

APPENDIX - 1**Healthcare Associated Infection Reporting Guidance, Glossary, Definitions and Infection Control Targets****Purpose:**

This paper can be referred to when reading the HAIRT Reports, it covers any Scottish Government guidance and aims relating to Infection Prevention and Control (IPC), list of abbreviations and definitions for some of the medical terms or infection types mentioned in the HAIRT reports. It also includes some systems and process that have been put in place by IPC to reduce the harm from infections and prevent them from happening.

Glossary of abbreviations

Following feedback from stakeholders, below is a list of abbreviations used within this report:

AOP	AOP Annual Operational Plan
ARHAI	Antimicrobial Resistance Healthcare Associated Infection
CDI	<i>Clostridioides difficile</i> infection
CPE	Carbapenemase producing Enterobacteriaceae
CVC	Central Venous Catheter
ECDC	European Centre for Disease Control
HAI	Hospital Acquired Infection (not present or incubating on admission to hospital and arising \geq 48 hours after admission). Please note this excludes COVID-19 cases (hospital onset currently thought to be >14 days).
HCAI	Healthcare Associated Infection
HEI	Healthcare Environment Inspectorate
HIAT	Healthcare Infection Incident Assessment Tool
HPV	Hydrogen Peroxide Vapour
IMT	Incident Management Team
IPCAT	Infection Prevention and Control Audit Tool
IPCN	Infection Prevention and Control Nurse
IPCT	Infection Prevention and Control Team
IVAD	Intravenous/Intravascular Access Device
MRSA	Meticillin Resistant <i>Staphylococcus aureus</i>
NES	NHS Education for Scotland
PAG	Problem Assessment Group
PEG	Percutaneous Endoscopic Gastrostomy
PICC	Peripherally Inserted Central Catheter
PVC	Peripheral Vascular/Venous Catheter
SAB	<i>Staphylococcus aureus</i> bacteraemia
SG	Scottish Government
SGHSCD	Scottish Government Health and Social Care Directorate
SICPs	Standard Infection Control Precautions
SSI	Surgical Site Infection
UCC	Urinary Catheter Care
UTI	Urinary Tract Infection
SPC	Statistical Process Control: An analytical technique that plots data over time. It helps us understand variation and in so doing, guides us to take the most appropriate action. SPC is a good

technique to use when implementing change as it enables us to understand whether changes made have resulted in an improvement.

Datix The software used by NHS Greater Glasgow and Clyde for clinical and non-clinical incident reporting (and managing complaints and legal claims) and forms part of the Risk Management Strategy. It is a web-based application that allows any staff member with access to StaffNet to report an incident.

Definitions used for *S. aureus* and *E. coli* bacteraemias

Definition of a bacteraemia

Bacteraemia is the presence of bacteria in the blood. Blood is normally a sterile environment, so the detection of bacteