Lynn (NHS GREATER GLASGOW & CLYDE) [redacted]; Conner Darryl (NHS GREATER GLASGOW & CLYDE) [redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) [redacted]; French, Sofie [redacted];

Cc: Mcneil Elaine (NHS GREATER GLASGOW & CLYDE) [redacted]; Steele, Tom [redacted]; Bradbury, Gail [redacted];

2 attachments

CRITICAL VENTILATION STEERING GROUP - action list - July 2019.pdf; Specialist Critical Vent meeting 310719 - Minutes.pdf;

All,
Please find attached for your perusal and attention the minutes and rolling action from the Critical ventilation meeting held on 31 July 2019.

Darryl,
Can you ensure Ian McKenzie gets visibility of these minutes.
The next meeting will take place on Wednesday 11 September @ 1030am, venue to be agreed.

Regards,

[redacted]

Alan Gallacher - CEng MIMechE, BEng(Hons), DipEM | General Manager Estates | NHS Greater Glasgow and Clyde | CMB Building | Queen Elizabeth Univerity Hospital | 1345 Govan Road | Glasgow | G51 4TF
t: [redacted] | internal [redacted] | m: [redacted] e: alan.gallacher[redacted]

SUSTAINABILITY ACTION
Our NHS Our People Our Planet

Think SAFE ENVIRONMENT.. ....please help cut carbon.....don't print this email unless you really have to.....and remember to recycle.....SAVE ENERGY - THE EASY WAY TO SAVE MONEY!

-----Original Appointment-----
From: McNeil, Elaine
Sent: 14 June 2019 09:58
A49906791

To: Steele, Tom; Clarkson, Kerr; Riddell, Mark; Guthrie, James; Dodd, Susie; Connelly, Karen; Inkster, Teresa (NHSmail); Pritchard, Lynn; Powrie, Ian; Conner, Darryl James; Gallacher, Alan; Purdon, Colin; French, Sofie
Cc: Peters, Christine
Subject: QEUH Critical Ventilation Systems - CHANGE OF MEETING TITLE
When: 24 June 2019 10:00-12:00 (UTC+00:00) Dublin, Edinburgh, Lisbon, London.
Where: Facilities Meeting Room 5, Ground Floor, Facilities Department, Labs Building, QEUH

When: 24 June 2019 10:00-12:00 (UTC+00:00) Dublin, Edinburgh, Lisbon, London.
Where: Facilities Meeting Room 5, Ground Floor, Facilities Department, Labs Building, QEUH

Note: The GMT offset above does not reflect daylight saving time adjustments.

~~*~*~*~*~*~*~*~*~*

Invite Sent on Behalf of Darryl Conner

Dear Colleagues

Please note that the title of the meeting has changed from Isolation Rooms Steering Group Meeting to QEUH Critical Ventilation systems.

Regards

Elaine

Dear Colleagues

This is the second meeting of the group to discuss the isolation rooms.

Future meetings will be held on a monthly basis, dates to be circulated.

Regards

Elaine

NHS
Greater Glasgow and Clyde

Specialist Critical Ventilation Steering Group
Wednesday 31st July 2019 at 10am
Facilities Meeting Room 5, Labs Building, QEUH

Present:

Dr Teresa Inkster (TI)	Consultant Microbiologist
Iain Thomson (IT)	Lead Nurse, Critical Care QEUH
Alan Gallacher (AG)	Assistant Director (Interim), Estates & Property
Ian McKenzie, (IM)	Correct Air Solutions

Apologies

Gail Bradbury (GB)	Business Systems Administrator (minutes)

1	**Apologies** Apologies were received from: Darryl Conner (DC), Site Estates Manager, QEUH Hugh Brown (HB), Site Estates Manager, GGH Kerr Clarkson (KC), Estates Manager, QEUH	**Action**
2	**Verification reports analysis** TI confirmed that she had received some of the verification reports request. Reports for ITU, MRI/CT, ED Decontamination Room and Cardiology Pacing rooms are still outstanding and DC will provide these.	**DC**
3	**Theatres** AG confirmed that he has arranged for TI to be given access to the SmartSheets containing the Theatre verification information. IT indicated that other clinical staff would need access to these sheets in order to provide evidence for HAI visits. AG confirmed that can be arranged if a list of clinical staff can be forwarded.	**AG/TI**
4	**Pressurised Rooms** TI raised a concern that clinical colleagues were unsure of the acceptable tolerances for the pressurised rooms. IM indicated that signage is being prepared and installed in areas that have pressurised rooms which will indicate the pressure that the rooms should be at and who to contact if the pressure changes. AG stated that an alarm should be seen on the BMS system when pressure changes when the rooms are out with the tolerances and key Estates staff are alerted by text message/e-mail. The BMS system is monitored within the QEUH Helpdesk. AG will ensure that there is an SOP in place to outline the procedures to be followed where there is a failure or where there is non-compliance around the pressure regime. This will be similar to the Theatre SOP	**AG**

Specialist Critical Ventilation Steering Group – Minutes of meeting - July 31st 2019

	but simplified. TI indicated that pressurised rooms often have to be used as standard rooms when not in use and that the doors are often left open. Is there a way to override the alarms in cases like that? IM indicated that the internal doors could be left open which would prevent the alarms but if the door to the corridor was left open the air exchange would be from the corridor and not clean air and the air will become stale. TI asked if there was any infection control risk to doing that. IM stated there was no obvious infection control risk but that the environment might be unpleasant or uncomfortable for the patient. This would be discussed further at future meetings.	
5	**Contingency Plans** DC was to meet with Myra Campbell, Clinical Services Manager at the Beatson to discuss contingency plans in the event of plant failure. AG will get an update on this from DC. TI stated that in the event of a catastrophic failure of a ventilation unit, that there would need to be a plan in place to relocate ID patient but that BMT patients could remain in situ and a portable Hepa filter used. This needs to be highlighted to the clinical staff. IM indicated that negative pressure rooms have self-contained ventilation systems and would continue to function in the event of a general ventilation system failure. AG stated that clinical staff need to have contingency plans in place for patients in the event of a plant failure. It could take 2-3 days for Estates teams to get a replacement unit in place. Also when annual verification of units in critical areas takes place, the unit needs to be taken out of commission for the verification. Contingency plans would need to be in place. TI stated that so long as they could be given 2 weeks notice of a planned verification that can be accommodated. AG stated that information can be provided. AG will check with DC on what the communication process is to clinical staff when ventilation verifications are scheduled.	**AG/DC** TI **AG/DC**
6	**Chilled Beams** TI advised that there have been 120 rooms reported over the last 4 weeks with water leakage from Chill Beams. AG will check with Colin Purdon on these reports and report back to the group. TI asked if the Beatson has Chill Beams and if they have been having similar issues to those at the QEUH. AG will check with Mark Riddell and report back. Post meeting note: The Beatson does have Chilled Beams, the exact location will be determined for the next meeting.	**AG/CP** **AG**
7	**SBAR for Ward 4C** TI advised that she had circulated the SBAR for Ward 4C to the group for feedback. The group agreed that they endorse the recommendations in the SBAR. AG will discuss with Tom Steele, Director of Estates & Facilities what the escalation path should be to progress these recommendations.	**AG**

Specialist Critical Ventilation Steering Group – Minutes of meeting - July 31st 2019

8	**AOB** TI quoted extracts from the validation reports: PICU – not enough isolation rooms. Requirement is 50% SCBU – 4 Bedded area sited as having negative pressure of -4. Is this by design? AG/CP discussed this and believe that rebalancing can achieve the correct pressure in this area. IM will take a look at the room and adjust the pressure in the interim. NICU – This area has been validated as if it was a SCBU. It should have been validated in the same way as PICU HDU – Need to review pressure rooms on the basis of the validation report findings. AG will arrange a meeting with QEUH Site Estates Management, TI, DC, IM and Jamie Redfern, GM Royal Hospital for Children and Jen Rodgers, Chief Nurse Royal Hospital for Children to discuss the findings from the validation reports. In response to the action item relating to Ward 4B extract, IM confirmed that the units only serves Ward 4B and no other area.	**AG**
11	**Date and time of next meeting** The date and time of the next meeting is still to be determined	

RE: critical care QEUH

Conner, Darryl James [redacted]

Mon 05/08/2019 13:30

To:INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted];

Cc:alan.gallacher[redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE) <Colin.Purdon[redacted];

6 attachments

Queen Elizabeth University Hospital - HDU 1 Beds 1-10.pdf; Queen Elizabeth University Hospital - HDU 2 Beds 11-20.pdf; Queen Elizabeth University Hospital - HDU 5 Beds 41-49.pdf; Queen Elizabeth University Hospital - HDU 6 Beds 50-59.pdf; Queen Elizabeth University Hospital - ICU 3 Beds 21-30.pdf; Queen Elizabeth University Hospital - ICU 4 Beds 31-40.pdf;

Hi Teresa

As requested.

The recommendation is poor as per the SHTM but not necessary down to ACH rates in all instances, happy to discuss at your convenience.

Best

Regards

Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conner[redacted]

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)[redacted]
Sent: 05 August 2019 13:20

To: Conner, Darryl James [redacted]
Subject: [ExternaltoGGC]critical care QEUH

Hi Darryl

There has been reference made to the validation reports for critical care at QEUH , at a couple of recent meetings I have been to. Can I have copies of them

Thanks
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

w: Isolation room verification reports

INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)

Mon 26/08/2019 15:47

To:Conner Darryl (NHS GREATER GLASGOW & CLYDE) [redacted];

Cc:Peters Christine (NHS GREATER GLASGOW & CLYDE) [redacted];

1 attachment

2016-06-29 QEUH isolation rooms report d0 05 (8).pdf;

Darryl - one of the outstanding actions from the ventilation group is in relation to PPVL rooms - see below.

I am trying to put a guide together for RHC as to which rooms can be used for which patient groups. We still cannot confidently state what our PPVLs can be safely used for, particulary those in a critical care setting with no en-suites. I had also suggested we invite Prof Noakes to come and do some testing with labelled CO2 to inform us as to whats happening in these rooms,

Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Sent: 28 May 2019 10:10
To: Conner Darryl (NHS GREATER GLASGOW & CLYDE)
Cc: Steele, Tom; alan.gallacher[redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE)
Subject: Re: Isolation room verification reports

Thanks Darryl

There were a few of the rooms I had concerns about, this was just the example I picked. It would be useful to spend time at the meeting going over them all. I only have reports for RHC. Is it possible to get reports for the QEUH rooms as well?

Whilst we now have negative pressure rooms for infectious patients we are still using these PPVLs for immunosuppressed patients for which there was an exclusion in the guidance . Cracks in the

fabric and holes can be an issue depending on the extent as the premise for these rooms is that they are sealed.

It would also be useful to discuss how many of the remainder were built with modifications on the orginal design and whether there is anything we can do about that. I note a latent defect in this particular report.

I have attached the HFS report into these rooms for discussion on Friday

It would also be useful for this group to review the other specialist ventilated areas such as interventional radiology, endoscopy, pacemaker rooms etc.

Ian Powrie had drafted an annual verification SOP, it would be useful to look at that also

Thanks
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

From: Conner, Darryl James [redacted]
Sent: 23 May 2019 18:28
To: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Cc: Steele, Tom; alan.gallache[redacted]; Purdon Colin (NHS GREATER GLASGOW & CLYDE)
Subject: Isolation room verification reports

Hi Teresa,

Tom has asked me to contact you regarding your concerns for a particular isolation room verification report :

RHC Ward 2C - Isolation Room 5

The report itself shows the facility in a poor condition, I believe the obvious questions are:

1. Why has the room been signed off and handed back for use?
2. Is the particular patient group occupying the space at risk based on the reports poor rating of the suites condition?

To explain why the facility is fit for purpose and does meet the requirements of the SHTM04 Sup 1, the individual components of the report must be assessed and risk assessed against the current guidance which reads as follows:

Section 2 – Definition of terms
Assessment of compliance with SHPN 04 Supplement 1

Poor
Air volumes and hence air-change rate is less than 75% of the design. Room pressure differentials do not ensure a
flow from clean to less clean areas; supply or extract air diffusers are not clean; pressure stabilisers not clean and/or
not operating correctly; visible faults in the fabric of the suite; doors unable to close completely; general air of neglect.
Action: Urgent management action required.

Average
Air volumes and room pressure differentials approximate to the original design values; supply air diffusers clean but
extracts visibly fouled; most pressure stabilisers clean and operating correctly; minor faults in the fabric and décor of
the suite.
Action: Maintenance action required.

Good
Better than average.
Action: None.
Maintenance quality

Poor
More than three answers are negative.
Action: Management action required by estates/facilities department.

Average
No more than three answers are negative
Action: Maintenance action required.

Good
No answers are negative.
Action: None.

The report for this room shows a non-favourable poor grading due to " More than three answers are negative" and **not** because "Air volumes and hence air-change rate is less than 75% of the design and that Room pressure differentials do not ensure a
flow from clean to less clean areas"

This can be viewed in the adjacent abstract from the attached verification report:

Item 11 is a latent defect from building handover so automatically compromises the suites ability to achieve a good rating.
The ACH rates in two instances actually exceed design (values 14.8 & 10.6) and in the other instance for the lobby is well within 75% of design (61.9) as shown adjacent :

The other factor that caused the rating to be poor on the report was the lobby pressure being out of spec at 16pa for room 5, this was caused by the adjacent suite undergoing its negative pressure conversion (Room 6), during that period and then being returned back to PPVL when the space was not achieving design in its negative state, the outputs for these rooms where crossed over thus giving the false reading, this is now being addressed to reflect the true difference between both facility's. As a result of this and the completion of these works I expect the next verification of this space to be much more favourable as the items pulling the grading down will have been addressed.

To summarise the fundamental requirements of a PPVL room were achieved, that being 10 ACHs or more and the correct pressure cascade established to ensure patient protection for PPVL application. The report rating shows the facility in a black and white manner and is scored as per the current guidance. I believe These reports can be improved and more detailed, there for as an initiative I have now implemented the change of specialised contractor conducting these verifications on our behalf with a clear remit to address all concerns regarding these important facility's, this will contribute to faster report completion time and remedial work turn around based on any advisories stated within the report, and overall more detailed finalised reports improving our understanding of the condition of our assets.

Hopefully I have been able to highlight the interpretation of these isolation room verification reports and the classification they can be given due to the high standards that they are validated and subsequently annually verified to. These are all topics that we can discuss at our newly established Isolation room steering group (Invites out tomorrow for 31/05/2019) in the interim I am happy to assist and discuss any and all questions you may have regarding the subject.

Best

Regards

Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conne[redacted]

RE: Isolation room verification reports

Conner, Darryl James [redacted]

Mon 26/08/2019 17:13

To: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted];

Cc: Peters, Christine [redacted];

Hi Teresa,

Would you like to discuss on Thursday or prior to then perhaps?

Based on the already submitted information :

Isolation room asset register
Isolation room Verification documents

I'm not sure how estates can advise on the application of these rooms other than what's stated in the guidance.

Kind

Regards
Darryl

Darryl James Conner MIHEEM
Interim Site Manager Operational Estates (SMOE)
Queen Elizabeth University Hospital Campus,
Labs Bldg.
1345 Govan Rd
Glasgow
G51 4TF

Tel: [redacted]
Mob: [redacted]
Email: Darryljames.conner [redacted]

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE [redacted]
Sent: 26 August 2019 15:48
To: Conner, Darryl James [redacted]
Cc: Peters, Christine [redacted]
Subject: [ExternaltoGGC]Fw: Isolation room verification reports

Darryl - one of the outstanding actions from the ventilation group is in relation to PPVL rooms - see below.

I am trying to put a guide together for RHC as to which rooms can be used for which patient groups. We still cannot confidently state what our PPVLs can be safely used for, particulary those in a critical care setting with no en-suites. I had also suggested we invite Prof Noakes to come and do some testing with labelled CO2 to inform us as to whats happening in these rooms,

Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Sent: 28 May 2019 10:10
To: Conner Darryl (NHS GREATER GLASGOW & CLYDE)
Cc: Steele, Tom; alan.gallacher [redacted] Purdon Colin (NHS GREATER GLASGOW & CLYDE)
Subject: Re: Isolation room verification reports

Thanks Darryl

There were a few of the rooms I had concerns about, this was just the example I picked. It would be useful to spend time at the meeting going over them all. I only have reports for RHC. Is it possible to get reports for the QEUH rooms as well?

Whilst we now have negative pressure rooms for infectious patients we are still using these PPVLs for immunosuppressed patients for which there was an exclusion in the guidance . Cracks in the fabric and holes can be an issue depending on the extent as the premise for these rooms is that they are sealed.

A49906791

11	Measure and record the supply and extract air flow in the principle ducts		X	Fire rated duct test points covere rated duct covers
12	Measure and record the air flow at all supply and extract terminals	✓		
13	Does the supply air meet the required minimum air change rate in the lobby (63AC/HR)		X	61.9 ACR
14	A positive pressure between 10 & 12Pa is achieved between the entry lobby and the corridor;		X	16Pa

Item 11 is a latent defect from building handover so automatically compromises the suites ability to achieve a good rating.
The ACH rates in two instances actually exceed design (values 14.8 & 10.6) and in the other instance for the lobby is well within 75% of design (61.9) as shown adjacent :

Section 5 – Supply & Extract Airflow Rates & Air Change Rates

Isolation Room 5 – AHU Ref.: 41AHU38					
Room Reference	Design Volume l/s-m³/Hr	Recorded Air Volume m³/Hr	Room Volume m³	Recorded AC/HR	SHPN (AC
Lobby (Supply)	300 - 1080	1089	17.58	61.9	6
Bedroom (Extract)	185 - 666	623	42.22	14.8	>
En-Suite (Extract)	45 - 162	148	13.93	10.6	>
Comments: Low air change rates were recorded in the lobby.					

The other factor that caused the rating to be poor on the report was the lobby pressure being out of spec at 16pa for room 5, this was caused by the adjacent suite undergoing its negative pressure conversion (Room 6), during that period and then being returned back to PPVL when the space was not achieving design in its negative state, the outputs for these rooms where crossed over thus giving the false reading, this is now being addressed to reflect the true difference between both facility's. As a result of this and the completion of these works I expect the next verification of this space to be much more favourable as the items pulling the grading down will have been addressed.

Section 3 - Executive Summary/Observations:

- The air change rate recorded in the lobby is low.
- The bedroom air change rate is above the minimum level.
- The lobby pressure is out of specification (16Pa)
- Magnehelic gauge is not wired into the BMS system so alterations cannot be made to bring the pressure back into specification.
- The room temperature is within specification.
- Hole in Vinyl in the Bedroom
- Crack in the ceiling in the Lobby

To summarise the fundamental requirements of a PPVL room were achieved, that being 10 ACHs or more and the correct pressure cascade established to ensure patient protection for PPVL application. The report rating shows the facility in a black and white manner and is scored as per the current guidance. I believe These reports can be improved and more detailed, there for as an initiative I have now implemented the change of specialised contractor conducting these verifications on our behalf with a clear remit to address all concerns regarding these important facility's, this will contribute to faster report completion time and remedial work turn around based on any advisories stated within the report, and overall more detailed finalised reports improving our understanding of the condition of our assets.

Hopefully I have been able to highlight the interpretation of these isolation room verification reports and the classification they can be given due to the high standards that they are validated and subsequently annually verified to. These are all topics that we can discuss at our newly established Isolation room steering group (Invites out tomorrow for 31/05/2019) I am happy to assist and discuss any and all questions you may have regarding the subject.

A49906791

Susie

Susie Dodd
Lead Infection Prevention and Control Nurse
Royal Hopsital for Children
[redacted]

From: Inkster, Teresa
Sent: 30 June 2019 11:07
To: Meikle, Kirsteen; Dodd, Susie
Subject: Re: Chill beam

Thanks Kirsteen
I have asked Dr Alison Balfour to contact you as she is the on call micro Consultant today and has been in touch with me re this issue. I had suggested estates check the ceiling voids above the rooms to make sure no water is collecting up there

Kind regards
Teresa

Sent from my BlackBerry 10 smartphone on the EE network.

From: Meikle, Kirsteen
Sent: Sunday, 30 June 2019 10:58 AM
To: Dodd, Susie
Cc: Inkster, Teresa
Subject: Chill beam

Hi Susie

We had an issue lastnight with the chill beams in rooms 3, 4 and 5. They were all dripping and the patients had to be moved. This was an issue all over the hospital. Estates attended lastnight and have said the issue has been sorted.

We are awaiting the wall washers today then were told the rooms could be used.

I have contacted on call microbiologist for advice via switchboard but it is just ringing out. I will continue to call them, but wanted to send you an email so you were aware of our situation.

Kind Regards

Kirsteen

37

Julie Rothney

From: Peters, Christine
Sent: 23 August 2017 16:24
To: Armstrong, Jennifer
Subject: Infection Control and the work on 4B for BMT

Importance: High

Dear Dr Armstrong,

I am writing to you with regard to the planned works to 4B at the QEUH.

I became aware on Friday that this work was planned to commence on Monday 21/08. I also received a handover from Teresa regarding the project for me to follow up with infection control . The work was put on hold as it transpired that there had not been ICD sign off of the HAISCRIBE and substantial gaps in information were identified. Brian Jones chaired a meeting this morning which I was invited to and I expressed a number of concerns that I have regarding this work which he asked me to put in writing to yourself.

My concerns are:

1. There is currently no clarity regarding the division of ICD responsibilities between the ICDs.

   [redacted], Pepi and I have repeatedly requested this in writing from the IC SMT and have not had a response. This is particularly important with regard to the large volume of work that Teresa was undertaking in her lead role. A direct result of this dubiety is the situation we now find ourselves in with regard to 4B works. [redacted] was expected to sign off a complex piece of work with insufficient information and also had been (verbally) assured repeatedly that Teresa high end jobs would not be [redacted] responsibility including "ventilation issues". Given the history of this building with regard to IC sign off it is astonishing to me that we are once again in a position where pressure is being put on an ICD to sign off without information or the clear and helpful backing of the SMT and without knowing what their level of responsibility is for this work. There is obvious danger in having two ICDS unsure of what areas they cover and from a contractual point of view it is not clear what sessional commitment they have.

2. With regard to the HIASCRIBE itself – there are basic flaws in the planned risk mitigation to a Class III/IV work:

   - Moving immune –compromised patients into an area adjacent to work where a high level of dust generation is expected in an area where negative pressure cannot be achieved – this is in contravention of HAISCRIBE recommendations and is now being addressed.
   - a lack of detailed planning around patient movements and impact of changes to the ventilation throughout the phased work potentially exposing high risk patients to changes in ventilation parameters that had not been assessed – eg going down to 1 air exchange per hour which would be unacceptable for any patient group, never mind those at high risk of airborne infection.
   - No mention of critical issues in the unit with regard to water quality, Dialysis points leaking (as in ITU) and prep room ventilation
   - Over all lacked a detailed understanding of the process of the work and impact on patient group.
   - There is no clarity about the commissioning process once the work is completed who , what, when , how?

3. The entire premise of the nature of the work that is being carried out is flawed:
   - I have been told repeatedly that this is a Board decision and the work WILL go ahead as, to summarise, a risk assessment has pitted IC risks against clinical risks and the latter outweighs the former. This worries me as I do not believe infection control risk mitigation is mutually exclusive of

clinical risk, rather it is inherent in patient care to prevent infection, particularly when there are longstanding standards that ought to be met , especially in a brand new building.

- As this is a Board decision, it is vital that at this stage that there is a clear process of how the Board anticipate commissioning of the unit is to be carried out - this must (and does not currently) involve looking at water quality, dialysis points, agreed environmental testing baselines, actions to be taken in the event of failures and a very detailed Board risk register entry regarding the sub optimal status of the ventilation parameters and a clear decision regarding the proposed use of Antifungal s and bio markers as a replacement for building/engineering controls.

- Two years ago I walked into ward 4B which was housing BMT patients and I rapidly identified that the environment was not protective for them and air sampling confirmed this (importantly not the other way round as has been the impression given in many documents since). This was after 1 million pounds was spent on the unit to ensure it was made suitable for this patient cohort. I made a table of recommendations, which frankly is not far from the document produced by HPS after a lot of time, and a second amount of money was spent on the unit which still did not achieve an adequate change in the facility to enable IC sign off. We now have an idea that by changing the ceilings in the bathroom , not altering the ventilation and then doing base line testing we will have achieved a substantive change. We will not.
- There needs to be concurrent progress with regard to the levels of protective ventilation achieved in the ICU where these patients are also housed, I have not seen any evidence that this has progressed and neither can anyone in the team advise whether this is in hand or not.

In conclusion Dr Armstrong, I am fully aware that I am no longer an ICD, and that there are documents/decisions that I am not aware of. However the handovers from Teresa, my direct experience over the last 3 days in supporting [redacted] as [redacted] line manager and conversations and lack of information from the ICT, as well my history within this organisation of having raised patient safety concerns related to infection control , mean that I feel that it is my GMC duty to raise my concerns with you as the Medical Director and Lead for HAI within GGC.

Regards,

Christine

Dr Christine Peters
Consultant Microbiologist
Head of Department Clinical Microbiology
Queen Elizabeth University Hospital,
GGC
Ex [redacted]
Mobile: [redacted]

Julie Rothney

From: McCamley, Pamela on behalf of Armstrong, Jennifer
Sent: 03 September 2017 19:12
To: Peters, Christine
Cc: Armstrong, Jennifer
Subject: RE: Infection Control and the work on 4B for BMT

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Red Category

Dear Dr Peters

Thank you for your email of 23rd August regarding the planned works in ward 4B at QEUH.

The NHS GGC Board has oversight of the works progressing in ward 4B QEUH. The proposals for the service were developed as a result of a review of options which were evaluated by a multi-speciality team including representatives from the IPCT. A detailed risk assessment formed a key part of this process and this resides on the Regional Services Risk Register. I can assure you that patient safety was the paramount consideration during this process, and that the NHS Board acts upon the recommendations made by the clinical and managerial teams who have primary responsibility for these patients. The future of this clinical service will be fully discussed and monitored through the Regional Services and Acute Clinical Governance Committees and progress reviewed at both Acute and Board Infection Control Committees.

Prof Jones, Tom Walsh, Isobel Neil and Sandra McNamee have been working to ensure the appropriate and sustainable provision of ICD cover across NHSGGC. I note that the service has been under pressure due to the unfortunate absence of Dr Inkster as Lead ICD and I am grateful to those contributing to the work of the IPCT in very trying circumstances. I am advised that the IPCT Senior Team have met with the ICDs to review commitments and provide reassurance around accountability and escalation procedures. Once agreed these arrangements for the IPC Team members will be clearly communicated to all relevant members of the IPC and Microbiology Management and Clinical Teams.

I am aware that [redacted] had been involved in the HAI Scribe process for these works during June and July 2017 and that Prof Jones arranged the urgent meeting to address an aspect of ventilation control which was subsequently identified on Friday 24th August. I am further advised that Prof Jones will lead the ongoing process relating to the building and commissioning works, including environmental testing in ward 4B from a coordinating ICD perspective and that expertise from other GGC colleagues, HPS and HFS will be sought where required.

As the lead microbiologist for the national allograft programme, Prof Jones will continue to liaise with clinical colleagues on the issues of chemoprophylaxis and monitoring of patients for IFD.

With reference to the Estates element of ward commissioning arrangements, I understand you received a full response on 24th August to the questions you posed at the meeting. As part of this response estates colleagues have confirmed that a full validation and verification exercise around air changes and, where required, pressures within Ward 4B will be undertaken in accordance with SHTM03-01. This action will be managed in accordance with the agreed and final plan of work and copies of the validation reports will be made available to the coordinating ICD.

The response also confirms that a survey of QEUH was undertaken where rooms fitted with dialysis points were reviewed. For clarity and assurance Ward 4B was included within that survey and there was no evidence of leakage or mould growth found within the cavity space. They have also indicated that water quality should not be an issue within this area as a robust planned maintenance schedule is in place supporting the water assets in compliance with SHTM04-01.

Finally, we are awaiting a report from Health Protection Scotland regarding the status of the isolation rooms in ITU. A patient pathway for highly infectious respiratory pathogens has been agreed and implemented in the interim.

I hope the above provides the clarification and assurance you are seeking; if you have further concerns I would encourage you raise these through the appropriate clinical and governance systems and committees.

Kind regards

Jennifer

Dr Jennifer L Armstrong
Medical Director
NHS Greater Glasgow and Clyde

From: Peters, Christine
Sent: 23 August 2017 16:24
To: Armstrong, Jennifer
Subject: Infection Control and the work on 4B for BMT
Importance: High

Dear Dr Armstrong,

I am writing to you with regard to the planned works to 4B at the QEUH.

I became aware on Friday that this work was planned to commence on Monday 21/08. I also received a handover from Teresa regarding the project for me to follow up with infection control . The work was put on hold as it transpired that there had not been ICD sign off of the HAISCRIBE and substantial gaps in information were identified. Brian Jones chaired a meeting this morning which I was invited to and I expressed a number of concerns that I have regarding this work which he asked me to put in writing to yourself.

My concerns are:

1. There is currently no clarity regarding the division of ICD responsibilities between the ICDs.

   [redacted], Pepi and I have repeatedly requested this in writing from the IC SMT and have not had a response. This is particularly important with regard to the large volume of work that Teresa was undertaking in her lead role. A direct result of this dubiety is the situation we now find ourselves in with regard to 4B works. [redacted] was expected to sign off a complex piece of work with insufficient information and also had been (verbally) assured repeatedly that Teresa high end jobs would not be [redacted] responsibility including "ventilation issues". Given the history of this building with regard to IC sign off it is astonishing to me that we are once again in a position where pressure is being put on an ICD to sign off without information or the clear and helpful backing of the SMT and without knowing what their level of responsibility is for this work. There is obvious danger in having two ICDS unsure of what areas they cover and from a contractual point of view it is not clear what sessional commitment they have.

2. With regard to the HIASCRIBE itself – there are basic flaws in the planned risk mitigation to a Class III/IV work:

   - Moving immune –compromised patients into an area adjacent to work where a high level of dust generation is expected in an area where negative pressure cannot be achieved – this is in contravention of HAISCRIBE recommendations and is now being addressed.
   - a lack of detailed planning around patient movements and impact of changes to the ventilation throughout the phased work potentially exposing high risk patients to changes in ventilation

parameters that had not been assessed – eg going down to 1 air exchange per hour which would be unacceptable for any patient group, never mind those at high risk of airborne infection.

- No mention of critical issues in the unit with regard to water quality, Dialysis points leaking (as in ITU) and prep room ventilation
- Over all lacked a detailed understanding of the process of the work and impact on patient group.
- There is no clarity about the commissioning process once the work is completed who , what, when , how?

3. The entire premise of the nature of the work that is being carried out is flawed:
   - I have been told repeatedly that this is a Board decision and the work WILL go ahead as, to summarise, a risk assessment has pitted IC risks against clinical risks and the latter outweighs the former. This worries me as I do not believe infection control risk mitigation is mutually exclusive of clinical risk, rather it is inherent in patient care to prevent infection, particularly when there are longstanding standards that ought to be met , especially in a brand new building.

   - As this is a Board decision, it is vital that at this stage that there is a clear process of how the Board anticipate commissioning of the unit is to be carried out - this must (and does not currently) involve looking at water quality, dialysis points, agreed environmental testing baselines, actions to be taken in the event of failures and a very detailed Board risk register entry regarding the sub optimal status of the ventilation parameters and a clear decision regarding the proposed use of Antifungal s and bio markers as a replacement for building/engineering controls.

   - Two years ago I walked into ward 4B which was housing BMT patients and I rapidly identified that the environment was not protective for them and air sampling confirmed this (importantly not the other way round as has been the impression given in many documents since). This was after 1 million pounds was spent on the unit to ensure it was made suitable for this patient cohort. I made a table of recommendations, which frankly is not far from the document produced by HPS after a lot of time, and a second amount of money was spent on the unit which still did not achieve an adequate change in the facility to enable IC sign off. We now have an idea that by changing the ceilings in the bathroom , not altering the ventilation and then doing base line testing we will have achieved a substantive change. We will not.
   - There needs to be concurrent progress with regard to the levels of protective ventilation achieved in the ICU where these patients are also housed, I have not seen any evidence that this has progressed and neither can anyone in the team advise whether this is in hand or not.

     In conclusion Dr Armstrong, I am fully aware that I am no longer an ICD, and that there are documents/decisions that I am not aware of. However the handovers from Teresa, my direct experience over the last 3 days in supporting [redacted] as [redacted] line manager and conversations and lack of information from the ICT, as well my history within this organisation of having raised patient safety concerns related to infection control , mean that I feel that it is my GMC duty to raise my concerns with you as the Medical Director and Lead for HAI within GGC.

     Regards,

Christine

Dr Christine Peters
Consultant Microbiologist
Head of Department Clinical Microbiology
Queen Elizabeth University Hospital,
GGC
Ex[redacted]
Mobile: [redacted]

Julie Rothney

From: McCamley, Pamela on behalf of Armstrong, Jennifer
Sent: 03 September 2017 19:12
To: Peters, Christine
Cc: Armstrong, Jennifer
Subject: RE: Infection Control and the work on 4B for BMT

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Red Category

Dear Dr Peters

Thank you for your email of 23rd August regarding the planned works in ward 4B at QEUH.

The NHS GGC Board has oversight of the works progressing in ward 4B QEUH. The proposals for the service were developed as a result of a review of options which were evaluated by a multi-speciality team including representatives from the IPCT. A detailed risk assessment formed a key part of this process and this resides on the Regional Services Risk Register. I can assure you that patient safety was the paramount consideration during this process, and that the NHS Board acts upon the recommendations made by the clinical and managerial teams who have primary responsibility for these patients. The future of this clinical service will be fully discussed and monitored through the Regional Services and Acute Clinical Governance Committees and progress reviewed at both Acute and Board Infection Control Committees.

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Jennifer

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Medical Director
NHS Greater Glasgow and Clyde

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     In conclusion Dr Armstrong, I am fully aware that I am no longer an ICD, and that there are documents/decisions that I am not aware of. However the handovers from Teresa, my direct experience over the last 3 days in supporting [redacted] as [redacted] line manager and conversations and lack of information from the ICT, as well my history within this organisation of having raised patient safety concerns related to infection control , mean that I feel that it is my GMC duty to raise my concerns with you as the Medical Director and Lead for HAI within GGC.

     Regards,

Christine

Dr Christine Peters
Consultant Microbiologist
Head of Department Clinical Microbiology
Queen Elizabeth University Hospital,
GGC
Ex[redacted]
Mobile: [redacted]

Julie Rothney

From: Jones, Brian
Sent: 30 August 2017 10:47
To: Peters, Christine
Cc: McQuaker, Grant; Morrison, Anne; Neil, Isobel; Devine, Sandra; Walsh, Tom
Subject: FW: Neutropenics 4B

Follow Up Flag: Follow up
Flag Status: Completed

Christine,

Please see responses to the issues you raised in red below.

Brian & Sandra

From: Peters, Christine
Sent: 27 August 2017 16:19
To: Jones, Brian; McNamee, Sandra
Subject: Neutropenics 4B
Importance: High

Hi Brian,

I went up to 4B today and it seems that there are severely neutropenic patients housed on the ward today.

A couple things about this:

1. What were the parameters agreed to for these patients to move into the ward prior to moving? How was this agreed? Only Teresa can answer this question. We are unaware of the contents of any conversations Teresa may have had with the clinical and managerial teams.

2. I had previously understood that only **non -transplant** haem-onc patients were accomodated at QEUH - currently there is [redacted] Are transplants occuring at QEUH site? We have contacted Grant McQuaker who responded:
"These are melphalan only autografts which are the lowest risk and are managed as out-patients in many centres, something we are looking at doing ourselves. They are v low risk and there have never been any concerning infective issues with these patients or the more immunosuppressed and more prolonged myelosuppressed acute leukemia patients that are also managed on QE site."

3. Is there a policy regarding when patients are transferred into protective isolation depending on neutrophil count and is this the same north and south? There is no policy that the IPCT are aware of. This would be lead by Haematology colleagues if they felt it was required. All patients are managed as though they are in protective isolation.

4. Regarding the water - while the system is under routine maintainance - I do not think water testing has been carried out which had been planned as there is a history of legionella in the building water supply, prior to haem onc patietns being admitted. As previously confirmed by estates colleagues "Water quality should not be an issue within this area as a robust planned maintenance schedule is in place supporting the water assets in compliance with SHTM04-01".

Most importantly as do we have any data on fungal infections in the haem-onc setting over the past 2-3 years in terms of incidence and timing of infections?

Brian with your involvement at the MDTs and as MIcrobiology Lead for BMT in Scotland, are you aware of any systematic process for monitoring infections post SCT and whether you have noticed any fungal infections in the QEUH patients?

All infections are discussed by the clinical teams at the relevant quality meetings. Our last formal audit in the allograft population showed an IFD rate of 0% (using EORTC definitions). No other specific issues with infection have been brought to my attention.

regards,

Christine

Dr Christine Peters
Consultant Microbiologist
Head of Department
Southern General Hospital
GGC
Ex [redacted]
Mobile: [redacted]

89. email Pseudomonas bacteraemias

Julie Rothney

From: PETERS, Christine (NHS AYRSHIRE AND ARRAN) [redacted]
Sent: 30 December 2019 12:42
To: Shepherd L (Lesley); BAIN, Marion (NHS NATIONAL SERVICES SCOTLAND)
Cc: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Subject: Pseudomonas bacteraemias

Hi Lesley

I had a quick look at pseudomonas bacteraemia cases last week. The data I have from Telepath has been gathered by new IT staff so I am not 100% confident in it but Kathleen Harvey wood said it didn't sound far out, and she keeps her finger very much on the pulse.

I did a gather on pseudomonas from all sites and sample types since July 2015 - September 2019 from laboratory LIMs system. This excludes the recent 3 cases which were all deaths.

Interestingly since the childrens hospital opened there have been only 9 patients with Pseudomonas aeurginosa bacteraemias ie rare.

1 was the [redacted] death in 2015
3 were part of 2A/ 6A water incidents
5 were [redacted] cases

All have been HAIs to date as far as I can briefly deduct. With only one death with [redacted] as noted in [redacted].

My conclusions - if this data is verified, :

1, PA bacteraemia is NOT common in any patient group 2. Death from PA bacteraemia has been rare till september 2019 in-fact one death in 4.5 years in a [redacted] which triggered a red HIATT and SG intervention in the serratia outbreak.
3. All have been HAI till September 2019

Of note 2 of the 5 in [redacted] were also isolated from BAL , and 3 were [redacted] patients.
Therefore the three deaths with PA bacteraemia recorded since then would represent the first 2 PA bacteraemias classified as non HAI, and include the first deaths with Pseudomonas aeruginosa since 2015. This clustering also represents an increase in frequency and occurs at a time of other environmental gram negative cases very similar to the patterns previously experienced in NICU, PICU and haem onc.

I would interested if HPS have looked atthe PA epidemiology in RHC and come up with similar numbers.

Again just to reiterate this is a very quick and inbetween calls kind of look at the data.
kr

Christine

Julie Rothney

From: Peters, Christine
Sent: 15 January 2020 11:57
To: Inkster, Teresa (NHSmail); WRIGHT, Pauline (NHS GREATER GLASGOW & CLYDE); Leanord, Alistair; Green, Rachel (NHSmail)
Cc: Ritchie, Neil; Peters, Erica; Khanna, Nitish; [redacted]); VALYRAKI, Kalliopi (NHS GREATER GLASGOW & CLYDE); Khalsa Kamaljit (NHS NATIONAL WAITING TIMES BOARD); Balfour, Alison
Subject: RE: [ExternaltoGGC]QEUH Patient Placement
Attachments: RE: Patient placementTo Subject Sent Size Categories ; RE: Patient placement

Thanks Pauline, Teresa, Al

With regard to the RHC , the last information I have is regarding issues I raised in September following a chicken pox case . A table was circulated but did not reflect what I found in reality on the wards as per attached emails. We have not had any updates since then . The PPVL rooms remain with substantial design differences from published validated design with no evidence of equivalence that I am aware of – this pertains particularly to the lack of negative pressure of en-suite to room , and the location of the extracts in the bedroom, which is not in the SHTM published design , as well as reduced ACH in the ensuites.

It would be excellent to have a quality assured, document controlled patient placement policy with live updates if issues emerge (previously had dampers blocked, AHU failures, leaking rooms) completed for both Paediatric and Adult settings for

1. Infectious patients
2. Immunocompromised patients
3. Infectious immune compromised patients

I agree the WHO warnings are helpful in renewing the focus.

Kind regards

Christine

Consultant Microbiologist

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]
Sent: 15 January 2020 11:39
To: WRIGHT, Pauline (NHS GREATER GLASGOW & CLYDE) [redacted]; Leanord, Alistair [redacted]; Green, Rachel (NHSmail) [redacted]
Cc: Ritchie, Neil [redacted]; Peters, Erica [redacted]; Khanna, Nitish [redacted]; Peters, Christine [redacted]; [redacted]; VALYRAKI, Kalliopi (NHS GREATER GLASGOW & CLYDE) [redacted]; Khalsa Kamaljit (NHS NATIONAL WAITING TIMES BOARD) [redacted]; Balfour, Alison [redacted]
Subject: [ExternaltoGGC]Re: [ExternaltoGGC]QEUH Patient Placement

Hi Pauline

The need for the patient placement policy was handed over by me when I resigned and we raised it several times in meetings with diagnostics senior management

I had a draft document in place but was unable to finalise due to the outstanding issues with the PPVL rooms delineated in the HFS report . There was an action for the facilities director at the end of August to take this aspect forward. These rooms were not built to specification in that they had modifications, and we have yet to establish what exactly they can be safely used for.

Perhaps in the meantime the IPCT could issue Comms on where the negative pressure rooms are within QEUH/RHC and confirmation that validation is satisfactory. Given the situtation with a novel coronavirus and WHO instructing hospitals worldwide to prepare we need this information clarified urgently

There were 4 negative pressure rooms signed off by me in QEUH but that was some time ago and it would be important to check with estates that there have been no issues with these rooms including whether there have been any subsequent validation reports issued, requiring ICD sign off

Kr
Teresa
Dr Teresa Inkster
Consultant Microbiologist, QEUH
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

From: WRIGHT, Pauline (NHS GREATER GLASGOW & CLYDE)
Sent: 15 January 2020 10:12
To: Leanord Alistair (NHS GREATER GLASGOW & CLYDE); LEANORD, Alistair (NHS GREATER GLASGOW & CLYDE); GREEN, Rachel (NHS GREATER GLASGOW & CLYDE)
Cc: Ritchie, Neil; Peters Seija (NHS GREATER GLASGOW & CLYDE); Khanna Nitish (NHS GREATER GLASGOW & CLYDE); INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE); Christine.Peters[redacted]; [redacted]; VALYRAKI, Kalliopi (NHS GREATER GLASGOW & CLYDE); Khalsa Kamaljit (NHS NATIONAL WAITING TIMES BOARD); alison.balfou[redacted]
Subject: Re: [ExternaltoGGC]QEUH Patient Placement

Hi Al,

Thanks for the response, and for Erica's input. The main issue is with negative pressure rooms in QEUH. I'm worried about relying on historical information / emails to make decisions about patient placement when there is nothing in writing. This happens not infrequently and we need the most up to date information to make the right decision.

My understanding is that the patient on Sunday night was in room 4 (SHDU1) rather than room 24, which Erica mentions in her email (cut and paste to the end of this email).

Teresa - can you comment?

Thanks

Pauline

Dr Pauline Wright
Consultant Microbiologist
Queen Elizabeth University Hospital

From: Leanord, Alistair [redacted]
Sent: 14 January 2020 15:24
To: WRIGHT, Pauline (NHS GREATER GLASGOW & CLYDE); LEANORD, Alistair (NHS GREATER GLASGOW & CLYDE); GREEN, Rachel (NHS GREATER GLASGOW & CLYDE)
Cc: Ritchie, Neil
Subject: Re: [ExternaltoGGC]QEUH Patient Placement

Pauline

Thanks. This was raised at AICC today.

A draft document has identified the rooms in RHC and work is underway, and hopefully will completed in short order.

Cheers

Al

Sent from my BlackBerry 10 smartphone on the EE network.

From: WRIGHT, Pauline (NHS GREATER GLASGOW & CLYDE)
Sent: Monday, 13 January 2020 04:43
To: Leanord, Alistair; LEANORD, Alistair (NHS GREATER GLASGOW & CLYDE); Green, Rachel (NHSmail)
Cc: Ritchie, Neil
Subject: [ExternaltoGGC]QEUH Patient Placement

As you know we have had several meetings relating to working a an ICD / giving IC advice out of hours as a Microbiologist at QEUH.

One of the issues we raised was the lack of an up to date patient placement policy based on validation data and we were assured that this would be made available as soon as possible. There was a recognition that this document would need to be dynamic, taking into account the ongoing work at this site.

I was called at 3am today by my ID colleague regarding appropriate patient placement for a patient under investigation for MERS coV.

Unfortunately the negative pressure rooms that I was aware of, rooms 43 and 44 were not available (one has an MDR TB case and the other a patient with complex respiratory problems who could not be moved)

My decision was that the PPVL room that the patient was in (HDU1 room 3) was the next best thing and advised the staff nurse to keep the patient there. She informed me that HDU1 room 4 has now been converted to a negative pressure room and that the nurses are checking the pressures daily and they are sitting between -8 to -12.

I changed my advice on the basis of this information and advised the patient be placed in HDU1 room 4.

I am not an ICD but as a Microbiologist giving out of hours Infection Control advice I need to have the most up to date information to do this.

I am concerned about the potential risks to staff / patients by putting the patient in inappropriate accomodation. In addition, every time this happens, an unnecessary amount of nursing and medical time is

spent trying to get this information instead of being able to give clear unambiuous advice and allow nurses and clinicians to get on with their jobs.

I might have missed an email communication about this and I apologise if that's the case but can you confirm to me if HDU1 room 4 is now a negative pressure room?
Can we have an up to date list of the current negative pressure rooms in QEUH and RHC?

Thanks for your help

regards

Pauline

Dr Pauline Wright
Consultant Microbiologist
Queen Elizabeth University Hospital

From: Peters, Erica
Sent: 14 January 2020 22:38
To: Leanord, Alistair
Cc: Wright, Pauline; Ritchie, Neil
Subject: FW: negative pressure rooms

Hi,
As discussed at the AICC today here is the email I had from TI last year. Clearly there are challenges using a room with no en suite if this is the 3rd room that was highlighted on Sunday night. I know that Teresa examined these reports carefully and as such I am confident in the 2 current rooms assuming appropriate checks via estates.

I welcome the ventilation placement document that is coming-I presume I will see it before approval via the AICC?

There were also rooms signed off in Childrens by the same company around the same time. I don't have any details of this and indeed no copies of the independent report but Teresa will have all of this.

Hope this helps.

KR

Erica

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE) [redacted]
Sent: 17 June 2019 13:41
To: Peters, Erica
Cc: Pritchard, Lynn
Subject: [ExternaltoGGC]negative pressure rooms

Hi Erica

Just to let you know that I have signed off the validation reports for the 3 negative pressure rooms in critical care. The rooms are 43 and 44 and 24 . Note 24 has no en-suite. All meet the requirements for pressure, air changes and have hepa filtered extract.

On failure they will alarm centrally and at the nurses station. Daily records of pressures should be logged (Iain Thomson is aware of this)

The IPCT are working on a patient placement guide as there are now two different types of room in use , negative pressure and PPVL.

There will also be work done to assist with the interpretation of the pressure gauges with the addition of positive and negative pressure signage (at the moment it is red/green colour only)

Let me now if you have any queries

Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
National Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

21a. RE 2A RHC Advice required

Julie Rothney

From: Peters, Christine
Sent: 10 August 2015 14:15
To: Wright, Pauline
Subject: RE: 2A RHC Advice required

Follow Up Flag: Follow up
Flag Status: Flagged

Crumbs!

From: Wright, Pauline
Sent: 10 August 2015 14:11
To: Peters, Christine
Subject: FW: 2A RHC Advice required

From: Jones, Brian
Sent: 07 August 2015 08:55
To: Wright, Pauline; Findlay, Bernadette
Subject: RE: 2A RHC Advice required

See below

Dear Sandra,

Further to our telephone conversation last night I would like to clarify that I do not have an IPC remit. I understand that you have discussed the situation with Pauline Wright and she feels unable to advise. I have discussed the situation at length with John Hood and he also feels that, as he does not have all the facts eg specification of the rooms and previous validation data, he is not in a position to give informed advice. Given that a patient is due to be admitted for SCT, John and I are prepared to come over to QUEH today to see what we can do to help.

It is certainly not my position to advise IPC how to manage their service but I am concerned that Craig Williams, Alison Balfour and Linda Bagrade all appear to be on a/l. This leaves Huma Changez who has been in post as a consultant for 2 days and Pauline Wright who does not have a remit for the Childrens Hospital. Pauline has not previously been involved in commissioning/air testing of the rooms in Schiehallion and has not received a hand-over from Craig Williams before he went on a/l. Furthermore, I am not aware of any plan/protocol for dealing with the rooms in light of air testing results.

From: McNamee, Sandra
Sent: 06 August 2015 16:45
To: Jones, Brian
Subject: 2A RHC Advice required
Importance: High

Hi Brian
I have had the communication from Dr Ewins in the Royal Hospital for Children asking for advice regarding admitting children for transplant in the BMTU (Ward 2a). You will see from the communication that one of the room grew aspergillus from air samples taken apparently rooms 20,24 & 25 grew penicillamine. Pauline Wright has reviewed all

the information available to her and is unable to make a decision based on what she has. Obviously there are kids waiting to start chemo so the unit need advice from someone in microbiology. Can you advise me how best to take this forward.

thanks
Sandra

Dear Sandra,
Craig Williams suggested that we contact you about the status of isolation rooms in 2A.
We plan to admit a patient for transplant today, however we have had to move a transplant patient yesterday because room 18 grew Aspergillus Flavium on 27/07.
We had been told that rooms 18& 20 had been cleaned and cleared for use, now I am unsure if we have an isolation room identified to admit our patient .

Can you help clarify the situation. We cannot start chemotherapy unless we are certain about the safety of the rooms.

Yours ,
Anna Maria Ewins

Mobile: [redacted]

Sandra McNamee
Associate Nurse Director
Infection Prevention & Control
[redacted]
[redacted]

Line No	**Section Heading**	**Comment on Factual Accuracy**
39	**1 Background to the Case Note Review** 1.1 Timeline of key dates leading up to the Case Note Review	
46		For context and accuracy the following should be included in line 46; Changes to the NICPM alert organism list were made in July 2107 and some gram negative organisms were being used as triggers before this (serratia and pseudomonas in particular, with extensive work on serratia done with HPS in 2016).
57		For context and accuracy the following should be included in line 57; 26.3.2018 CNO invoked the HPS National Framework – currently the order and wording in the timeline has the potential to omit some of the important time points.
72		For context and accuracy it should be added that the children were transferred back in February.
85		It would be useful to add that the IMT restarted on 19th June 2019.
90		For context and accuracy it should be added that this SBAR was reviewed in detail at the IMT on 6.9.2019 (Review Team have these minutes). As it stands line 89 is using selective information and presents an inaccurate and incomplete version of the facts.
127	1.2 Blood stream infections in paediatric haematology oncology patients	We append a Public Health Commentary on a number of issues, but will also reflect comments through this factual accuracy template as there is clear relevance to accuracy and context. There is published evidence of morbidity and mortality associated with blood stream infections and sepsis among paediatric haematology oncology patients. For context and a balanced presentation, it would be useful if the expected rate of BSI could be calculated for the NHSGGC unit, based on published data, could be included. The HPS Report (Nov 2019) published comparative data with GGC and 2 other Units in Scotland. This is not referenced within the draft Report and is of critical note in terms of decision making, expert advice and indeed Scottish Government support throughout the period. We believe that the lack of reference to this report is of material significance.

154-55		Again for context and balanced presentation, we request that the NHSGGC central line associated infections per 1000 CVC days be compared to rates in similar units and best practice. GGC CVC rates are currently - 0.77/1000 line days. Of note for accuracy, the clinicians highlight that peripherally inserted central catheters have not been shown to have lower infection rates compared to other types of central lines. The evidence is poor, but that which is available, supports the view that PICCs have a higher infection and failure rate. This is why they are not placed as standard in the paediatric oncology population.

2. Terms of reference and membership of the Panel

292	2.4.1 Identification of cases	We consider this statement to be inaccurate as we believe this should state 2 patients not 3 as per cases reported in IMT minutes 25.06.2019 (Review Team have these minutes)
296-314	2.4.2 Epidemiological and clinical outcome review	Given the known and well published risk of infections among this group of patients, it would be useful to add to the descriptive epidemiology (time, place, and person) comparison data to similar units and trends in infections along the years. This was done in the HPS Report (Nov 2019) and would present a more balanced view.
350	2.4.2 The Paediatric Trigger Tool	For fairness and accuracy it should be stated that, even an adapted PTT has not been validated for the purpose with which it was used in this Review and the local clinicians have expressed significant concern about its use.

3. Methodology

442	3.1 Overall timeline of the work undertaken for the Case Note Review	We consider that significant elements of the data were not requested until August 2020 and that clear requirements and expectations for environmental and microbiological data were not articulated fully until October 2020.
449		As noted in the CEO's covering letter, it is unfortunate that such a detailed focus is included within such a report as this on access to systems, data quality and response. There are a number of comments around availability of data throughout the report – which to the reader may appear that, GGC were being intentionally obstructive around providing data and access to systems. Clearly this was not the Boards intention and we do not believe it to be the reality. A full summary of all issues is appended however relevant sections to ensure an accurate representation are highlighted throughout this template. We do, however, accept that, in line with Boards across Scotland, the ability to link data has been limited and acknowledge that, going forward, this is an area for further action. The timeline below outlines timescales for providing access to data and systems. 19/08/20 • Elaine McCormick, Laboratory Information Systems Manager, first engagement with Marie Brown, regarding Telepath patient notepad information. • Specific patient details were provided on a weekly basis & the Telepath Patient Notepad information for the dates specified were provided back to Marie Brown as required. As described in the report the telepath notes is an internal laboratory annotation that microbiologist utilise to share information amongst this professional group to outline what they have communicated to medical staff within wards or across the organisation. PMP is an internal communication tool to enable notes to be visible to other colleagues involved in cases. This is not incorporated into the Boards portal care record as the clinical information is the detail of tests carried out as opposed to a "notepad". This continued through August – October as required with no significant concerns being raised to the GG&C team by the review team. • 21/08/20 • Elaine McCormick provided information regarding the display of results for specific patients in ICNet to Marie

		Brown. 22/09/20 • Data sharing agreement passed onto Elaine McCormick via Marie Brown, with regard to Telepath access for case note review staff:- - Peter Davey - Fiona Murdoch - Hayley Kane • Telepath Access Request forms were passed back to Marie Brown for completion by staff requesting access. – Access Request forms received back on 24.9.20 • Telepath training was organised on the 30.9.20 via Teams • Only Peter Davey attended. Telepath login was provided & training took place which included how to access the patient notepad. 9/10/20 • Telepath logins were provided for Fiona Murdoch & Hayley Kane. • Provided training documentation for Fiona Murdoch but login has never been used. • Hayley Kane was familiar with Telepath, as she had used the system previously in her role as an ICN. 12/10/20 • Email from Peter Davey to Elaine McCormick (with Marie Brown copied in) stating that it would be best to get labs to download the full patient notes for each of the case note review patients CHIs provided, and agreement that Elaine would be able to provide the information.
511	3.2.1 Datasets and definitions used to identify patients for inclusion in the Review	This section indicates the use of epidemiology data used in HPS 2019 review but dissents, without explanation, from its conclusions. It would be helpful if the rationale for this dissent could be made explicit in the report to ensure a full picture for accuracy.

627	3.4.3 The Paediatric Trigger Tool	As in line 350, we consider it would be prudent to indicate in the methodology that the Paediatric Trigger Tool is not validated in this situation.
772-3, 786		Whilst it is recognised there will always require to be judgements within a review such as this, it appears in this section, and elsewhere in the report, that judgements made are of a subjective nature without conclusive evidence which could question the accuracy of conclusions drawn.
803	3.6 Expert Panel Review Process 3.6.5 Final Outcome Reports	It is evident that without tightly defining 'the environment' this could apply to all patients.
828-829	3.6.6 Categorising the likelihood of an environmental source for an infection	A key omission for context; there is no reference to published literature on the methodology utilised by the panel given that causality is assessed using the Bradford-Hill criteria (J Roy Soc Med 1965:58:295-300) as any observed association may in fact be due to the effects of one or more of the following: chance (random error) ; bias (systematic error) ; or confounding https://www.healthknowledge.org.uk/e-learning/epidemiology/practitioners/causation-epidemiology-association-causation As noted previously, the report lacks an explanation of why the HPS report of November 2019 is not discussed and not referred to as part of the information utilised by GGC which is considered as a key document by GGC / HPS and Scottish Government colleagues.

836		It would be useful if clarification could be given if the methodology used was validated in terms of decisions made or the credibility of the overall findings could be challenged.
868 onwards		There are problems of definitions in the time periods that are being used. Species level clustering is not evidence of transmission events. Typing evidence that the 2017 stenotrophomonas cases were not linked to each other or to water were given to the Review 16.12.2020 and the stenotrophomonas whole genome sequencing sent on the same date with a presentation on the data on the same date. Overall unique typing evidence has been dismissed within the Review report which we consider leads to conclusions being incomplete with a selective use of available hard data.
868-876		In terms of context and transparency to understand the patient population, it would be important to highlight that *only* hospital sources were examined. In view of the extensive time such patients spend not only off the ward but 'on pass' at home, within an inpatient episode, it is considered that the current presentation of the position is misleading.
877-883		Context and accuracy; We are concerned that claims made in the IMT meeting 14.08.2019 as to limitations of sampling are influencing thinking here, and there are major national implications for infection control if the lack of positive samples during investigations can be dismissed. All gram negatives were tested for in March 2018 and positive samples would have been found if they were there. It is considered that there is a methodological problem overall if the view is that positive samples could nonetheless exist despite negative evidence. NHSGGC followed normal practice in sampling and typing.
884-895		This section is critical when the process followed is as per national protocol. The PHE protocol was followed, which was explained to the Review Team. The clinical microbiology report wording makes it clear what the comparator is at the time of typing – unique means unique, as in not found before. Whole genome sequencing builds on this but typing shows relationships in real time at IMTs and we believe it should be considered within the Review Team report.

1021	3.7 Communication with stakeholders 3.7.3 NHS GGC Clinical and Medical Staff	To ensure transparency of communications, it should be noted that there was no engagement and involvement with the wider IPC Team involved in these incidents, so unlike the team within the Paediatric Haematology oncology service, no opportunity was given to the IPC Team to raise concerns or ask questions, or indeed clarify linkages and context.
1035	3.7.4 NHS GGC Senior Management	Individual staff names should be removed from the report.

4. Descriptions of cases and episodes in the Review

1116 1136-1138	4.2.3 Diagnosis	The report states that that there was an excess of leukaemia in cases of bacteraemia compared to international studies. We believe this can easily be explained by the fact that HSCT patients are at higher risk of infection and leukaemia dominated the transplant cohort. It is surprising that transplant and non - transplant patients are not separately reported. We would appreciate it if this section was reviewed to ensure clarity. The population of patients seen in the case note review, while representative of the case mix seen in a nationally designated centre for BMSC transplant service, would be more susceptible to infections compared to other Units in Scotland – and we would believe the omission of this fact does not, therefore, provide a true reflection of the facts and, therefore, this should be altered.
1140-2	4.2.4 Frequency of infection episode	As the Review Team are aware CLABSI work reduced infection rates suggesting that 2017 incidents were not environmental. The lack of a baseline for this patient group is an issue here. Evidence of current 6A infection rates was provided recently- the latest SPC chart was sent to the Review Team on 24.2.21 and we believe that this omission, again, does not allow for a factually accurate statement and, therefore, this should be reflected.

1153	4.3 Microbiology profile of the isolates identified in the Review	We consider this to be inaccurate as it is unclear why May 2015 was used when the move to RHC took place in June.
1186	4.3.1 Enterobacter spp.	We consider that there are some facts that should be included in the narrative; Whole Genome Sequencing (WGS) was done on this and data sent to the Review Team on 5.10.2020.
1206-1220	4.3.5 Conclusions	Terms 'normally' and 'clusters' are undefined. The conclusions contradict HPS's own 2019 report ('*The data presented in this report do not provide evidence of a single point of exposure and there is a need to continually monitor the risk in this patient population*") which demonstrates that environmental infections were not newly seen after the hospital move – the report considered data from 2013 to 2019. 2015 was an abnormal period with low admissions due to the hospital move. There is no baseline and the Review is following a hypothesis despite existing evidence not supporting this. We are unclear what 'observations' mean. There is obviously a place cluster because only wards 2A/B population are under examination in this report. This evidence, which lacks certainty, is used to support a hypothesis, yet robust WGS and typing are not included in the analysis. This must be made clear in the report to ensure the full picture is provided and to ensure factual accuracy. Throughout our own extensive review and, now genome sequencing, we have only ever been able to link the environment to infection in two patients, firstly in 2016 when Cupravadis was identified in the Aseptic Dispensing Unit and secondly a cutaneous case of *Mycobacterium. chelonae* in 2019. This position was highlighted to you in correspondence at the end of last year, however this is not noted within the report and it is not clear how this fits with the

		methodology.
1210		There is a contradiction here noting that Klebsiella is the second most frequent cause of bacteraemia and that it can't be said if the numbers are higher than would be expected normally, and yet later in the report, you advise we should have spotted clusters. See later comment on Example 8.2.
1211-1215		The use of statistical methods (like indirect standardisation) would be more suitable to assess the chance of a real excess number and to avoid the cognitive bias of "Clustering Illusion".

5. The Role of the hospital environment as a source of infection

1260	5.1. Context	This should be corrected to read *Scottish Hospitals Public Inquiry.*
1299-1304		As noted in the CEOs covering letter, we are concerned that, in such a scientific and fact-based report that statements such as 'some feel' are included, rather it is important to present in a factual manner. Without balancing these statements with the overall views of the clinical teams, it cannot reflect the overall clinical views. The response to concerns referred to in this section were minuted in the IMT on 6/9/19 and were acted upon. There followed an extremely robust process to reopen 6A involving the work of HPS (November 2019 Report) and the Scottish Government. (Review Team have these minutes). Factual accuracy here is critical acknowledging the Public Inquiry now underway. Of interest is that one of the microbiologists, known to the Review Team has recently published an article noting that infection rates have remained low in 2020: Inkster, T, [redacted] (2021) Duty of Candour and communication during an infection control incident in a paediatric ward of a Scottish Hospital: how can we do better? J Medical Ethics 2021;0:1-5 We refer to the most up to date safety data as detailed in Appendix 4.

1320-9	5.2 The built environment and its maintenance	As explained to the Review the limitations of the Estates and Facilities systems are the same across NHS Scotland and the result of the national system in use.
1334		We would be interested to know of any examples of links of this type as this seems to contradict the hypothesis of an environmental link.
1345-7		This is inaccurate. An Estates Action Plan, which details actions in relation to 6A 2019 IMT hypotheses including chilled beam work, was sent to Review 14.10.2020
1356 etc, 1399	5.3.1 IPC audits	1378 : IPCAT audits were sent to the Review team on 4.9.2020 in response to request of 26.8.2020. No evidence that requests for something different were made by the Review Team. Facilities audits were supplied with Estates data later in 2020. The narrative is suggesting poor practice and this is inaccurate. The Scottish Government reviewed this process during the work of the Oversight Board so it is surprising that this is again being included in a parallel process. *Facts noted below in terms of Audit process;* IPCAT provides the Board with a profile of staff knowledge and practice with assurance in areas such as SICPs implementation and the implementation of care plans to reduce the risk of infection by invasive devices. (IPCAT - Safe IPC Practice in Acute Care was rolled out across NHSGGC Acute inpatient wards during 2015/2016 and comprises four sections; standard infection control precautions (SICPs), transmission based precautions (TBPs), safe patient environment (SPE) and quality assurance (QA) and this process was reviewed and following feedback from HIS report in 2019, we rationalised yet strengthened the process in May 2019. In addition the IPCAT Strategy was also reviewed to ensure alignment with National Monitoring Framework (NMF); thus establishing a framework which adds value to the audit process and supports a quality improvement approach. Following an IPCAT an action plan is automatically generated on the day with a timeframe for completion and separated into three clear categories (short, medium and long term). A lead is identified to ensure completed actions are recorded to provide a brief summary of rectifications/action taken including any further investigations and highlight local changes/interventions required to achieve reliability.

		One month following completion of IPCAT the IPCN and SCN/Departmental Manager will re-audit together any red or amber sections of the audit. Audit results and an action plan will be available on the IPCAT dashboard immediately following any re-audit and actions/findings followed and actioned up with Lead Nurse/Head of Department and agree an ongoing programme of re-audit locally to monitor for sustained improvement. All reports and related assurance information/data are available and a sample previously forwarded to the team. Once the follow up audit is complete the SCN should discuss with their lead nurse and agree and ongoing programme of re audit locally to monitor for sustained improvement (tools available online). The frequency of this should be agreed with the SCN/LN.
1388		All NHS GGC audit activity has been subject to scrutiny by the HIS Inspectorate during unannounced HEI inspections benchmarking NHS GGC audit activity against HAI Standards (2015) used to drive improvement. IPC audits are available for both wards 2a and 2b for 2016, 2017 and 2018 and for Ward 6a in 2018 and 2019, with audit results and action plans to be taken forward by the SCN to undertake improvement strategies. Completion of this work is recorded in the returned completed action plan within 1 month of IPC audit. Some criteria are identified as critical. Non-compliance with any critical criterion must be actioned with evidence of improvement within 24 hours. Please see actions completed within the IPC audit results and actions plans for each year. The IPC audit results are reported in the monthly sector / directorate activity reports. Lines 1385; 1395. Following an unannounced inspection undertaken at Queen Elizabeth University Hospital January 2019 the report highlighted a risk of overall IPCAT scores giving false assurance and not being reflective of individual elements of the audit where a score is low. The NHS GGC IPCT were invited to join a national group to write the National Monitoring Framework(https://hpspubsrepo.blob.core.windows.net/hps-website/nss/2678/documents/1_national-monitoring-framework.pdf)and subsequently took a proposal to the Board IPCC in November 2019 for approval. The IPCT revised the IPCAT audit tool and process as described in an SBAR and revised strategy SOP:

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Item 7.2 - SBAR Changes to IPCAT - dr

Item 7.2 - IPCAT Schedule and Process

This new process was being tested at the point of the COVID-19 pandemic.
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In terms of context please note the below details.

2A/6A underwent frequent IPC, SCIPS and hand hygiene audits during 2015 and 2019

SCIPS – 27 audits undertaken by senior nurses within the ward between 2017 and Dec 2019.This was at a greater frequency than prescribed by the process given the focus in infections, infection control and continuous improvement.

Of the 27 completed audits 26 were gold (a score over 90%) and one was green (80-90%. Nonetheless, action plans were undertaken in 20 of the 27 audits.

All IPCATS undertaken had action plans as described above, these reports were tabled and discussed at the W&C directorate local Hospital Control of Infection Group as per examples stated below.

IPCAT Audits were undertaken with more frequency than the tool required given the concerns and focus on infection control and improvement.

All Audits had action plans completed as per the dates below.

<table>
<tr><th>Year</th><th>Ward</th><th>Date of audit</th><th>Score</th><th>Date all improvement actions completed</th></tr>
<tr><td>2016</td><td>2a</td><td>01.02.2016</td><td>94</td><td>02.02.2016</td></tr>
<tr><td>2016</td><td>2b</td><td>13.09.2016</td><td>97</td><td>13.10.2016</td></tr>
<tr><td>2017</td><td>2a</td><td>10.02.2017</td><td>89</td><td>10.03.2017</td></tr>
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2017	2a	19.04.2017	87%	19.05.2017
2017	2a	04.05.2017	96%	04.06.2017
2017	2a	07.11.2017	93	07.12.2017
2017	2b	22.08.2017	94	22.09.2017
2018	2a	01.08.2018	96	02.08.2018
2018	2b	22.08.2018	98	22.09.2018
2018	6a (2a)	01.11.2018	94	01.12.2018
2019	6a (2a)	30.10.2019	97	30.11.2019
2019	6a DCU (2b)	18.12.2019	97	18.01.2020

Mins 13 September 2016.docx

Minutes 13 06 17.docx

The IPC audit reports are included in the sector/directorate reports to the senior management team for the Directorate which are tabled at discussed at the W&C Clinical Governance Committee.

2018-08-IPC Activity_W&C.pdf

IPC Activity_W&C Feb 16.pdf

The audit reports are also tabled in the report to the Acute Clinical Governance Committee and the IC committees

Acute Clinical Governance monthly

2018_10_ Acute Monthly IPC report.pc

		In 2016 the IPCT tabled an SBAR at the BICC describing the local responsibilities to ensure a clean safe environment. To support this a bed space checklist was created for use by nursing staff to ensure that the patient bed space was clean. A weekly assurance checklist was also developed for use by the SCN weekly to provide assurance that patient equipment is clean and safe. These forms are completed in ward 2A/ 6A.  Appendix 3 - CNPE - Weekly Cleaning Assu  nhs-ggc-bed-space-cleaning-checklist.doc The completion of these audit tools is monitored as part of the IPC audit programme. In light of the Vale of Leven Report and recommendations, NHS GGC IPCT developed a process by which key elements of SICPs would be monitored jointly by members of the Facilities team, IPCT and our public partners. The public partner would chose a ward to visit on the day. The audits were devised to allow direct observation of the clinical environment. Please see attached examples:  IPC Public-Peer Audit Tool Ward 2B.docx  IPCT Peer Public Audit Rpt Ward 2B.do  RHC Ward 2A.pdf
1412-8	5.3.2 Enhanced supervision	To ensure an understanding of the approach we would note the following; Enhanced supervision sessions were set up to ensure a multi-disciplinary approach (nursing, IPC, estates and facilities focused on scrutiny and real time action. This MDT process took place weekly and immediate actions and improvements taken. The nature of these sessions was supportive and improvement focused and consequently actions not always recorded. From late 2019 the paperwork was amended to include a section for completed actions. These are reported thought the 6A clinical review group. The process has proved effective at maintaining close working relationships and speedy

		responses to issues as they arise.
1453	5.3.3 Hand hygiene	A list of hand hygiene audits with dates were sent to the Review on 4.9.2020. In addition, the enhanced supervision process includes hand hygiene surveillance. Since 2008 all Senior Charge Nurses are required to complete a Hand Hygiene (HH) audit every month. This is linked to MQCIC and submitted nationally. 52 were undertaken locally between 2015 and 2019 All were above 90% with the exception of one which was 88%. In addition the HH co-ordinator was required to submit compliance data on a random selection of wards nationally for many years however this was stepped down. However importantly, NHSGGC continued to employ a dedicated HH coordinator (HHC) and in response to a HEI inspection recommendation the Board HHC undertook to conduct audits in area who locally reported 100% compliance to assure the organisation that this is being correctly audited. The HH coordinator undertook audits within ward 6A and n 2019 alone undertook 29 audits all of which were 95% or over. IPC audits also included HH and action plans were completed as required. When a HH failure was picked up on within the unit the member of staff was immediately alerted to this and the SCN incorporated it in to the ward safety brief and team meetings. The audits identified the professionals involved and were focussed on learning.
1470-5	5.3.4 Conclusion	In light of the above evidence we would consider this conclusion inaccurate.
1477	5.4 Environmental microbiological surveillance	There is no agreed national standard on environmental sampling but there is a local SOP. A detailed email was sent on 31.12.2020 detailing laboratory processes.

1490		Water samples were tested for all gram negatives by March 2018 and environmental sampling was directed by the LICD on the basis of IMT decisions, with action as per the above email sent 31.12.20.
1492-8		As already noted, a decision to take a lack of positive samples as indicating a lack of evidence rather than a lack of microorganisms in the environment, has major national implications for infection control. We would note that there is no national guidance on drain swabbing and there is evidence that other NHS organisations do not do it. The Interim IPC Director stopped the process early in 2020.(Email evidence available)
1505		This was undertaken at the behest of the IMT so systematic in that sense and, as previously highlighted, these were undertaken in real time for IMT decision making. Routine environmental sampling is a major resource issue and we are unaware of any NHS organisation doing it. Any guidance should come from HPS and national bodies. Serratia was added to the alert organism list within GGC on advice from HPS in 2016 and this organism did not appear in the NIPCM until 2017.
	5.5.1 Water testing policies and practice	 2a incident cupriavidus March 2(To ensure the GGC position is accurately reflected please note the below; HPS guidance on pseudomonas was issued in 2014 SHTM 0401 Part c which GGC adopted in 2016. The fact that HPS did not put it into policy until 2018 did not deter GGC from testing. Please see attached document prepared by one of the microbiologists in 2018 providing demonstrable evidence of testing.
1554-1566	5.5.2 Water testing at NHS GGC	To suggest there is no water testing strategy is entirely inaccurate. The GGC water sampling schedule was sent to the Review on 25.09.2020. HFS have signed off the testing regime with the Authorising Engineer (AE) affirming the position. This process has been in place since 2018. As noted the organisation have been testing for all Gram neg bacteria since 2018.

1559		The laboratory SOP has clear guidance on communication – see above re email. We would welcome evidence to show staff were denied access to water sampling/testing as none has been presented to GGC to date and inclusion of such statements without verification in a report of this nature is considered factually inaccurate.
1580 onwards		We request that this section be removed. Specifically: **Line 1582** All samples are booked in as potable and are reported according to drinking water standards. In the LIMS (Telepath) system POTABLE is the code for all such waters, other types of waters we receive are POOL and ENDOSCOPY etc. These codes determine how they are set up and what is reported as per the associated standards and SOP. **Lines 1584-1587** The 'target organism' is presumed to be taken from the column on the DMA part of the spreadsheet 'Analysis Required' and does not represent what was tested as this is information is from the DMA files (which we merged to the laboratory dataset to allow for location) and not from the laboratory system. The lab would look for and report everything (all or any Gram negatives) unless directed otherwise by the ICD. On occasions when a specific organism was requested by the ICD then most of the time that being isolated or not would be the only thing reported, again this would be under the direction of ICD.
	5.6 The likelihood that infections were linked to the hospital environment.	As noted previously, it should be made clear that the methodology used is not validated. The time frames used to link cases are unclear and it is not clear if non-hospital patient locations were being allowed for.
1613		There is contradiction here, the report states that patients with possible or probable environment related infections add up to 100% of the relevant cohort. This cannot be correct because 9 patients were in neither category.
1621-1626		The implication is that 'definite' links could have been made with more and better data. As previously indicated, GGC have made 2 definitive links (as stated in the email of 31.12.20) so it is unclear how the methodology actually worked and how conclusions have been drawn. Clearly, in the future, lessons will be learned in relation to the availability and

		issue of data quality but, as outlined, this is a complex area in an unprecedented set of circumstances which GGC was seeking to proactively address with input from a variety of external agencies and experts.
1640		It is unclear what the statistical claims here are based on and would benefit from clarification for accuracy and transparency.
1643-8		This is an inaccurate summary of the situation. This reflected when water tests were positive and is when NHSGGC took major action with reference to the water system.
1649-57		We would request that this paragraph notes that GGC took major and proactive action at this period. Supported by external agencies and national experts.
1652-1654		We consider this to be inaccurate. The control measures were instituted on the basis of the precautionary principle and should not be used as evidence of causality. This should be reflected for completeness and also the fact that GGC were responding to what was a very complex, evolving situation.

1674	**6. The impact of infection on patient outcomes** 6.1 Background	Inaccurate - there were 22 deaths
1808-1825	6.3 Details of the children and young people who have died	Key issue of accuracy and also potential for overall conclusions drawn. The report repeatedly states that of 21 deaths 2 were related to infection. One [redacted] and agree with the conclusion. It is difficult to identify the [redacted] and appreciate that patients must be anonymised. The report states that the second [redacted] died 6 weeks after an infection and it is difficult to agree that an infection 6 weeks earlier was causal in death. However, the report later states that [redacted] died within [redacted]. This helps us to possibly identify the patient. We think this [redacted] but had had a previous bacterial infection. If this [redacted] died of infection, he died of [redacted] and not bacteria. We appreciate that this may not be [redacted], but if so the [redacted] are of one opinion that the cause of death was

1816 and 1823		[redacted]. We would welcome the opportunity to discuss this with the Review team. If the reported third [redacted] who died in the early phase of a [redacted] to a patient who had a [redacted] and a previous gram negative infection, it is important to acknowledge that the [redacted] clinical team at the time was of the opinion that the main cause of death was progressive [redacted] disease. Although there is no doubt that the reported gram negative infection contributed to this patient's clinical worsening and admission to [redacted] in the weeks prior to death (as shown on the death certificate – although blood cultures were negative in the 4 days prior to death with antibiotic treatment), there was clear evidence (on MRI whole body done about 3 weeks prior to death and on persistently elevated and rising [redacted]), of an [redacted] disease (monomorphic diffuse large B-cell lymphoma on liver biopsy) with disseminated and progressing [redacted]
1859 1883	6.4.2 Datix system data	This refers to a patient with a megacolon from C diff and the wrong categorisation of the Datix. Again we can't confirm, or refute because we can't identify this patient, but again, we would welcome the opportunity to discuss this. This entry refers to the infusion of bacterial contaminated stem cells. Stem cell collections are tested at time of collection, processing and at infusion. Contamination is often at laboratory level and not actually in the product. Infusion of a contaminated product would be reported to the HTA which is the regulatory body. We can confirm that any contaminations whether in laboratory samples or product have been reported to the HTA. Furthermore we understood this review to deal with gram negative bacteraemias, so not clear on the point being made. All contaminants have been gram positive skin contaminants.

8. Areas of concern

	8.1 Data availability and data quality 8.1.1 Access to NHS GGC Information systems	As noted in 3.1 accurate timescale for data access. The process and timescales for the original ISA were as follows: 14/02/20 Caldicott Guardian and Director of Public Health Linda de Caestecker sought advice from DPO on DP/IG requirements re case note review. 17/02/20 Emilia Crichton, Deputy Director of Public Health asked the Board Data Protection Officer to put an Information Sharing Agreement in place 19/02/20 Draft ISA completed but further details were required from others to conclude the agreement 20/02/20 Meeting with Information Governance Team (Jackie Henderson), Professor Bain and others to discuss ISA and finalise information required. During the week commencing 24th February the Board Information Governance team discussed outstanding requirements and kept in touch with Profession Bain via email on 27/02 with regard to a key meeting planned on 03/03 with the Board Head of Information Service, Jonathan Todd and Dr Patricia O'Connor and Shona Cairns who were progressing things on behalf of Profession Bain. The purpose of this meeting was to discuss the clinical information required for review and to seek clarifications required to complete the Information Sharing Agreement. 04/03/20 Emilia Crichton, Deputy Director of Public Health, queried why so many people required access and asked if they could be given pseudo anonymised data. J Todd explained why this was not possible. 05/03/20 Emilia Crichton requested further detail on methodology on appendix in ISA which Jonathan Todd followed up on. **06/03/20 Information Sharing Agreement was signed off by Emilia Crichton** There were subsequent requests for changes and additions the majority of which were dealt with quickly. However, there were areas that took a little longer - the detailed timeline is set out in a separate tab refer to appendix. The Board's Deputy Director of Public Health, Emilia Crichton was initially concerned about the amount of people being given access and therefore she requested that all of the requests and changes were approved through her and not delegated to the Board Data Protection Officer. There has been learning from this exercise in that changes were not anticipated and with hindsight, to avoid unnecessary delays, a change process should have been considered and approved and this will be done for any future complex projects or enquiries. 02/3/20 Email from Dr Patricia O'Connor to Jonathan Todd – Head of Information Management Hi Jonathan, Thank you for your time and support this morning. We have made tremendous progress on sorting out

			the processes we will need to access the records required for the case note review. Shona will forward the HPS protocol under separate cover along with the additional individuals required for the GG&C accounts from an epidemiological perspective . From the PPT perspective the individuals requiring access to the clinical records and portal are: **Paediatric Nurse**: Mr. Peter Campbell, Associate Director of Nursing, NHS Lothian. Peter.Campbell[redacted]. **Paediatrician**: Dr Linda Clerihew, Consultant Paediatrician, NHS Tayside, [redacted]. **Haemato-Oncologist**: Professor Hamish Wallace Hamish (NHS LOTHIAN)[redacted]. **Infectious Diseases Consultant**: Professor Peter Davey [redacted]. **ICP Nurse**: Lesley Shepherd [redacted]. **Paediatric Pharmacist:** Dr Jacqueline Sneddon, Project Lead for Scottish Antimicrobial Prescribing Group, Healthcare Improvement Scotland, jacqueline.sneddon[redacted]. **Review Co-ordinator**: Dr Patricia O'Connor I already have access(including remote) I just need the permissions levels to access the clinical portal and trackcare patricia.o'connor[redacted]. Let me know if there are any other details you need. I look forward to next steps to test out access and use of the tools next week. Kind Regards Pat Dr Pat O'Connor RN, RM, BSc, MBA, PhD Honorary Professor University of Stirling Faculty of Healthcare Sciences and Sport Executive Director QI Discovery M:[redacted] email: oconnor125[redacted] skype:[redacted]
		02/3/20	The Board's eHealth Directorate received the names of those involved in the review and a request to set

		up accounts submitted on 3/3/20. Clarifications received from user provisioning team on 4/3/20 re level of access required. Confirmation of accounts set up was issued on 5/3/20. 02/7/20 Accounts were originally set up to expire on 30th June 2020 when it was anticipated the review would be completed. A request was received on 2/7/20 to extend access as work was ongoing. Access to accounts was extended on the same day (2/7/20). <u>It was however noted that on the 25/8/20 the Review Team and Board agreed to add additional system access request to the Information sharing Agreement. This would imply that at this stage there was a recognition that a deep dive into the laboratory system was required – as opposed to the clinical information contained within the case notes.</u> - Telepath (Board Laboratory system) - eViz (is a system for files shared through secure project within eViz Tableau, a server operated by NSS BI to support secondary use of data manipulation in order to carry out retrospective review) Access to both was approved by Emilia Crichton, Deputy Public Health Director on 1st September. Training and completion of access forms required for Review Team: • Hayley Kane (Infection Control Manager, NSS) • Professor Michael Stevens (Expert Panel) • Professor Mark Wilcox (Expert Panel) • Gaynor Evans (Expert Panel) 01.10.20 Marie Brown asked Wilma Kilroy to extend access for 4 team members until 31.03.21. 01.10.20 J Todd confirmed to W Kilroy that this access was required 01.10.20 W Kilroy confirmed to J Todd she would arrange this once she received the login names with M Brown and others cc'd in. However, no-one confirmed the login names to W Kilroy, so the accounts were never extended. The Board DPO was on sudden bereavement leave from 19.10 - 08.11 and access was approved the day she returned

2087		on the 9th November. However given there is a wider governance infrastructure and she has deputies who were known to the Review Team and an escalation within the eHealth Directorate/Caldicott Guardian route exists this feels like a breakdown in communications from both the Review Team and the Board and to highlight this in the review report feels uncomfortable for both parties.
2117	8.1.2 Environmental microbiology and facilities work data	See previous, we would appreciate it if this could be put context that senior management were not apprised of actual data needs for estates and microbiological sampling until well into August 2020, or told that earlier communications directly to GGC departments had not provided what was needed. Whilst not factually incorrect a conversation with appropriate senior management could have made this clear at the start of the Review process and it is unfortunate this did not occur. 2114 is misleading in view of actual communications that took place especially role of Interim IPC Director. First explicit data request via her was 4.8.2020 – earlier communications seen suggest 'chat' or 'meeting' with no clear ask.
		Full case note review labs Information:- Sandra Higgins, the Microbiology Service Manager & Elaine McCormick worked on data provided by DMA (3rd party) & Telepath extracts to identify every water sample taken during 2016 – 2020. An extensive piece of work was carried out, to marry up the Telepath data & DMA (third party data), to identify what location each water sample had been obtained from 2016 onwards where Telepath data was combined with data from DMA (Third Party Supplier responsible for Water Sampling). The reason for the delay was that all Telepath records prior to 2017 were manual and not electronic therefore there was a lengthy and manual process to review all paper records and marry up with samples and add to the requested consolidated data set. This was provided to Alastair Leonard on completion for submission to the review with the process undertaken explained to the Review Team. **Page 64 – Section 8.1.2 around 2101** **File Description** **Final Submission Dates**

		2015 Potable Water Samples 13/11/2020 2016 Potable Water Samples 13/11/2020 2017 Potable Water Samples 13/11/2020 2018 Potable Water Samples 13/11/2020 2019 Potable Water Samples 13/11/2020 For Potable Water samples this involved merging LIMS (Microbiology Telepath Records) & DMA external company records. We also reviewed these once completed alongside the paper records to ensure there were no omissions or inaccuracies due to merging different data sets. In addition to this pre April 2017 the laboratory was working on a paper based system and only introduced the LIMs system therefore all records up to that date had to be transcribed from paper records. **File Description** **Final Submission Dates** 2015- Nov 2020 Environmental Surfaces 13/11/2020 **File Description** **Final Submission Dates** 2015 Reference Lab File 16/12/2020 2016 Reference Lab File 16/12/2020 2017 Reference Lab File 21/12/2020 2018 Reference Lab File 10/12/2020 2019 Reference Lab File 11/12/2020 The reference laboratory files involved extracting samples from the LIMS that had isolates referred to PHE for typing. To ensure nothing was missed GG&C requested from PHE all Gram Negative Isolates that had been referred to them from the QEUH. This formed the master files that GG&C then had to request administration staff to transcribe the complex reference laboratory results. This was a long process due to the amount of information and as we stated is not

		something that GG&C staff routinely do. However the Case Note Review report implies that (page 15 449 – Communication and engagement with NHS GGC) requesting critical data for Panel consideration began 8.4.20 and continued until a final set of data was received on 21.12.20) but doesn't clearly articulate the work required to map a vast dataset of a 3rd party to that data which the Board was able to generate and provide. Again under 3.1.1 the report outlines (line 464) that data extraction had been successfully established, but (line 470) the extent of the lack of data to support the Review was becoming apparent. All these points do not actually reference the work GGC was undertaking to marry up external and internal data sources for extraction however the report is written to imply multiple requests were not fulfilled – with no recognition for the size and scale of the task - despite the time taken for DMA to submit data as they had also had their own manual process in place and it took a few meetings led by GG&C in order to get the data in the required format. **Reference Laboratory Reports:-** Reports for isolates sent to external Reference Laboratories, for both patient & environmental samples were stored locally. Any reports associated with a patient, were scanned locally onto Dart (an internal laboratory system which associated a record with the original Telepath laboratory number) and scanned into the Board electronic record so viewable by all. This allows scanned documents to be viewed in tandem with the Telepath result. Reference Laboratory results are not transcribed into Telepath. A report is issued saying the report is available on Portal & the original Reference laboratory result will have been scanned to Portal against the patient record. This is in keeping with UKAS guidelines and practice in other NHS Boards.
2128-2138 2130 2131	8.1.3 Laboratory information systems	The request for access was not cascaded down to the IPC Team. ICNet is a Live application and all users have had training on how to access and use the system. Ann Kerr received an ad hoc telephone call (August date) from Patricia O'Connor asking how best they could obtain the required information to assist with the Oversight Board Review in the easiest format for all. Individual patient records can be easily converted to a pdf format (Complete patient records report) and this was agreed by Patricia O'Connor to be a viable solution. The requested pdfs for each of the five cases were provided timeously and

2137		contained all information held on ICNet for that individual at that point in time. We consider this to be supposition and not factual. Ann Kerr had explained to Patricia O'Connor that the ICNet Complete patient records report held all information recorded on the system for that patient. Read only access was given to five Oversight Board review team members on the day of request (04/09/2020) by the IPC Data Team, however only one person has accessed the system (audit trail available)  Request for access to ICNet.doc
2169	8.1.4 IMT and PAG meeting records	Timeline of IMT actions September 2018-October 2019 as sent to HPS in 211119 action plan was sent to Review 14.10.2020 This requires to be reflected in the paragraph.
2205	Also 8.6 Adverse event reporting	We acknowledge that the SOP states that the incident should be reported on Datix. However, Datix is really a tool for the investigation of individual cases and we are not aware incidents in other boards are recorded on Datix. The requirement within the SOP has not proved workable and will be removed once discussed with the BICC.
2242	8.2.2 Compliance with the process	
2233-34		The incidents were investigated in line with national guidance available to GGC and all incidents were reported to HPS in line with guidance. The progression of an incident from the PAG to the IMT was at the discretion of the LICD using the available data at the time.
2242		The term HAI is a national term.
2251		The report notes reservations on the use of SPC charts, however this is the recognised and advised method used by HPS/NHS Scotland which therefore presents challenge to GGC when we were taking the advice of our national experts

		in this situation. This requires to be reflected. • The rate per 1000 OBD SPC chart templates used in the October 2019 HPS report (Review of NHSGG&C paediatric haemato-oncology data) report were provided by HPS (ARHAI) to the IPC data team following report publication. We have continued to populate these each month using bed occupancy data from NHSGGC Business Intelligence. • Run charts with patient case numbers have also been produced since November 2019. • These charts are shared with W&C General Manager and Lead Nurse as well as IPCT. • SPC charts are not used solely as an individual means of data reporting, but are helpful in providing a visual graphical display which shows problems (but not the cause of the problem) and aid quality improvement over time. SPC charts are used extensively in healthcare but this was only one method used in the analysis of cases. In the HPS review published in November 2019 HPS commented "*Reviewing monthly SPC charts has been shown to be an appropriate method in identifying triggers and outliers when a stable period can be used to set the mean. In this review, the crude incidence rates before and after the move did not reflect the variation in incidence over time within this population. The changes in activity, in particular the occupied bed days, have highlighted the importance of considering activity when interpreting charts and where possible to use incidence rates in SPC charts. The use of grouped case definitions have allowed the data to be reviewed without reporting bias of selecting significant organisms or over reporting when multiple organisms are isolated from the one patient*." In addition to SPCs during the water incident, epidemiology curves and timelines were also used. Evidence was presented to clinicians on 26.09.19. The current methodology promoted by HPS and now used in 6A, PICU and NICU are chart based and add in occupied bed days. In addition triggers were in place from 2017 which were entirely dependent on small numbers. Part of the learning from these incidents and indeed reservations from the clinicians (set out below) led to a new methodology recommended by HPS and is now being piloted by GGC with evaluation by HPS. In the IMTs, there was debate around this methodology among HPS, CPHM, Clinicians and microbiologists and this is reflected in comments from clinician below. In October 2019, a retrospective RCA was done by the Consultant Nurse in IC along with clinicians from the unit. From November 2019, all cases now subject to that approach.

		The IMT minutes of 14/11/19 show the controls agreed as part of re-opening the ward; this was then directly approved by the CNO and indeed the Cabinet Secretary thereafter. This methodology in this context was not relied upon as all organisms in all categories were included in the investigation. Descriptive epidemiology was supplied by public health colleagues and reports were produced by HPS in 2018 & 2019. *Clinician comment.* Lines 2251 and 2416: Despite the fact that it should not be expected to be an area of their expertise, clinical staff were knowledgeable epidemiological principals and made robust representation within the IMT that SPC charts were methodologically flawed when trying to confirm or refute an outbreak in these circumstances. They were similarly clear that the conclusions that resulted when this methodology was used, despite their reservations, had no validity.
2254		This data was analysed by HPS and we are not clear what point is being made here.
2258		Example 8.2 The fact in this respect are noted below. Klebsiella is <u>not</u> listed as an alert organism in the NIPCM. In 2017 when the four gram negative organisms were added Klebsiella was not one of them. In 2018 HPS advised a microbiologist to add Klebsiella as an alert for this cohort of patients and this was done. There is an expectation that if this was occurring in a specific area that clinical staff in that area could raise concerns and this would initiate an investigation. In 2018 the cases of Klebsiella were included in the overall timeline of patients (attached) and were part of the incident review. (Email confirming when Klebsiella was added to the surveillance system and appendix 13 of the national manual (downloaded today)

		 Master - Associated patient cases - Water  redacted email.pdf  2021-2-19-appendix-13-final-v14.pdf
2260-2278 2260		This is factually inaccurate and misleading in the following respects; • It is not clear that Klebsiella were higher than expected as this is the second commonest cause of bacterial infections and we note 'apparent' is used when describing clusters; • It is not included in the NIPCM alert system for NHS Scotland but GGC added to its alert system in 2018. • The cases were included in the 2018 water incident master copy of patients and discussed – see above master list. • Water sampling has rarely identified this organism. Example box 8.2 • ..*There was no investigation into an increasing number of Klebsiella bacteraemias encountered between 2016 and 2018*. This statement is mutually contradictory to the statement in 1210-1212 • *Whilst Klebsiella bacteraemia is not infrequently seen in this patient population, and may be endogenously as well as environmentally acquired, we would have expected the evidence apparent to us for an increasing number of infections, to have triggered a formal investigative process.* Again this statement is mutually contradictory to the statement in 1210-1212. Investigation of incidents followed the National Manual. Note: In all water testing in 2018 and 2019 of 5,057 samples taken in QEUH and RHC 3 returned Klebsiella spp. Of these 2 of

2262		these samples were taken from the basement tank room and so represents raw water that has come into the hospitals from the mains. One sample was found from a water outlet in Wd 9A QEUH. As stated from March 2018 all water was tested for ALL Gram negatives.
2271-2278		It should be noted for accuracy that national guidance was followed in investigating the incidents. Again we were being supported by national agencies and water experts. GGC will be piloting a new approach on behalf of NHS Scotland with HPS which will consider this approach. From 2018 all positive gram negative BC were considered by the IMT. The HPS report from 2018 clearly states that *"Between the period of 29th January and 26th September 2018, 23 cases of blood stream infections (11 different organisms) with organisms potentially linked to water contamination were identified." So all organism potentially linked to the environment were considered".* In addition the October 2018 HAIRT report, which is prepared for the NHS Board and is a public documents reported as follows: **OUTBREAKS / EXCEPTIONS** (Reported are those that are assessed as AMBER or RED using the HPS HIIAT tool) **February-June 2018** **QEUH and RHC** – Bacteria in Water System. Returned to HIIAT RED on the 13th September 2018. As of 28/09/18 the incident has been HIIAT AMBER. The issues relating to this on-going incident are both complex and evolving. The safety of the children is of paramount importance and the key consideration in all actions being taken. Members of the senior management team are fully engaged with the clinical, infection control and facilities teams and national agencies/ advisors in both the management of the situation and the implementation of a robust and permanent solution. We reverted to normal triggers for environmental Gram negative bacteria in August 2018 following a programme of drain cleaning and replacement. On the 5th of September the water Incident Management Team (IMT) was reconvened to discuss three additional cases

		of bacteraemias likely to be associated with drainage issues in ward 2a. As of 27/09/18 6 additional cases have been identified (1 Enterobacter, 1 Klebsiella, 2 Stenotrophomonas, 1 Serratia 1 Stenotrophomonas/Chryseomonas) .Total cases associated with the water incident are now 23. Organism breakdown is below; • 1 Cupriavidus • 1 Pseudomonas • 8 Stenotrophomonas • 7 Enterobacter • 1 Klebsiella • 1 Pseudomonas/Stenotrophomonas • 1 Serratia • 1 Stenotrophomonas, Acinetobacter • 1 Stenotrophomonas, Chryseomonas • 1 multi: Pseudomonas, Stenotrophomonas, Acinteobacter. Due to further bacteraemias with water associated organisms despite implementation of extensive infection control measures, the recommendation from the IMT was to decant the ward. This was to enable a detailed assessment of the source and remedial measures to be undertaken.
2277-2278		It should be noted that reviews were in fact undertaken with basic descriptive epidemiology used as to map all infections among the haematology oncology paediatric patients.
2276-2295		This appears to present a retrospective judgement which does not provide context nor detail of how cases were highlighted, indeed the HPS report of 2019 reviewed this in detail. GGC followed national process, engaged the expertise of HPS and the Scottish Government HAI/AMR Policy Unit throughout this period and is now engaged in piloting a new approach with HPS.
2296		Note; List of IMT actions from September 2018 sent 14.10.2020 to Review (see above – same as sent to HPS 211119).
2311		Example 8.3 This is a misleading example as it suggests GGC acted outwith national policy and did not follow advice. GGC did

		report and investigate all individual cases after we were advised to include them in the alert list by HPS in 2018. The CNO had invoked the national framework tool on 26th March 2018 giving HPS a leadership role. HPS and the Scottish Government were closely involved and received and advised on reports. It would be helpful to put this into context: • Enterobacter was added to the GGC alert list in 2018. • The HIIAT Score was not queried by HPS and seems to us that this is a retrospective judgement. • 3 of the 5 cases were not considered HAIs – this was consistent with national methodology with unique typing of 2 cases. • All cases were added to the master list at the time of all cases to HPS for the water incident.  HIIORT 2A Enterobacter cloacae  HIIORT 2A Stenotrophomonas B Enterobacter – 3 of the five cases were not considered to be HAI although all considered in the reporting of the incident to HPS. To apply this definition at this time would be entirely consistent with established methodology (national prevalence study use this definition). Two patients had been typed at this time and both came back as 'unique' which indicated that this type of microorganism has never been isolated in the hospital before. All of these were considered in total see master cases above ref line 2258 and in the report to HPS were all cases have been included as a single issue.  HIIORT Water system incident 6.6.1  HIIORT Water system incident 18.9.
2334		Example 8.4 We would request that this example is reviewed. The IMT was stepped down with the full involvement of HPS and the Scottish Government HAI/AMR policy unit: the detailed reasons are provided in the minute with clear triggers established and agreed and set out below;

		- The SG HAI policy unit had requested directly all information by the end of 25th June for review. In addition, they were briefed directly by HPS after each IMT. They did not query the information nor the decision to step down the IMT. -The 2 cases referred which are referenced were not HAI cases and indeed one came from another NHS Board. Two further isolates of Enterobacter cloacae were found in July and August - these cases were not HAI and therefore were not a trigger and would not have resulted in a PAG/IMT. The July case was from another hospital and was previously positive in a stool specimen (endogenous infection) the second case was admitted on the day of a blood culture, clinically septic and rigouring. Last visit to the unit was to the day case area 7 days before. Triggers would have been: • One HAI bacteraemia • Two infections other than BSI in a 2-week period • Three colonisations in a 2 week period • General increase in environmental Gram negative organisms i.e. mixed organisms, on advice of ICD In response to the question, *why was the IMT stood down*?, we would draw attention to the IMT minutes of 21/6/18 at which HPS were in support. "*The group agreed that for the next 2 weeks if another case is reported then the IMT will be reconvened. If no cases after 2 weeks then the IPCT will resort back to their normal surveillance of 2 cases that fit the case definition*." The minute also notes that the ''*Scottish Government has requested all HIIORTs and PAGs regarding RHC including any green scoring HAIIT for 2018 to be sent to themselves by close of play on Monday 25th June*." This highlights the involvement of external agencies.

2349	8.2.2.3 Adequacy of IMT meeting records	• Many of the issues set out in this section highlight the areas which the revised outbreak policy and SOP seek to address: there was a review by the Board following concerns highlighted by members of the IMT in September 2019 around inappropriate behaviour and lack of structure to the IMT. There are minutes of a meeting which took place on the 20/8/19 which may warrant discussion with the Review Team. • The revised outbreak policy and the revised SOP seeks to provide more robust measures to address this.  Item 5.4 - Outbreak SOP V9 (draft) (OCT  Item 5.4b - Outbreak SOP.docx • A full response and collation of timelines was sent to HPS in late 2019 of the whole incident in 2018 and 2019.  211119 NHSGGC QEUH Ward 6A Actic
2386		It is incorrect that water was only tested once, and that an Enterobacter was isolated over this time period. Over the 10 month period 1.11.18 to 27.9.19 we tested 1,994 water samples. All water samples at this period would have ALL Gram negative organisms that grew identified to species level. Of those 1994 samples, 399 had bacterial/fungal growth of which 82 had Gram negatives identified:  GNB Summary 11.18-09.19.xls The conclusion in lines 2389 and 2390 requires review and is factually inaccurate.
2391	8.2.2.4 Upward reporting from IMT	The final IMT report for the water IMTs (April 2018) was sent to the Review 4.12.2020 Detailed email sent to Review 11.12.2020 discussing this issue. In view of the HPS review in place over 2018 a Hot

	meetings	Debrief at this point seemed superfluous as a national review was underway as agreed with HPS and the Scottish Government who were supporting the organisation throughout. Email evidence available. 2018-04-13 email.doc HIIORT 2A Water supply 130418.doc
2397		The AICC report to the Board Infection Control Committee. Comments in respect of organisational governance are not based on a sound understanding of the GGC structure and we would be happy to provide further context if this would be helpful.
2400-2415		Example 8.6 requires to be reviewed, the use of the tem 'underplay' is inaccurate and we believe a misrepresentation of the facts. **Background** • We believe that the example given refers to the HAIRT report presented to the public Board meeting on the 17/10/17. This is a meeting held with around 32 board members with both the press and the public in attendance. The paragraph was entitled ***'Women and Children's Directorate – Royal Hospital for Children; Ward 2A (haematology/oncology).*** • The conclusions expressed in those paragraphs suggesting underplay and lack of understanding, do not accurately reflect the factual position and are, in the Board's view, misrepresented and we consider that it should be reviewed and amended: a detailed timeline of the board committees as well as HPS advice is set out below: **Timeline:** • **26/07/17** Two cases of stenotrophomonas on RHC ward 2A in eight days. Problem Assessment Group (PAG) meeting held: Healthcare Infection Incident Assessment Tool (HIIAT) status Red, Healthcare Infection, Incident and Outbreak Reporting Template (HIIORT) completed and sent to Health Protection Scotland (HPS). • HIIORT updated 13 times between 26 July and 15 August 2017.

- **15/8/17** Incident closed as reassessed as status Green.
- [redacted]**/8/17** Patient sadly died.
- **4/9/17** e-mail from Lead Infection Control Nurse to Dr Lisa Ritchie, HPS consultant nurse, informing her that the patient had died and asking if any further action was required. [full email trail at Reference 1]

  'Hi Sandra,

  Thanks for letting us know that this patient has unfortunately passed away. As discussed on the phone, unless there was any anticipated concerns/issues with regards to the infectious agent or press interest then HPS would not take any further action on this information as this incident was closed three weeks ago having been reassessed HIIAT Green.'

- **4/9/17** Acute Infection Control Committee (AICC) meeting - IPC summary paper gives a detailed summary of 2 stenotrophomonas cases with dates, downgrading of HIIAT to GREEN after discussion with Health Protection Scotland, outcome as at 15.8.17. [Reference 2]
- **9/10/17** Board Infection Control Committee (BICC) minutes record:
  - At Item 4 Matters arising***: 'In Ward 2A there were two cases of Stenotrophomonas maltophilia in July and one of the patients died. It was noted that this patient*** [redacted] *the death certificate. Pamela advised that Infection Control have been monitoring this ward closely, and had undertaken focused work with ward and facilities staff on environmental cleanliness and clinical practice.' Discussion at this point on line care and the work of the Quality Improvement Group working in this area; Dr Armstrong requests Jen Rodgers to provide an update on ward 2A at the next meeting.'*
  - At Item 6.5 Recent Outbreaks/Incidents: *'Two cases of Stenotrophomonas maltophilia in a ward at RHC. One patient died and this was recorded on Part 1c of the death certificate. Meetings were held and HPS were informed. The HIIAT for this was RED and then Green. Both isolates were different types and no further cases were reported. The incident was closed on 15th August.'* [Reference 2]
  - **17/10/17** Public Board Meeting (see above) [Reference 2]
  - **6/11/17** Acute Infection Control Committee**:** 2 stenotrophomonas cases in 2A discussed. Notes work in

		ward 2A to improve central line infection rates. [Reference 2] • **27/11/17** Board Infection Control Committee: Detailed update on line care improvements and environmental issues in RHC ward 2A given. [Reference 2] • **5/12/17** Care and Clinical Governance Committee (CCGC) discusses a detailed 27 point infection control action plan which includes references to ward 2A actions on line infections. [References 7 and 8] **Subsequent meetings with discussion of this case or relevant issues arising from it:** • **June 2019**: Scottish Government debrief meeting on infection incidents with boards: NHSGGC raised the issue in the presentation of the conflict between patient identification and accusations in the media (slides 13-18). Other boards set out the same dilemmas. [Reference 3] • **26/11/19:** Full Board Seminar: Full discussion in a presentation to a Board seminar of the patient deaths receiving media scrutiny. Slides aide memoir to Deputy Medical Director (Acute) who presented cases.[Reference 4] • **13/02/20**: Meeting of IPC subgroup of Oversight Board. The full governance of this stenotrophomonas case was discussed at this meeting with a paper [Reference 2] and a presentation (slides 17-20) [Reference 5] given to the subgroup. The minutes [Reference 6] show other areas of enquiry but there were no comments then or subsequently that NHSGGC had underplayed or lacked understanding of the incident. (It was agreed that comments would be received within 1 week after the IPC subgroup had had a chance to review the papers and nothing has been received to date). **Based on the timeline set out above, NHSGGC's position is summarised and is justified by the factual background:** - 1. The AICC as well as the BICC scrutinised this case and incident, after the case was closed on 15/8/17. The BICC (in October) asked for further actions in order to provide assurance – this was followed up at the November BICC. 2. HPS had no further concerns and this reflects the information available to them and to NHSGGC at the time. In

		2017 it seemed that the infection was a complication of the patient's serious underlying illness and the possibility of contamination of the water supply was not raised until March 2018. 3. The HAIRT is presented at a public Board meeting where there is a need to ensure awareness of infections but no requirement to discuss individual patient details (which would be potentially unlawful for patient confidentiality and Data Protection reasons). This is in line with practice in other NHS boards in Scotland. 4. In 2017 there was a review of this case and there was a dilemma as to whether public interest outweighs patient and bereaved family confidentiality. In this case, the ward and speciality were clearly identified, it is a rare infection within a small cohort of patients, and the patient had very recently passed away after an admission to the ward and Paediatric Intensive Care Unit (PICU): this is a very low level of aggregation which means that any public discussion of the case may have directly or indirectly identify the individual and family involved. The identification of specific individuals has occurred through social media in relation to a very small groups of patients since 2017. 5. As media interest has increased, this has become an even more difficult issue and indeed one on which NHSGGC sought advice at a debrief session held by the Scottish Government HAI/AMR policy team with other NHS Boards in June 2019 following an incident involving Cryptococcus infections. Many NHS Boards agreed that they also protected patient identity in such circumstances and felt that this was the correct course of action. In these circumstances we consider that lines 2400 to 2415 represents a conclusion that is without foundation based on the facts. The evidence reflects a contrary position that there was no underplay and the position was fully understood and sought to be addressed. This conclusion should be withdrawn or at least amended to reflect the accurate position. We would draw your attention to the following additional points that support that position: - 1. NHSGGC has a full governance trail demonstrating discussion and actions taken and followed up both at Acute and at Board level meetings. **This is not reflective of underplay or a lack of understanding.** **2.** HPS at the time were not concerned and were content that no further action was required. **This does not suggest underplay by NHSGGC given the information available at the time.** **3.** Our practice is in line with all other NHS Boards in Scotland and national guidance and seems reasonable given the situation and advice at the time in 2017. **This does not suggest underplay by NHSGGC.**

		4. This incident and case was fully explored by the IPC subgroup of the Oversight Board, as is within their terms of reference, and they were content with the governance process described at the time. **This does not suggest underplay or lack of awareness in the eyes of the IPC subgroup who considered all of the governance evidence.** **References** (available if required) 1. 2017-09-04 Email from Lisa Ritchie to Sandra Devine 2. Governance timeline outlining discussion of the 2017 stenotrophomonas cases at NHSGGC committees over 2017 [compiled for the Oversight Board IPC subgroup for their meeting of 13.2.2020]. 3. June 2019 presentation by NHSGGC Board Medical Director [see especially slides 13 onwards] 4. 2019-11-26 Board seminar presentation on infection control and recent media scrutiny [see slides 13-16] 5. 2020-02-13 Presentation on NHSGGC infection control made to Oversight Board IPC subgroup meeting [see especially slides 17-20] 6. 2020-02-13 Minutes of Oversight Board IPC subgroup 7. 2017-12-05 CCGC minutes [see item 8] 8. 2017-12-05 '27 point action plan' paper
2489-2515 2495	8.3 Microbiology and IPC information systems 8. 3. 1 Telepath and bacterial typing	We would request a review of the statements made in this section. Whole genome sequencing (WGS) currently provides the most robust microbiological evidence and is already in use in investigating outbreaks. We would appreciate acknowledgement of how GGC used genome sequencing based on the advice of our local and national experts. GGC and NHS Lothian were recently nationally designated for WGS for COVID/other viruses. '25 SNPs difference' is from the international literature. We did ascribe limits of differences between strains, where such data exists. In the case of the steotrophomonas sequencing, we used the already described cut off of 25 SNPS

2498 2514 2512-3		that had been published by (Steinmann J. 2108. Analysis of phylogenetic variation so Stenotrophomonas maltophilia reveals human specific branches. Front Microbiol. 9.806 doi 10.2289/fmicb.2018.00806) We have data that when multi-picks are taken from a source isolation plate from an environmental water sample that when multiple colonies are compared the SNP difference between colonies 4-25 SNPs. Within our sequencing data of stenotrophomonas, in most cases clinical cases of infection had between 4-600 SNPs difference. Our conclusion is that this is sufficient genetic distance to show non-identity. Over the period 2018 and 2019 5,057 water samples were taken in QEUH and RHC and tested for ALL gram negatives. From these 74 grew stenotrophomonas. We agree that the sampling was not all systematic, but it was extensive, prolonged, reactive to circumstances and was looking for ALL Gram negative organisms. As a result of the extensive testing done, and the laboratory processes that looked for all Gram negatives, and the use of TVCs to identify "statutory breeches", our view is that if an organism was not grown it was not present. Thus in the case of stenotrophomonas that 2-3% of all samples grew this organism, this represents the contamination rate. It is also noteworthy that a number of these stenotrophomonas were isolated in the pre-filter stage of the basement water tanks i.e. they have just come in from the Scottish Water mains and there is no evidence that these strains have been found in the hospital system. We believe that this data should be included in the report, the technique is proved and should be included in categories and hypothesis. From March 2018 all water samples were tested for ALL Gram negative organisms which were identified to species level over the period of the review. The cupriavidus work was done at pace to help the Review team, contrary to how it is portrayed with the report.
2519	8.3.2	For accuracy it is important to note that all members of the IPCT have access to the ICNET system but this is only one way that communication occurs within the team. Each local team meets at least weekly, ICNs are in continual contact with the ICDs and we are happy to supply evidence of same. IPCT meet monthly to share information and learning

		across the board area. As an example throughout the recent pandemic the GGC team has met three times per week to update each other on issues encountered and solutions.
2545		Email from ICD to IC Data team confirming the inclusion of enterobacter (and others) onto the alert system for ICNET in 2018. Email held
2564- 2570		We have significant concerns about the situation described in lines 2564 to 2570 and consider it to be judgemental, unbalanced with no effort sought to understand the facts. *….but we have also seen evidence that Infection Control management within NHS GGC actively sought to discourage this – a position that seems entirely inappropriate. Whilst it might be argued that this could be a workload issue, and that direct patient care was not adversely affected, this stance would have excluded the IPC Team from the management of some Gram-negative environmental infections at NHS GGC, which, at the very least, limited awareness of the problem. More importantly, perhaps, it may also reflect a culture of denial about the nature, scale and importance of these infections within the organisation*. We are of course unable to see this evidence however the Review team should be made aware that in 2018 several members of the IPCT senior nursing team met with the Royal College of Nursing with concerns about the behaviour of one microbiologist in QEUH. The RCN thereafter met with the GGC Board Nurse and Medical Director to advise of the intention of raising a grievance through the policy. Following discussion it was agreed to resolve through early resolution resulting in alternative contact arrangements between the microbiologist and the ICNs.
	8.4 Clinical records	Comments regarding clinical records require further consideration. It is not clear why such a critique of systems is included within the report. This situation would be replicated within most Board in NHS Scotland but is recognised within GGC as an area for continual focus for improvement. The below information may assist understanding.
	8.4.1. The Clinical	• Generic continuation - No documentation is filed under Generic Continuation. Notes that are typed directly into Clinical Portal are either - IP Consultation, OP Consultation, Remote Consultation or MDT. These notes are

Portal

2620

filed under speciality in clinical portal. Notes that are scanned into Clinical Portal are filed by IP Medical Note, Nursing Assessment, AHP Assessment, Anaesthetic Record, OP Note, Drug Administration Chart, Consent. These are filed under the discharge speciality. There is a Generic Continuation Sheet as an eForm - this is historic and is no longer used but still visible.

o Clinical Portal indexing

Divider Tab	Clinical Portal Indexing			
	Folder	Sub folder	Service	Date
Medico Legal	Notification and legal documents	Legal notice	Acute specialties GGC	Document
Anaesthetic notes	Intervention records	Anaesthetic record	Anaesthetic	Discharge
Medical notes	Clinical notes	Inpatient medical note	Specialty at time of discharge	Discharge
Consent Form	Notification and legal documents	Consent form	Specialty at time of discharge	Discharge
Operation notes	Intervention records	Operation note	Specialty at time of discharge	Discharge
Nursing notes	Assessments	Nursing assessment	Specialty at time of discharge	Discharge
AHP notes	Assessments	AHP assessment	Specialty at time of discharge	Discharge
Medicines and Prescribing	Medication	Drug administration chart	Specialty at time of discharge	Discharge

NHSGGC operates a distributed scanning model for OP and IP / DC attendances / admissions which was implemented in a phased way from 2013 onwards. This process means that the patient's paper health record was locked down and all attendances from the implementation date forward are scanned into Clinical Portal.

For inpatients each patient has a scanning folder created when they attend hospital which stays with them throughout their admission. The folder is divided into different indexing sections which ward staff will then file documentation appropriately within. The Filing within the scanning folder will then determine the filing within the clinical portal system when the record is scanned.

For the majority of inpatients, the folder will be scanned in totality on discharge for the whole episode of care. Our SOP determines that records should be scanned by discharge date to allow ease of reference. A QA process is in place to

		audit compliance within the scanning hubs. For long stay inpatients incremental scanning is used whereby at regular intervals records will be scanned to clinical portal rather than waiting on the patient being discharged. Some patients can be in our wards for over 1 year and therefore managing in a paper-based system on a ward for that length of time would be unmanageable, In addition it would mean where a patient is transferred to another area of the hospital for example ED for an accident or injury the patients notes would not be available electronically. The incremental scanning process will mean patient episodes will be scanned in phases and therefore not under discharge date. The scanning team will visit all wards twice per day to collect scanning folders of discharged patients and return these to the centralised scanning hub on site for preparation and scanning within 24 hours of pick up. Documentation is scanned under discharge date and then goes through a QA process. Thereafter paper copies are retained for 6 months and then destroyed. There can be occasions when records are returned and scanned but later turn out to be incomplete. In this scenario given the episode has been scanned already, the medical secretarial staff would be responsible for scanning the loose documentation relating to the episode of care, the guidance in this scenario is that this documentation should be scanned under episode date of discharge , however this would appear as a second episode for the same discharge date. It is possible that in this scenario some staff have scanned this information under date scanned rather than discharge date which could in turn lead to notes appearing many months after discharge. Find attached (in appendix) the QRG and also the Incremental scanning process documents. Clearly the Board would like details of individual case records to address where this was identified.
2682	8.5 Patient location records	Process for bed closures – see attached QRG. Bed closures are also reflected in Microstrategy dashboards. If processes were not followed this will be reviewed. However the key issue is that no at risk patients were seen in 2b when it was being used for pre assessment. ICNet has a surgeries tab which contains all theatre activity, including theatre location, if this information is entered

2690		locally on the theatre information system (Opera). Users who had access to ICNet would be able to easily retrieve this level of details and this would also be contained in the Complete patient records report (pdf).
2776	8.7 Morbidity and Mortality Reports	17 Morbidity and Mortality Reviews were sent to the Review. Current narrative inaccurate.
2784/2784		This is inaccurate, the work was not in response to questions from the Scottish Government as clarified in email sent to M Stevens on 11/12/20 referring to an attachments and noting …*A further report, in the form of a letter, from Dr Chris Kidson. This was requested by Jamie Redfern – although the letter states this was for the Scottish Government – this was not the case but it was rather to formally answer specific questions internally.*
2800		To ensure accuracy we confirm that there is in fact a systematic approach to use of incident reporting - Datix are discussed at the CGM, learning points identified and highlighted key points disseminated via Schiehallion Newsletter. The summary reports are available but were not requested.
2834 2842-8	8.8 Central Venous Line Care 8.8.2 Observed CVL Management	This section deals with CVL lines. The narrative quoting an informal discussion through email, is out of context and clinical discussion should have been held at the routine meetings with the Haem-oncology team. Many of these children have had multiple lines and placing of a further line challenging. It is for this reason that every effort was made to salvage lines. Locking line is an accepted practice. When used they are then by definition challenged. Any delay in removing lines is due to theatre/surgical availability. Challenging the lines is a practice where if a child had a pyrexia they would stop using the line, insert a cannula and use that, then a few days later 'challenge' the line by taking more blood cultures and flushing, gradually using for fluids and medications. This practice is about line salvage so treatment can continue. It was discussed at the QI group (set up in May 2017) and we worked from there towards a change. Microbiology and other representatives within the group agreed to continue to use a line or remove a line depending on the clinical and microbiological status of the

		child". Clinical teams did not continue to try to salvage a line when the advice from microbiology was to remove it. Rather both teams started from a view point that line removal was the preferred option for children with Gram negative line infections. However individual patient details may make an attempt at line salvage preferable or inevitable. This was always discussed with colleagues from microbiology and their agreement to this strategy was obtained.
2889	8.9 Other aspects of clinical care 8.9.1. Antimicrobial prophylaxis	This section relates to antibiotic prophylaxis. It omits the meeting between clinicians and microbiology in which ciprofloxacin prophylaxis was discussed. It was noted that there was no evidence for prophylaxis in the setting (prevention of environmental gram negative infections) but was instigated as one intervention to halt the number of environmental gram negative infections. The report also omits the meeting of the prophylaxis groups which included representatives from the clinical team, ID, microbiology, pharmacy and nursing who reviewed the literature regarding prophylaxis and implemented a plan to discontinue cipro prophylaxis and instigate taurolock line locks for CVLs and ports. There is on-going audit of line associated complications.
2912-17	8.9.2 The impact of the organisational response on the delivery of clinical care	We would be glad to work with MSN in doing a review.
2947		MSN were fully briefed over the incidents which are on their risk register

9. Evidence of Good Practice

10. Summary of findings and recommendations for action

3015 and 3018	10.1 How many children in the specified patient population have been affected, details of when, which organism etc?	See previous re 1 patient death – requires review.
3032-9	10.2 Is it possible to associate these infections with the environment of the RHC and the QEUH?	See earlier response re data availability and quality.
3100		This section omits the regular review and discussion of Datix at the departmental clinical governance meeting which includes learning points and subsequent dissemination of information in the form of departmental education meetings, newsletters, safety brief etc. This should be reflected.
3137-3143 3207	10.4 Recommendations Recommendation 1 Overall management of gram-negative environmental infection in paediatric haemato-oncology	It should be noted that there is already in place a group that uses RCA methodology to investigate all environmental Gram negative infections. It has representation from Haematology and Oncology medical staff, senior nursing and facilities management, infection control and the general manager for paediatric services. An MDT group was established to provide oversight of this data.

	Recommendation 7 ICNet alerts	This is already in place and is a standing agenda item on the BICC reviewing updates to the NIPCM.
3223	Recommendation 8. Infection incident and outbreak policy	RCA usage is recommended although the report earlier notes that these have been in place since October 2019 so may be an unnecessary recommendation.
3263	Recommendation 11 Patient records NHS GGC should clarify their strategy for further evolution towards fully digital records	Before such a recommendation is made in the report, the national context may be useful, with GGC extremely well placed in this respect. The approach outlined below is in line with NHS Scotland Strategy and delivered via the NHS Scotland national Patient Management System contract. In the interim clinical portal and Trak care provide the integrated view of structured data held within specialty systems alongside scanned paper records. GGC has made significant progress in recent years to make available clinical information regardless of physical location to support clinicians within the Board or region as recognised in the NHS Scotland 2019 national Digital Maturity Assessment. The case note review has flagged that while systems support individual care pathways, the ability to review and manipulate datasets at scale from systems does require additional focus and the Board would look to adopt the recommendations of the case note. This may help to share learning across NHS Scotland Boards as the majority of systems reviewed are standard across NHS Scotland (Trakcare , Portal , LIMS and ICNET) 5 other NHS Boards currently use the Telepath Laboratory Information System (GGC, Forth Valley, Dumfries & Galloway, Lothian and Grampian) and we are currently in the midst of a national procurement to replace this legacy platform and award an NHS Scotland wide contract in January 2022 subject to FBC sign off. OBC has been approved by GG&C and the other Boards. *Systems* o Electronic Health Records - TrakCare o Majority of ED, in-patient and out-patient documentation is currently handwritten and scanned into Clinical Portal. Active Clinical Notes (ACN) in TrakCare will enable the Board to incrementally move from paper to electronic. o Business Continuity and Legal Record functionality in TrakCare T2020 will enable to the Board to fully

		implement Active Clinical Notes and deliver a complete electronic health record. o Development has started on ACN in ED and the Nursing My Admission Record however there is a dependency on Business Continuity and Legal Record functionality in TrakCare T2020 to allow us to deploy to LIVE and implement across the Board. o Requires system upgrade to T2020 - Timescales for implementation – June 2021 o Digitisation of ACN - ED – August 2021; Inpatient (including My Admission Record) – September – December 2021; Outpatient - September – December 2021 .
3270		It should be reflected that the Paediatric Haematology and Oncology service has a long standing robust methodology for the reporting and analysis of adverse events through the governance group. The group produces a report at the end of the meeting that discusses outcomes and learning points. These are disseminated across the whole clinical team and are put in the departmental newsletter. Again this is available however there was opportunity for discussion at the regular clinician meetings had it been known the review report would be commenting on the wider service.
3298	Recommendation 15 15. Other aspects of Clinical Care	Antibiotic prophylaxis / line prophylaxis is already being audited.

Appendices.

- Public Health Commentary
- Full data and systems analysis
- IMT Summary
- Ward Safety data

Appendix 2

Case Note Review Data & Systems Clarification

Access to Clinical Information & System Access Timeline

There are a number of comments around availability of data throughout the report – which to the reader may appear that GG&C were being intentionally obstructive around providing data and access to systems. Clearly this was not the Boards intention.

The process and timescales for the original ISA were as follows:

14/02/20	Caldicott Guardian and Director of Public Health ,Linda de Caestecker sought advice from DPO on DP/IG requirements re case note review.
17/02/20	Emilia Crichton, Deputy Director of Public Health asked the Board Data Protection Officer to put an Information Sharing Agreement in place
19/02/20	Draft ISA completed but further details were required from others to conclude the agreement
20/02/20	Meeting with Information Governance Team (Jackie Henderson), Professor Bain and others to discuss ISA and finalise information required. During the wc 24th Feb the Board Information Governance team discussed outstanding requirements and kept in touch with Profession Bain via email on 27/02 with regard to a key meeting planned on 03/03 with the Board Head of Information Service, Jonathan Todd and Dr Patricia O'Connor and Shona Cairns who were progressing things on behalf of Profession Bain. The purpose of this meeting was to discuss the clinical information required for review and to seek clarifications required to complete the Information Sharing Agreement.
04/03/20	Emilia Crichton, Deputy Director of Public Health, queried why so many people required access and asked if they could be given pseudo anonymised data. J Todd explained why this was not possible.
05/03/20	Emilia Crichton requested further detail on methodology on appendix in ISA which Jonathan Todd followed up on.
06/03/20	**Information Sharing Agreement was signed off by Emilia Crichton** There were subsequent requests for changes and additions the majority of which were dealt with quickly. However, there were areas that took a little longer - the detailed timeline is set out in a separate tab. The Boards Deputy Director of Public Health, Emilia Crichton was initially concerned about the amount of people being given access and therefore she requested that all of the requests and changes were approved through her and not delegated to the Board Data Protection Officer. There has been learning from this exercise in that changes were not anticipated and with hindsight, to avoid unnecessary delays, a change process should have been considered and approved and this will be done for any future complex projects or enquiries.
02/3/20	Email from Dr Patricia O'Connor to Jonathan Todd – Head of Information Management Hi Jonathan,

Thank you for your time and support this morning. We have made tremendous progress on sorting out the processes we will need to access the records required for the case note review.

Shona will forward the HPS protocol under separate cover along with the additional individuals required for the GG&C accounts from an epidemiological perspective .

From the PPT perspective the individuals requiring access to the clinical records and portal are:

Paediatric Nurse: Mr. Peter Campbell, Associate Director of Nursing, NHS Lothian. Peter.Campbell[redacted]

Paediatrician: Dr Linda Clerihew, Consultant Paediatrician, NHS Tayside, linda.clerihew[redacted]

Haemato-Oncologist: Professor Hamish Wallace Hamish (NHS LOTHIAN) hamish.wallace[redacted]

Infectious Diseases Consultant: Professor Peter Davey p.g.davey[redacted]

ICP Nurse: Lesley Shepherd :Lesley.Shepherd[redacted]

Paediatric Pharmacist: Dr Jacqueline Sneddon, Project Lead for Scottish Antimicrobial Prescribing Group, Healthcare Improvement Scotland, jacqueline.sneddon[redacted]

Review Co-ordinator: Dr Patricia O'Connor I already have access(including remote) I just need the permissions levels to access the clinical portal and trackcare

patricia.o'connor[redacted]

Let me know if there are any other details you need. I look forward to next steps to test out access and use of the tools next week.

Kind Regards

Pat

Dr Pat O'Connor RN, RM, BSc, MBA, PhD

Honorary Professor

University of Stirling

Faculty of Healthcare Sciences and Sport

Executive Director

QI Discovery

M:[redacted]

email: oconnor[redacted]

skype:[redacted]

02/3/20 The Boards eHealth Directorate received the names of those involved in the review and a request to set up accounts submitted on 3/3/20. Clarifications received from user provisioning team on 4/3/20 re level of access required. Confirmation of accounts set up was issued on 5/3/20.

02/7/20 Accounts were originally set up to expire on 30th June 2020 when it was anticipated the review would be completed. A request was received on 2/7/20 to extend access as work was ongoing. Access to accounts was extended on the same day (2/7/20)

It was however noted that on the 25/8/20 the review team and Board agreed to add additional system access request to the Information sharing Agreement. This would imply that at this stage there was a recognition that a deep dive into the laboratory system was required – as opposed to the clinical information contained within the case notes.

- Telepath (Board Laboratory system)
- eViz (is a system for files shared through secure project within eViz Tableau, a server operated by NSS BI to support secondary use of data manipulation in order to carry out retrospective review)

Access to both was approved by Emilia Crichton , Deputy Public Health Director on 1st September. Training and completion of access forms required for review team.

- Hayley Kane (Infection Control Manager, NSS)
- Professor Michael Stevens (Expert Panel)
- Professor Mark Wilcox (Expert Panel)
- Gaynor Evans (Expert Panel)

01.10.20 Marie Brown asked Wilma Kilroy to extend access for 4 team members until 31.03.21.

01.10.20 J Todd confirmed to W Kilroy that this access was required

01.10.20 W Kilroy confirmed to J Todd she would arrange this once she received the login names with M Brown and others cc'd in

However, nobody confirmed the login names to W Kilroy and due to other workload this was overlooked but was not followed up by the requester, therefore the accounts were never extended

Page 63 – Section 8.1.1 - 2087
Re the delay in getting access for an additional member of staff the following details can confirm the situation:

23.10.20 Marie Brown emailed IB requesting 1 new person to be added to ISA

04.11.20 Marie Brown emailed IB requesting an update

09.11.20 Marie Brown emailed IB requesting an update

09.11.20 E Vanhagan emailed IB asking for an update on the request

09.11.20 IB emailed EVH and M Brown confirming approval and apologising for delay

The Board DPO was on sudden bereavement leave from 19.10 - 08.11 and access was approved the day she returned on the 9th Nov. However given there is a wider governance infrastructure and she has deputies who were known to the review team and an escalation within the eHealth Directorate / Caldicott Guardian route exists this feels like a breakdown in communications from both the review team and the Board and to highlight in the review feels uncomfortable on both parties.

Laboratory Specific datasets

Page 15 -449 of the report outlines concerns around data availability. The Timeline below outlines timescales for providing access to data and systems

19/08/20

Elaine McCormick, Laboratory Information Systems Manager, first engagement with Marie Brown, regarding Telepath patient notepad information.

Specific patient details were provided on a weekly basis & the Telepath Patient Notepad information for the dates specified were provided back to Marie Brown as required. As described in the report the telepath notes is an internal laboratory annotation that microbiologist utilise to share information amongst this professional group to outline what they have communicated to medical staff within wards or across the organisation. PMP is an internal communication tool to enable notes to be visible to other colleagues involved in case. This is not incorporated into the Boards portal care record as the clinical information is the detail of test carried out as opposed to a “notepad”

This continued through August – October as required with no significant concerns being raised to the GG&C team by the review team.

21/08/20

Elaine McCormick, provided information regarding the display of results for specific patients in ICNet to Marie Brown.

22/09/20

Data sharing agreement passed onto Elaine McCormick via Marie Brown, with regard to Telepath access for case note review staff:-

- Peter Davey
- Fiona Murdoch
- Hayley Kane

Telepath Access Request forms were passed back to Marie Brown for completion by staff requesting access. – Access Request forms received back on 24.9.21

Telepath training was organised on the 30.9.20 via Teams

Only Peter Davey attended. Telepath login was provided & training took place which included how to access the patient notepad.

9/10/20

Telepath logins were provided for Fiona Murdoch & Hayley Kane.

Provided training documentation for Fiona Murdoch but login has never been used.

Hayley Kane was familiar with Telepath, as she had used the system previously in her role as an ICN

12/10/20

Email from Peter Davey to Elaine McCormick (with Marie Brown copied in) stating that it would be best to get labs to download the full patient notes for each of the case note review patients CHIs provided, and agreement that Elaine would be able to provide the information

Full case note review labs Information:-

Sandra Higgins, the Microbiology Service Manager & Elaine McCormick worked on data provided by DMA (3rd party) & Telepath extracts to identify every water sample taken during 2016 – 2020.

An extensive piece of work was carried out, to marry up the Telepath data & DMA (third party data), to identify what location each water sample had been obtained from 2016 onwards where telepath data was combined with data from DMA (Third Party Supplier responsible for Water Sampling). The reason for the delay was that all Telepath records prior to 2017 were manual and not electronic therefore there was a lengthy and manual process to review all paper records and marry up with samples and add to the requested consolidated data set.

This was provided to Alastair Leonard on completion for submission to the review.

Page 64 – Section 8.1.2 around 2101

File Description	**Final Submission Dates**
2015 Potable Water Samples	13/11/2020
2016 Potable Water Samples	13/11/2020
2017 Potable Water Samples	13/11/2020
2018 Potable Water Samples	13/11/2020
2019 Potable Water Samples	13/11/2020

For Potable Water samples this involved merging LIMS (Microbiology Telepath Records) & DMA external company records. We also reviewed these once completed alongside the paper records to

ensure there were no omissions or inaccuracies due to merging different data sets. In addition to this pre April 2017 the laboratory was working on a paper based system and only introduced the LIMs system therefore all records up to that date had to be transcribed from paper records.

File Description	Final Submission Dates
2015- Nov 2020 Environmental Surfaces	13/11/2020

File Description	Final Submission Dates
2015 Reference Lab File	16/12/2020
2016 Reference Lab File	16/12/2020
2017 Reference Lab File	21/12/2020
2018 Reference Lab File	10/12/2020
2019 Reference Lab File	11/12/2020

The reference laboratory files involved extracting samples from the LIMS that had isolates referred to PHE for typing. To ensure nothing was missed GG&C requested from PHE all Gram Negative Isolates that had been referred to them from the QEUH. This formed the master files that GG&C then had to request admin staff to transcribe the complex reference laboratory results. This was a long process due to the amount of information and as we stated is not something that GG&C staff routinely do.

However the case note review report implies that (page 15 449 – Communication and engagement with NHS GGC, requesting critical data for panel consideration, began 8.4.20 and continued until a final set of data was received on 21.12.20) but doesn't clearly articulate the work required to map a vast dataset of a 3rd party to that data which the Board was able to generate and provide.

Again under 3.1.1 the report outlines (line 464) that data extraction had been successfully established, but (line 470) the extent of the lack of data to support the review was becoming apparent. All these points do not actually reference the work GGC was undertaking to marry up external and internal data sources for extraction however the report is written to imply multiple requests were not fulfilled – with no recognition for the size and scale of the task - despite the time taken for DMA to submit data as they had also had their own manual process in place and it took a few meetings led by GG&C in order to get the data in the required format.

Reference Laboratory Reports:-

Reports for isolates sent to external Reference Laboratories, for both patient & environmental samples were stored locally

Any reports associated with a patient, were scanned locally onto Dart (an internal laboratory system which associated a record with the original Telepath laboratory number and scanned into the Board electronic record so viewable by all.

This allows scanned documents to be viewed in tandem with the Telepath result

Reference Laboratory results are not transcribed into Telepath for governance of results and the risk of transcription error, adding an external result to our own lab report could be misinterpreted as our result and not that of the external laboratory (it also could be different)

. A report is issued saying the report is available on Portal & the original Reference laboratory result will have been scanned to Portal against the patient record. This is in keeping with UKAS guidelines and practice in other NHS Boards.

Patient Record Systems

Page 95 - Section 11 – 3263

- Clarify strategy for further evolution of digital records –
    - Electronic Health Records - TrakCare
    - Majority of ED, in-patient and out-patient documentation is currently handwritten and scanned into Clinical Portal. Active Clinical Notes (ACN) in TrakCare will enable the Board to incrementally move from paper to electronic.
    - Business Continuity and Legal Record functionality in TrakCare T2020 will enable to the Board to fully implement Active Clinical Notes and deliver a complete electronic health record.
    - Development has started on ACN in ED and the Nursing My Admission Record however there is a dependency on Business Continuity and Legal Record functionality in TrakCare T2020 to allow us to deploy to LIVE and implement across the Board.
    - Requires system upgrade to T2020 - Timescales for implementation – June 2021
    - Digitisation of ACN - ED – August 2021; Inpatient (including My Admission Record) – September – December 2021; Outpatient - September – December 2021

This approach is in line with NHS Scotland Strategy and delivered via the NHS Scotland national Patient Management System contract. In the interim clinical portal and trakcare provide the integrated view of structured data held within specialty systems alongside scanned paper records. GG&C has made significant progress in recent years to make avliable clinical information regardless of physical location to support clinicians within the Board or region as recognised in the NHS Scotland 2019 national Digital Maturity Assessment. The case note review has flagged that while systems support individual care pathways, the ability to review and manipulate datasets at scale from systems does require additional focus and the Board would look to adopt the recommendations of the case note review . This may help to share learning across NHS Scotland Boards as the majority of systems reviewed are standard across NHS Scotland (Trakcare , Portal , LIMS and ICNET)

5 other NHS Boards currently use the Telepath Laboratory Information System (GGC, Forth Valley, Dumfries & Galloway, Lothian and Grampian) and we are currently in the midst of a national procurement to replace this legacy platform and award an NHS Scotland wide contract in January 2022 subject to FBC sign off. OBC has been approved by GG&C and the other Boards.

Page 77 - 2620

- Generic continuation - No documentation is filed under Generic Continuation. Notes that that typed directly into Clinical Portal are either - IP Consultation, OP Consultation, Remote Consultation or MDT. These notes are filed under speciality in clinical portal. Notes that are scanned into Clinical Portal are filed by IP Medical Note, Nursing Assessment, AHP Assessment,

Anaesthetic Record, OP Note, Drug Administration Chart, Consent. These are filed under the discharge speciality. There is a Generic Continuation Sheet as an eForm - this is historic and is no longer used but still visible.

- Clinical Portal indexing

Divider Tab	Clinical Portal Indexing			
	Folder	Sub folder	Service	Date
Medico Legal	Notification and legal documents	Legal notice	Acute specialties GGC	Document
Anaesthetic notes	Intervention records	Anaesthetic record	Anaesthetic	Discharge
Medical notes	Clinical notes	Inpatient medical note	Specialty at time of discharge	Discharge
Consent Form	Notification and legal documents	Consent form	Specialty at time of discharge	Discharge
Operation notes	Intervention records	Operation note	Specialty at time of discharge	Discharge
Nursing notes	Assessments	Nursing assessment	Specialty at time of discharge	Discharge
AHP notes	Assessments	AHP assessment	Specialty at time of discharge	Discharge
Medicines and Prescribing	Medication	Drug administration chart	Specialty at time of discharge	Discharge

Page 78 - 2682

Process for bed closures – there is Board wide guidance which can be made available. Bed closures are also reflected in Microstrategy dashboards. If processes were not followed this will be reviewed

Page 77 - 2620

NHSGGC operates a distributed scanning model for OP and IP / DC attendances / admissions which was implemented in a phased way from 2013 onwards. This process means that the patient's paper health record was locked down and all attendances from the implementation date forward are scanned into Clinical Portal.

For inpatients each patient has a scanning folder created when they attend hospital which stays with them throughout their admission. The folder is divided into different indexing sections which ward staff will then file documentation appropriately within. The Filing within the scanning folder will then determine the filing within the clinical portal system when the record is scanned.

For the majority of inpatients, the folder will be scanned in totality on discharge for the whole episode of care. Our SOP determines that records should be scanned by discharge date to allow ease of reference. A QA process is in place to audit compliance within the scanning hubs.

For long stay inpatients incremental scanning is used whereby at regular intervals records will be scanned to clinical portal rather than waiting on the patient being discharged. Some patients can be in our wards for over 1 year and therefore managing in a paper-based system on a ward for that length of time would be unmanageable, In addition it would mean where a patient is transferred to another area of the hospital for example ED for an accident or injury the patients notes would not be available electronically. The incremental scanning process will mean patient episodes will be scanned in phases and therefore not under discharge date.

The scanning team will visit all wards twice per day to collect scanning folders of discharged patients and return these to the centralised scanning hub on site for preparation and scanning within 24 hours of pick up. Documentation is scanned under discharge date and then goes through a QA process. Thereafter paper copies are retained for 6 months and then destroyed.

There can be occasions when records are returned and scanned but later turn out to be incomplete. In this scenario given the episode has been scanned already, the medical secretarial staff would be responsible for scanning the loose documentation relating to the episode of care, the guidance in this scenario is that this documentation should be scanned under episode date of discharge , however this would appear as a second episode for the same discharge date. It is possible that in this scenario some staff have scanned this information under date scanned rather than discharge date which could in turn lead to notes appearing many months after discharge.

There is a Board wide QRG for scanning and also the Incremental scanning process documents. Clearly the Board would like details of individual case records to address where this was identified.

Appendix 3

IMT summary

Summary of Factual inaccuracies and misleading information in 8.1 Areas of concern: IMT and outbreak investigation

Line 2190: Recognising and investigating an outbreak: the NHS GGC SOP

Line 2205: We acknowledge that the SOP states that the incident should be reported on Datix. However, Datix is really a tool for the investigation of individual cases. It is not common practice in other Health Boards to Datix outbreaks.

Line 2225: Compliance with the process

Line 2233-2234: The incidents were investigated in line with national guidance available to GGC and all incidents were reported to HPS in line with guidance. The progression of an incident from the PAG to the IMT was at the discretion of the LICD using the available data at the time.

Line 2242: the Term HAI is a national term

Line 2251-2256 (SPC charts)

This is misleading and does not reference that GGC followed national process, that the expert (HPS In Scotland) recommend SPC charts, and that GGC utilised other methods to plot cases which would enable the identification of possible clusters for example timelines.

Part of the learning from these incidents and indeed reservations from the clinicians (Set out below) led to a new methodology recommended by HPS and is now being piloted by GGC with evaluation by HPS.

Full evidence is set out below:

1. The SPC is a method which is advised by HPS and Scottish Government approved: HPS and the HAI/AMR Scottish Government policy team were closely involved throughout both 2018 and 2019 with HPS a member of the IMT (and indeed in the lead from 26th March 2018 for the outbreak) and the Scottish Government team providing advice and oversight as well as intermittently joining the IMT.
2. The epidemic curve plots the cases in time and allow identification of possible clusters. Please find below an example of this work which was discussed at the IMT, and with the clinicians, and subsequently with HPS and the Scottish Government in 2019.

20190921 Haemato oncology data AND

3. In the IMTs there was debate around the SPC methodology among HPS, the Consultant in Public Health Medicine, clinicians and microbiologists and this is reflected in comments included in the Proforma response.
4. In October 2019 a retrospective RCA was done by the Consultant Nurse in Infection Control along with clinicians from the unit. From November 2019, all cases now subject to that approach.
5. The HPS (Nov 2019) report set out the use of SPC charts and a summary of the approach and its uses are set out below:
    - *Reviewing monthly SPC charts has been shown to be an appropriate method in identifying triggers and outliers when a stable period can be used to set the mean. In this review, the crude incidence rates before and after the move did not reflect the variation in incidence over time within this population. The changes in activity, in particular the occupied bed days, have highlighted the importance of considering activity when interpreting charts and where possible to use incidence rates in SPC charts. The use of grouped case definitions have allowed the data to be reviewed without reporting bias of selecting significant organisms or over reporting when multiple organisms are isolated from the one patient.*

6. The IMT minutes of 14/11/19 show the controls agreed as part of re-opening the ward; this was then directly approved by the CNO and indeed the Cabinet Secretary thereafter.

17. IMT Ward 6A
Gram Negative Bloo

7. There is now an agreed new approach in place which has been advised by HPS and is undergoing evaluation by GGC/HPS for potential use in other areas.

Paediatric
haemato-oncology a

Examples 8.2

Lines 2259-2270 This is factually inaccurate and misleading in the following respects

- It is not clear that Klebsiella rates were higher than expected as this is the second commonest cause of bacterial infections and we note 'apparent' is used when describing clusters;
- It is not included in the NIPCM alert system for NHS Scotland but GGC added to its alert system in 2018.
- The cases **were** included in the 2018 water incident master copy of patients and discussed.
- There is no discussion about the relative endogenous nature of this organism and relative environmental exogenous nature.
- Water sampling has rarely identified this organism.
- Lines 2276-2295: This is a retrospective judgement which does not provide context nor detail of how cases were highlighted and indeed the HPS report of 2019 which reviewed this in detail, GGC followed national process, engaged the expertise of HPS and SG HAI policy unit throughout this period and is now engaged in piloting a new approach with HPS.
- Line 2299 – 2300: The report which GGC sent to HPS in October and updated in November sets out a full review of the actions from 2018 onwards (see section 11)

211119 NHSGGC
QEUH Ward 6A Actic

Lines 2306-2325 – Example 8.3

This is a misleading example as it suggests GGC acted outwith national policy and was not following advice. GGC **did** report all cases, **did** use run charts and **did** investigate them. The CNO had invoked the national framework tool on 26th March 2018 giving HPS a leadership role. HPS and the Scottish Government were closely involved and received and advised on reports. It would be helpful to put this into context:

- In 2021, Enterobacter was not listed as an alert organism in the NIPCM; it was added to the GGC alert list in 2018
- Surveillance was used at the time with run charts which is consistent with national methodology
- The HIIAT Score was **not** queried by HPS and seems to us that this is a retrospective judgement
- 3 of the 5 cases not considered HAI – this was consistent with national methodology with unique typing of 2 cases
- **All** cases were added to the master list at the time of all cases to HPS for the water incident.

Line 2343: Example 8.4

- There was full advice and support from HPS who are required to ensure that the HAI/AMR Policy Unit are kept fully appraised with all developments; an example of one of these reports is given below.


2018-04-13 email.doc


HIIORT 2A Water supply 130418.doc

- The IMT was stepped down with full involvement with HPS and SG HAI policy unit: the detailed reasons are provided in the minute with clear triggers established and agreed and set out below;

- The SG HAI policy unit had requested directly all information by COP 25th of June for review. In addition, they were briefed directly by HPS after each IMT. They did not query the information nor the decision to step down the IMT.
- The 2 cases referred which are referenced were not HAI cases and indeed one came from another board.

- Lines 2349-2369 – **Adequacy of IMT meeting records**
- Many of the issues set out in this section highlight the areas which the revised outbreak policy and SOP seek to address: there was a review by the board following concerns highlighted by members of the IMT in September 2019 of inappropriate behaviour and lack of structure to the IMT.


IMT Discussion note - Tues 20 Augu

- The revised outbreak policy and the revised SOP seeks to provide more robust measures to address this.
- A full response and collation of timelines was sent to HPS in late 2019 of the whole incident in 2018 and 2019.

Line 2365 Please note that an example has been given in the Proforma of a detailed case timeline tracked across a number of IMT meetings

8.2.2.4 Upward reporting from IMT meetings

Lines 2396 – 2415

This is factually incorrect and we would request that this is reviewed.


CasenoteHAIRTFI (002).doc

Methodology SPCs and RCA

HPS published the Review of NHSGG&C paediatric haemato- oncology data report in October 2019.

The organisms included in the report were added to individual reports on ICNet which would capture any individual, designated on TrakCare as under the care of a paediatric haemato-oncologist, with the specified organism isolated in a blood culture specimen. These reports were designed by the IPC Data Team and Lead Surveillance Nurse. The same methodology for data analysis and interpretation as contained in the published report was followed.

These organisms also created a case (alert organism) on ICNet for the IPCT to investigate, enter & complete enhanced surveillance data.

HPS provided the formulated Excel spreadsheets with SPC occupied bed day (OBD) rate data for Gram negative, environmental group and environmental including enteric group organisms that were included in the report. This ensured that the same data set would be used as a consistent baseline for ongoing surveillance of these organisms.

Occupied bed day data is published locally on StaffNet by NHSGGC Business Intelligence (part of eHealth). This is usually in the middle of the next month following completion of the calendar month.

The bed occupancy number for each month is then entered into each worksheet and the number of patient cases is also entered. This then provides the rate per 1,000 total occupied bed days. The SPC chart is then populated.

If prospective status data is required before the validated OBD data is published, then an average of the three previous months data is used. This is highlighted on the SPC chart and report.

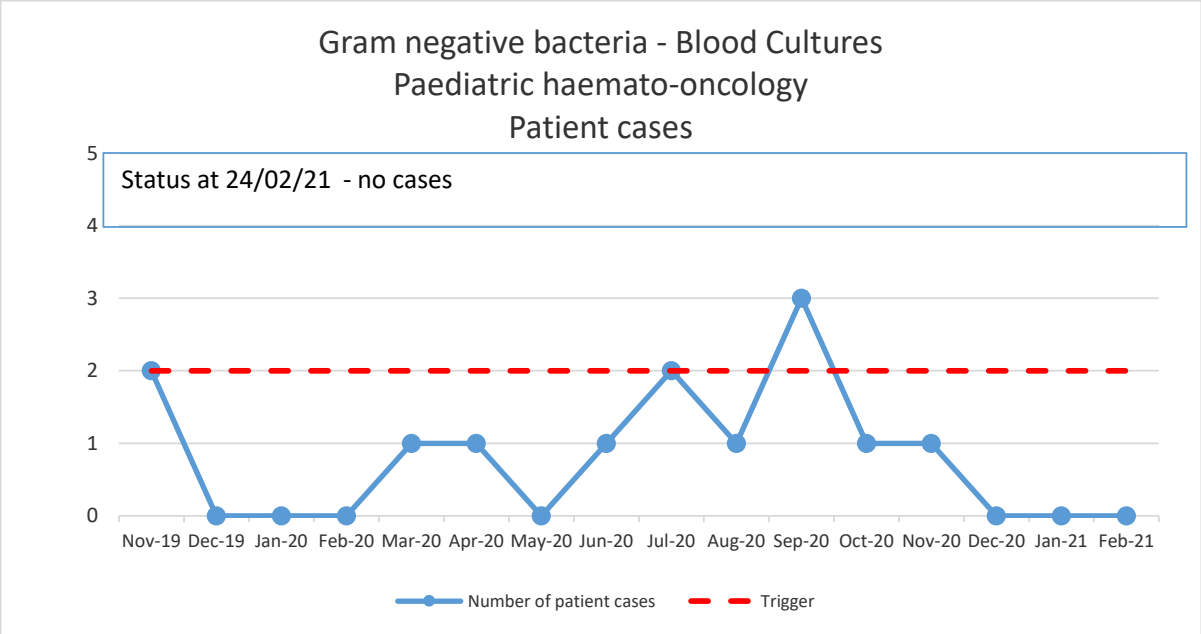
Local patient case number line graphs were also commenced in November 2019. These display the total number of patient cases each month.

The SPC charts do not further qualify whether the blood culture is hospital acquired i.e. hospital in-patient >48 hours, however due to this patient group these should be considered to be healthcare associated infections.

This information below is underpinned by RCAs which are carried out on any patients who has a positive BC and regardless if the infection is thought to be either Healthcare Associated or Hospital Acquired. A copy of this proforma is embedded here:

RCA document for Haem Onc.docx

The results from ongoing surveillance is below. It should be noted that this is the same environment with the same controls in place since the ward moved back into 6a at the beginning of 2019.



There were three cases in September and one in November. The cases in September:, one was associated with another hospital (HCA other) and one had been in OPD in RHC for treatment (HCA RHC) and one was community acquired. There have been no cases since November 2020. The patient in November was hospital acquired however all water and environmental sampling in the previous two years was negative for the organism identified.

CLASBI

The CVL QI Project Steering Group was formed in May 2017 following an upsurge in central line infections in the unit. The Group was formed to draw together frontline members of staff working on 2A, with other key stakeholders, including surgeons, anaesthetists, intensivists, radiologists, oncologists and local experts in QI methodology, to work collaboratively and share expertise. The primary aim of the project is to reduce the central line associated blood stream infection (CLABSI) rate in ward 2A and 2B to 1 per 1000 *total* line days. This is benchmarked against Cincinnati Children's Hospital in Ohio.

The QI group refer to CLABSI as defined according to the CDC classification as:

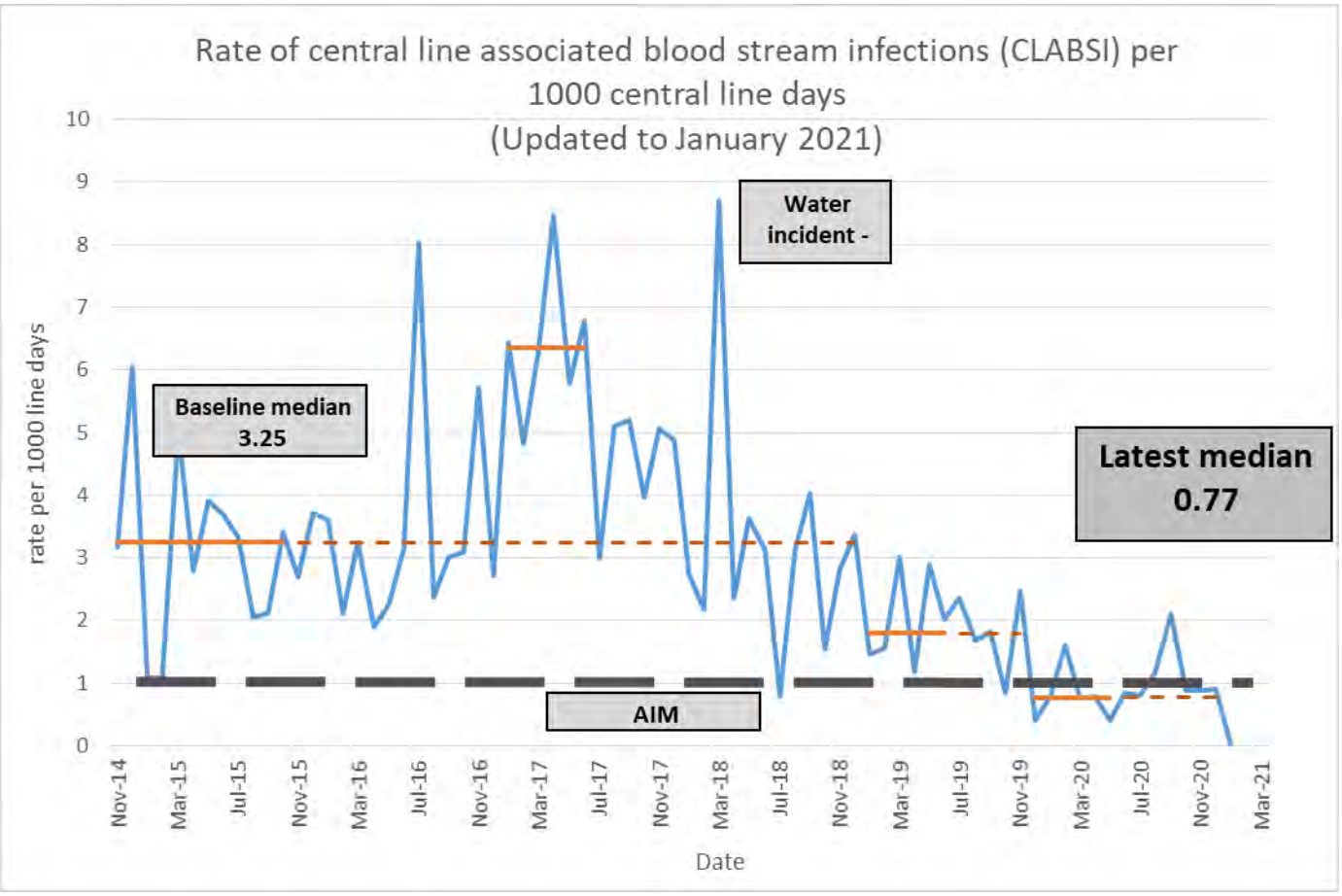
'A CLABSI is a primary BSI in a patient that had a central line within the 48-hour period before the development of the BSI and is not bloodstream related to an infection at another site. However, since some BSIs are secondary to other sources other than the central line (e.g., pancreatitis, mucositis) that may not be easily recognized, the CLABSI surveillance definition may overestimate the true incidence of CRBSI'

The Group undertook four main work streams for improvement:

- Line Insertion and access in theatre
- Access and Maintenance
- Staff Education
- Patient and Parent engagement

Results:

- An issue identified and acted on using QI methodology locally led with support and reporting through board structures and MCQIC
- CLABSI rate reduced and stabilised (note astronomical data point)
- Significant and sustained reduction in CLABSI rate in the haemato oncology population, currently less than 1 per 1000 line days.



The CLABSI Data Collection Process is as follows:

1) ALL patients receiving a new central venous device at Yorkhill/Glasgow Royal Hospital for Children from January 2015 to date (using Opera data to look at every operation done in every theatre every day in the Children's Hospital)

2) Out of this group, only the haematology/oncology patients were kept (searching for and confirming a diagnosis via Clinical Portal)

3) The total line day data was obtained by counting the number of days each line was in situ

4) Each patient was analysed monthly or twice monthly looking at positive microbiology culture results from either a central line or a peripheral venous sample whilst a central line was in situ (via Clinical Portal)

5) Any positive microbiology result with a concurrent illness (IE chest infection or urinary tract infection) was excluded (again via Clinical Portal and the electronic notes)

6) If a culture positive result occurred repeatedly in the 7 days following the first positive culture and the organism was the same, this was excluded (IE a patient with a Staph Aureus infection on 5/9/18 and a subsequent culture positive Staph Aureus on 7/9/18 was only counted as ONE infection); a second Staph Aureus infection on 13/9/18 would becounted as TWO infections in total as one would presume that a week of treatment should
have effectively treated the first organism.

7) If, however, a second culture positive result occurred in the 7 days following the first positive culture and the organism was different, this was included (IE a patient with a Staph Aureus infection on 5/9/18 and a subsequent culture positive pseudomonas infection on 7/9/18 was counted as TWO infections in total).
8) Patients receiving their Hickman/Broviac Line, Port, or Haemodialysis line in a unit other than the Royal Hospital for Children in Glasgow were excluded. This point was discussed at the first CLABSI QI meeting and it was felt that these (few) patients that had line inserted elsewhere but were treated in Glasgow could not be analyzed in the same fashion as those receiving the majority of their care (from line insertion to treatment to line
removal) in Glasgow.
9) Patients shared care in local district general hospitals who presented locally initially with a CLABSI and were subsequently transferred to Glasgow did not have that single line infection counted for similar reasons (we would be looking at the management of care in the district general hospital and thus would not be able to analyze them in the same methodology). To produce the total CLABSI/Gram negative CLABSI chart as shown in the presentation,
each line was checked to assign he organism to either gram positive, gram negative or
fungus. The same denominator (line days) was used. Where there were multiple organisms in a single line, the first named organism was used for classification. One organism was not classified, as it can exist as gram positive, gram
negative or gram neutral.

Appendix 1

Public Health Commentary

The Case Note Review acknowledges the known hazard of blood stream infections in Paediatric Haematology Oncology patients and included a summary of the published evidence of increased morbidity and mortality, with a quoted study saying that 45% of patients required at least one admission due to sepsis concerns.

The Review carried out an extensive data collection and descriptive epidemiology analysis of the NHSGGC patient's cohort to elicit any factors within the case mix that could have a bearing on the clinical outcomes, and establish a causal link for the infections within the environment.

Given the known and well published risk of infections among this group of patients, it would be useful to overcome the limitations of descriptive epidemiology (time, place, person) showing crude numbers of patients, by pathogens along timeline, through additional epidemiological analysis.

Useful additional analysis would be: calculating incidence of infections of interest in the population at risk and establishing the trend of the infection incidence in time; Comparison of incident rates to other comparative Units within Scotland /UK or published data; standardisation of infection rates to account for known confounders like age, sex, ethnicity, deprivation; calculate expected rates of infection within the cohort based on published data.

NHSGGC commissioned HPS to carry out data analysis that included statistical comparisons of infection rates within the NHSGGC Unit to the combined Aberdeen and Edinburgh Units and we believe the findings of the analysis should be included in the Case review.

When establishing the number of patients at risk due to environment, the causality test assessed using the Bradford-Hill criteria (J Roy Soc Med 1965:58:295-300) would be more appropriate as any observed association may in fact be due to the effects of one or more of the following: chance (random error) ; bias (systematic error) ; or confounding.

Indeed, the Case Review acknowledges the difficulty in assessing links to the environment as the cause of infections. We believe that the use of statistical methods (like indirect standardisation) would be more suitable to assess the chance of a real excess number or cluster to avoid the cognitive bias of "Clustering Illusion". The control measures instituted on the basis of the precautionary principle should not be used as evidence of causality.

The assessment of pathogen transmission and identification of sources in outbreaks has benefited vastly from the introduction of whole genome sequencing that provides the most robust microbiological evidence. Public Health England introduced WGS in 2014 in foodborne outbreak investigation and Glasgow University has developed the technique locally to help manage outbreaks. WGS analysis carried out in September 2019 allowed the IMT to understand the degree of relatedness among cases and, together with the Root Cause Analysis findings make final recommendations for the incident. We would like to see the findings of the WGS carried out for the common pathogens included in the Case Review as robust microbiological evidence that helps map the causality relationships among the infections seen and also avoids publication bias.

Commented [MS1]: The points made in this appendix are similar to or supplement points made in the main proforma document and are responded to there

Commented [mw2]: We do not believe these analyses would change our conclusions. The case mix of paediatric oncology patients in GGC would likely not be possible to match well with other such units in Scotland.

Commented [mw3]: Not clear what 2019 WGS they are referring to. The fact that they did not carry out (?all/the bulk of) the WGS until 2020 implies (and that had major limitations) is already noted in our report.

Dr Emilia Crighton, 25/02/2021

Response to comments in Appendix 2

Page	Comment	Response
5	12/10/20 Email from Peter Davey to Elaine McCormick (with Marie Brown copied in) stating that it would be best to get labs to download the full patient notes for each of the case note review patients CHIs provided, and agreement that Elaine would be able to provide the information	This information was never received. Downloaded information about 12 cases had been provided previously. Information about the remaining 72 cases required manual typing of data from Patient Note Pad on the GGC computer into narrative notes for the Expert Panel.
8	**Page 77 - 2620** - Generic continuation - No documentation is filed under Generic Continuation. Notes that that typed directly into Clinical Portal are either - IP Consultation, OP Consultation, Remote Consultation or MDT. These notes are filed under speciality in clinical portal. Notes that are scanned into Clinical Portal are filed by IP Medical Note, Nursing Assessment, AHP Assessment, Anaesthetic Record, OP Note, Drug Administration Chart, Consent. These are filed under the discharge speciality. There is a Generic Continuation Sheet as an eForm - <u>this is historic and is no longer used but still visible.</u>	The text on digital notes is in lines 2644-2658 of the Case Note Review Overview. We described notes as Digital if they could be searched digitally within Clinical Portal. We had no way of knowing whether they were typed directly into Clinical Portal or imported from another source so we have amended the Overview Report to say "*Digital inpatient medical records"* instead of *"Digitally typed inpatient medical records".* We are unsure what is meant by an "eForm" so it is possible that these accounted for some of the digital notes that we identified. We found some documentation filed under Generic Continuation in all the patients that we reviewed. These documents were filed under specialty and if this was Paediatrics the Generic Continuation document usually contained inpatient medical notes. All of the digital notes that we found were filed by the date of the last entry. When these contained inpatient notes they were usually from more than one admission. The longest spanned 35 months, from 11 Jan 2016 to 4 Dec 2018.
8-9	**Page 77 - 2620** For the majority of inpatients, the folder will be scanned in totality on discharge for the whole episode of care. Our SOP determines that records should be scanned by discharge date to allow ease of	We found Inpatient Medical Notes filed by date of discharge in 59 (50%) of 117 episodes. However, 13 of these were incomplete. Complete scanned IMN filed by date of discharge were only found in a minority (46, 39%) of episodes.

Commented [PD(1]: This is the only change that we are suggesting for the Overview Report

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	reference. A QA process is in place to audit compliance within the scanning hubs. For long stay inpatients incremental scanning is used whereby at regular intervals records will be scanned to clinical portal rather than waiting on the patient being discharged. Some patients can be in our wards for over 1 year and therefore managing in a paper-based system on a ward for that length of time would be unmanageable, In addition it would mean where a patient is transferred to another area of the hospital for example ED for an accident or injury the patients notes would not be available electronically. The incremental scanning process will mean patient episodes will be scanned in phases and therefore not under discharge date. The scanning team will visit all wards twice per day to collect scanning folders of discharged patients and return these to the centralised scanning hub on site for preparation and scanning within 24 hours of pick up. Documentation is scanned under discharge date and then goes through a QA process. Thereafter paper copies are retained for 6 months and then destroyed. There can be occasions when records are returned and scanned but later turn out to be incomplete. In this scenario given the episode has been scanned already, the medical secretarial staff would be responsible for scanning the loose documentation relating to the episode of care, the guidance in this scenario is that this documentation should be scanned under episode date of discharge , however this would appear as a second episode for the same discharge date. It is possible that in this scenario some staff have scanned this information under date scanned rather than discharge date which could in turn lead to notes appearing many months after discharge.	We did find examples of incremental scanning. However, we coded these episodes as having IMN filed by date of discharge if the final scanned document was under the discharge date.

	There is a Board wide QRG for scanning and also the Incremental scanning process documents. Clearly the Board would like details of individual case records to address where this was identified.	We have detailed narrative notes about information obtained from scanned and digital records for each of the episodes in the review.

Appendix 3

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Commented [MS1]: The comments in this appendix are similar to or an expansion of comments in the main proforma response and have been answered there.

Commented [mw2]: We could simply amend line 2251 as follows:

We have reservations about the reliability of SPC charts used in this setting (although GGC followed a process as recommended by HPS).

The fact that their experience led to a new methodology is an acknowledgement that the original version was not optimal.

17. IMT Ward 6A Gram Negative Blooc

7. There is now an agreed new approach in place which has been advised by HPS and is undergoing evaluation by GGC/HPS for potential use in other areas.

Paediatric haemato-oncology a

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- There is no discussion about the relative endogenous nature of this organism and relative environmental exogenous nature.
- Water sampling has rarely identified this organism.
- Lines 2276-2295: This is a retrospective judgement which does not provide context nor detail of how cases were highlighted and indeed the HPS report of 2019 which reviewed this in detail, GGC followed national process, engaged the expertise of HPS and SG HAI policy unit throughout this period and is now engaged in piloting a new approach with HPS.
- Line 2299 – 2300: The report which GGC sent to HPS in October and updated in November sets out a full review of the actions from 2018 onwards (see section 11)

211119 NHSGGC QEUH Ward 6A Actic

Lines 2306-2325 – Example 8.3

This is a misleading example as it suggests GGC acted outwith national policy and was not following advice. GGC **did** report all cases, **did** use run charts and **did** investigate them. The CNO had invoked the national framework tool on 26th March 2018 giving HPS a leadership role. HPS and the Scottish Government were closely involved and received and advised on reports. It would be helpful to put this into context:

- In 2021, Enterobacter was not listed as an alert organism in the NIPCM; it was added to the GGC alert list in 2018
- Surveillance was used at the time with run charts which is consistent with national methodology
- The HIIAT Score was **not** queried by HPS and seems to us that this is a retrospective judgement
- 3 of the 5 cases not considered HAI – this was consistent with national methodology with unique typing of 2 cases
- **All** cases were added to the master list at the time of all cases to HPS for the water incident.

Line 2343: Example 8.4

- There was full advice and support from HPS who are required to ensure that the HAI/AMR Policy Unit are kept fully appraised with all developments; an example of one of these reports is given below.


2018-04-13 email.doc


HIIORT 2A Water supply 130418.doc

- The IMT was stepped down with full involvement with HPS and SG HAI policy unit: the detailed reasons are provided in the minute with clear triggers established and agreed and set out below;

- The SG HAI policy unit had requested directly all information by COP 25th of June for review. In addition, they were briefed directly by HPS after each IMT. They did not query the information nor the decision to step down the IMT.
- The 2 cases referred which are referenced were not HAI cases and indeed one came from another board.

- Lines 2349-2369 – **Adequacy of IMT meeting records**
- Many of the issues set out in this section highlight the areas which the revised outbreak policy and SOP seek to address: there was a review by the board following concerns highlighted by members of the IMT in September 2019 of inappropriate behaviour and lack of structure to the IMT.


IMT Discussion note - Tues 20 Augu

- The revised outbreak policy and the revised SOP seeks to provide more robust measures to address this.
- A full response and collation of timelines was sent to HPS in late 2019 of the whole incident in 2018 and 2019.

Line 2365 Please note that an example has been given in the Proforma of a detailed case timeline tracked across a number of IMT meetings

8.2.2.4 Upward reporting from IMT meetings

Lines 2396 – 2415

This is factually incorrect and we would request that this is reviewed.


CasenoteHAIRTFI (002).doc

From: [redacted]
To: [redacted]
Subject: Fw: drains
Date: 13 September 2018 17:45:33
Importance: High

See below FYI

Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital
Glasgow
Direct dial : [redacted]

From: Susanne Lee
Sent: 13 September 2018 17:38
To: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Subject: RE: drains

Dear Teresa
I am so sorry having to deal with this situation and concerned that, as you mentioned yesterday, the drains appear to be blocking and you are again seeing black gunge even after cleaning and disinfecting. As discussed I am aware of a few problems relating to drains in new hospital builds; in one case there was insufficient fall on the drains from sinks to the main drain (should look like a herringbone with a gradual fall), in another there was insufficient capacity, i.e the pipe size was not man enough for the job and in another builders debris left in the pipework . This is exacerbated when there is also use of disposable wipes and nappy liners which is quite likely in a children's unit with parents caring for their children. Experience with drain disinfection, is that it is only a very short term measure, it will not prevent further backflow and there is also a risk of encouraging microbial resistance.
The use of filters on small hand wash basins is also not ideal as there is insufficient activity space, and a real risk that splashback will contaminate the filters and sinks and then the hands and clothing of staff and patients.
Taking all this into account I sadly agree with you that in the interests of these very vulnerable patients that closing the unit and getting to the root cause of the problem is necessary. You have to take a precautionary approach for their sake. This will give some time to investigate the root cause; do a proper drain investigation and survey to investigate why the drains are blocking, it will also allow some time to replace drains, sinks and outlets where necessary .
I am around tomorrow in between appointments if you need further input.
Kind regards
Susanne

From: INKSTER, Teresa (NHS GREATER GLASGOW & CLYDE)
Sent: 13 September 2018 17:16
To: Susanne Lee
Subject: drains

HI Susanne
Further to our conversation yesterday we had a further IMT today. Staff continue to report issues with the drains and we now have 5 bacteraemias linked to the current incident.
I have today recommended decant of the unit as I am concerned we have not established the cause of the issue.
As per our conversation yesterday I have suggested a drain survey, use of scopes to look for blockages and continued cleaning.
This issue appears to be widespread throughout the childrens hospital
Is there anything else we should be doing ? Can you think of any reason why we might be having this issue with reflux of black material up the drains , just a few weeks after cleaning?
Kind regards
Teresa

Dr Teresa Inkster
Lead Infection Control Doctor NHSGGC
Training Programme Director Medical Microbiology
Dept of Microbiology
Queen Elizabeth University Hospital

Glasgow
Direct dial : [redacted]

****

Infection control/Microbiology overview

Teresa Inkster
Christine Peters

Historical aspects

- Personal experience of issues within IPCT SMT date back to 2012
- Two significant outbreaks in the renal unit
- Lack of support from SMT, bullying behaviour
- Definitions of HAI contested
- Laboratory methods challenged

VRE +PCP outbreaks

- Both complex incidents
- Emerging pathogens
- New route of transmission for PCP

- ‘Out of comfort zone’

- No national guidance translated to mean we do nothing

2014 - CP

- Previous significant IC experience
- Joined a team – clearly dysfunctional at outset
- Raised issues with management repeatedly
- Bullying and undermining and public humiliation
- Confusion re roles , minutes, told not to put in writing “because of inquiries and things”
- Vol Leven report meeting
- Repeatedly asked re new building handover, misinformation given by SMT

June 2015

- Meeting re new build
- VHF planning – discovered that huge problems with validation and handover and design
- Escalated summaries to ICM and lead ICD, and AICC and asked advice on how was to be progressed
- Neurosurgical theatres – complete undermining and lack of support
- Followed by resignations July 2015 – letters written

Adult BMT key findings

- No positive pressure
- No monitoring gauge
- ACH too low
- No air sampling prior to move,no water results
- Rooms not sealed
- Pentamidine room positive pressure
- Clear that project team claimed they did not know immune suppressed accomodation required

Culture

- Lack of respect
- Undermining
- ICM going to HOS undermining
- Exclusion
- Stalling
- Blocked from comminucations
- Ridicule

Paediatric BMT –key findings

- Holes in ceiling
- Workmen still in unit
- Child about to undergo transplant
- NO fit for purpose BMT rooms

Culture

- Accused of being “well rehearsed”
- Undermining
- Lack of respect
- HOS quoted on mortality rates – HOS had not discussed with ICD
- Threatening behaviour
- Little written communication / record keeping
- Air sampling demanded by HAI exec lead – waste of lab resource

VHF

- Room not fit for purpose
- Drainage issue
- Uncleanable from VHF point of view
- Confusion re responsibility
- High risk situation

Letter to David Stewart/HR review 9/11/2015

- New Build
  - Adult BMT
  - Childrens BMT
  - Isolation Critical care
  - Decon room
  - Other clinical areas
- Old Build
  - neurosurgery
- Outbreaks /incidents
  - NICU serratia/Pseudomonas
  - Ebola

  - External review requested

Period post DS – April 2016

- Adult BMT
  - TI three weeks prior to move back to lead on Adult BMT
  - Completely excluded from previous comms and meetings despite being regional ICD
  - No handover provided
  - Clear no remedial action had been taken
  - Requested support of HPS
  - Spec had not been met
  - Moved back had to be postponed again

Culture

- TI perceived as being difficult and “risk averse”
- No forthcoming information from estates on critical details
- Lack of support from IPCT SMT – did not attend meetings
- HPS supportive

Cystic Fibrosis - Mycobacterium abscessus outbreak

- Misinformation
- Denial
- Lying regarding knowledge of situation
- Report written - ? What actions taken
- Still outstanding final publications of incident
- Threatening behaviour to ICM to Lead ICD
- Decided this team was entirely unsafe to work with

April 2016

- Appointed lead ICD
- Brief 1 hour handover
- Prioritisation of issues

  - neuro theatres/sewage leaks

  - adult BMT

  -PPVL/negative pressure rooms

  -upgrade paed BMT rooms

Culture

- Obstruction from Director of facilities
- ‘ This is a new way of working that we have to get used to’
- Tolerated but not embedded
- Difficult relationship with lead nurse for RHC. Issues with definitions in particular. The ‘Braehead definition’

June 2017

- Escalation of SMT pressure on Lead ICD , with going to HOS to get a different view
- CP escalated situation to CD
- TI went off ill mid june

June 2017

- BJ appointed as lead ICD , [redacted] took on local session
- Wanted to resign 10 weeks later
- [redacted] expressed feelings of pressure and bullying and being forced into signing off adult BMT without information as well as being ignored regarding water testing for steno on 2A and pseudomonas on PICU

- Microbiologists noted rates of bacteraemias on 2A and raised concerns
- Whistle blow stage one – SBAR written with many issues
- PV, AB, [redacted] resigned
- Interim measures taken all microbiologists involved
- Meeting with HOS, CoM, others
- SBAR written re all views of microbiologist

Culture

- Intimidation
- Outnumbering
- Ridicule
- Lack of documentation
- Threatening

- Gram negative bacteraemia rates mentioned repeatedly – advised CPHM would sort out and look at epidemiology
- Microbiology HCS was asked to stop alerting IPCT to infections
- Communication and handover absent from HOS, Lead ICD and HOD

Jan 2018

- Return to work – 1st day RTW interview
  - demotion
  - conflict of interest re TPD role
  - unsupported
  - HOS to retain BMT projects
- No handover
- Told to delete all emails

Chaired IMT for complicated water incident while on phased return . No additional ICD/micro resource allocated

Water IMT

- Lack of information sharing
- Slow progress
- Initial recommendations April 2018, not implemented until Oct 2018
- Lack of national guidance
- Unwillingness to make decisions
- No contingency plans
- Governance of Water technical group

Water incident

- Reports available July 2018 – DMA legionella risk assessment
- Review to be undertaken and lead ICD to be seconded
- Change of plan – COO , ICM and Facilities Director to investigate
- Dec 2018 – clinicians raise concern re 2017 cases and ? Deaths linked to water

Water incident

- Meeting with clinicians and lead ICD late Dec 2018
- Data gathering, case ascertainment and analysis of reports by lead ICD Jan 2019
- Discussion with Medical director Feb 2019 requesting retrospective case note review and duty of candour
- Meeting with COM and Haem lead – agreed retrospective review needed
- Told review team would be covering lead ICD at time, CPHM , ANDIPC - stressed not independent
- Emails in August from haem lead – no review undertaken

Nov 2018 +

Several complex incidents

1) Cowlairs
2) Cryptococcus
3) Mucor
4) 6A bacteraemias and M chelonae

Common themes

- Lack of respect for ICD
- Unwillingness to take advice
- Wikipedia/google IMTs
- Comms – repeated failures, no learning, not willing to take advice from clinicians. Inaccuracies in media statements. IMT chair no ability to influence comms. Continual failure to provide timely and adequate comms to families and patients
- Continual challenging despite robust scientific evidence
- Sexism
- Poorly defined roles and responsibilities
- Lack of leadership
- ‘ Every meeting a battle’ HPS only support

- Pre meetings – viewed with suspicion by clinicians
- Post meeting director calls - ? Who was representing IC.
- Changes to IMT advice being made at director meetings
- Governance issues with subgroups from IMTs

May 2019 – M chelonae

- Reluctance to accept HAI status and water supply as source
- Told to sample home water
- Duty of candour failure with parent despite IMT plans to speak with families

August 2019 – 6 A IMT

- Inaccuracies around chilled beam leaks
- Lead ICD invites colleagues to attend
- Post meeting described as a dreadful IMT with bad behaviour from diagnostic staff
- Chair (lead ICD) asked to demit
- New chair appointed (CPHM)
- ‘there is nothing to see here, move along’

September 2019 – lead ICD resigns

- ‘out on a limb’
- ‘Lone voice’
- ‘leaving a trail of destruction’
- ‘politically naïve
- ‘bonkers’
- ‘ hypervigilent ICD
- Hysterical
- Over the top bad behaviour
- Not endorsing collective leadership

Summary of key issues

1) IC culture ;

undermining, lack of respect

downplaying of incidents

lack of openness and transparency

poor governance

Ill defined roles and responsibilties

2) Microbiology culture

- Bullying , undermining, lack of respect
- Sexism
- Accusations of empire building
- Shouting, physically threatening behaviour
- Exclusion
- Lack of communication
- Unsupportive
- Power plays and psychological maniplation
- Gaslighting
- Lack of acceptance of repeated evidence of severe understaffing and consequent burn out of consultants at QEUH
- Mocking
- Governance obscured
- Meetings framed and not open
- Chaotic approach to decision making
- Complete absence of trust at this point between QEUH and laboratory management structure

3) Communications and DOC

- Inaccuracies and lies in public statements
- Poor content
- Inability of IMT chair to influence composition or decision to release
- Failed duty of candour, poor Comms to families and patients

4) Governance

- No clear roles and responsibilities
- Unqualified individuals making key decisions or overruling experts
- Subgroups of IMTs – who do they report to?
- Poor documentation of decision making
- No handovers
- Problems with minutes and document control
- ICDs leave issues

Entrenched ideas

- Typing in environmental incidents
- Environmental sampling
- Definitions of HAI
- Benchmarking
- HIIATS – day of scoring
- SPC charts
- Triggers
- No national guidance

Notes on HIS report into the QEUH November 2022 for INWO
Dr Christine Peters
7/12/2022

Introduction

The HIS report has been quoted as being a quality assurance inspection regarding infection control at the RHC and QEUH. This inspection was apparently in response to historical concerns regarding Aspergillosis and overlapped in time with my raising concerns to INWO in writing regarding overall management of incidents and environmental monitoring

Limitations

1. Lack of relevant expertise
   The main limitation of this report is that the HAI Standards referred to do not include the relevant environmental parameters such as water and ventilation safety. As the authors state this is out with their expertise, it seems obvious that the inspection cannot be utilised to give reassurance regarding the water and ventilation as it stands. It would seem more appropriate to have ASSURE and ARHAI as expert input into the inspections relating to these factors given they have been set up in the aftermath of the QEUH building failings. Was this expertise sought? This report is therefore in no way reassuring on these specifics.

2. Lack of scientific reasoning for the statements on Aspergillus surveillance
   Firstly the authors do not note information and guidance that is already in existence for guidance on managing and is clearly signposted on the website which is an important omission for their conclusions to stand:

   https://www.hps.scot.nhs.uk/web-resources-container/information-for-staff-on-aspergillus-spp/

   Secondly they quote one expert's opinion, without demonstrating how that expert was chosen, nor why ASSURE expertise would be bypassed, nor the evidence shared nor the relevant outbreak and environmental monitoring expertise and literature to back up the recommendation made. They do not for example go into his assessment of any specific concerns that I had already raised with INWO.

3. Poor ascertainment methodology for case finding – they seem to have relied on searching through AICC minutes and asking ARHAI for reports. A more useful method would have been to speak to the Clinical Microbiology team for information on cases identified. The timeframe not only omits the time frame for the original cases that precipitated the concerns, but also was randomly limited to certain 10 month time period without any clarity as to why this timeframe was chosen. It would be more appropriate to do case ascertainment using all lab reports including fungal bio markers and asking for clinical cases that had been treated as invasive fungal infection over a number of years. The key question is if they were not reported – how many actual cases were there and did they explore the management of those cases ?

4. They conclude there was a laboratory error in sample processing. As clinical lead for the laboratory I am not aware of such an error. Perhaps they mean contamination? Either way

It would have been helpful to discuss with Microbiology, not just an ICD. This reads like a limited and selected example. The cases that concerns were raised about are notably absent as are all the cases not reported to ARHAI. Again this fails in qualifying as an assurance exercise.

5. Regarding communications the authors have entirely omitted communication with Microbiology which is a current stream of management work to improve so it is incomplete to exclude this important interaction – given that Microbiology continue to make the diagnosis, treatment decisions and cover IPC OOH. A reading of the minutes of the Microbiology consultants meetings at QEUH may have given them some different information like when qualified Microbiologists with many years IPC experience raise concerns – what happens?

6. Relying on on the day of inspection (which was expected post March and therefore not really “unannounced” and a full 6 months after the Scottish Government announced their intent to request assurance from HIS) to assess HAISCRIBE was not adequate. I have already submitted examples of serious poor practice in this regard. Again in excluding Microbiology they omitted key and worrying information.

7. The ICNET system for picking up surveillance is not an issue that has been raised, rather the inadequacy of the triggers being set which do not take into account the types of organisms, not just individual alerts. I have emails pertaining to this. HIS authors completely omit to comment on the appropriateness of the triggers and again ARHAI input should have been sought.

8. There is no reference to the already published findings of the Oversight Board or the Case Note review and their recommendations. Instead they only refer to their own previous reports, thus adding to the lack of joined up expert input into oversight and governance.

9. They did not visit ward 61, the neurosurgical ITU that forms the basis of my complaint. This seems very strange as it is one of the highest risk settings and their previous report had highlighted problems in that building.

10. The setting up and terms of reference of the Infection Control in the Built Environment Group is not explored and would seem crucial to the assessment of the GGC repose to all the issues previously identified

11. There is no assessment of the weekly report that is shared with Microbiology as to its reliability

12. There is no assessment of data on the Environmental Gram negative infections that were the key concern post Case Note Review and therefore assurance is without foundation on data – rather based on self reporting of impressions.

13. No sign of an ASSURE statement on their analysis of the 2A opening with the water results being positive and filters still being in place.

14. The Timeframe quoted excluded situations that I have highlighted as problematic. This is worrying as it continues with the theme of actions and improvements being undertaken only

after there is a whistleblow process in the offing, rather than a change in team approach to learning as well as an deflecting away from proper analysis of problems.

Serious Concerns Raised by Report

Despite these significant limitations the report does highlight issues that support my complaint a year ago:

1. Lack of GGC reporting to ARHAI in accordance with the guidance on *Aspergillus sp*
2. Gaps in governance, notable non attendance at water safety meetings which was a recommendation as far back as the Vale of Leven report.
3. Out of date water risk assessments – a key component of the findings of the Oversight Board
4. The absence of a ventilation group till June (note my complaint pre dates this by a number of months) – what happened to the specialist ventilation group that I sat at in 2019 set up by Dr Inkster?
5. Informal processing of validation reports – this seems incredible in the light of all the assurances this was all being governed differently since the setting up of the Infection Control in the Built Environment Group
6. Absence of a clear plan around Point of Care filters which in fact have never been installed in the ICUs. They do not comment on this absence and if it is in keeping with the original risk assessments – likely because it is out with their expertise.

In conclusion this does not seem to me to be an impartial and thorough quality assurance process in the light of my knowledge base and experience within the hospital and leaves the national governance and quality assurance of infection control as questionable, especially in the light of a purposeful exclusion of the Microbiology Consultants which in the light of recent history seems remarkable.

Bundle of documents for Oral hearings commencing from 19 August 2024 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 27 – Miscellaneous Document – Volume 6

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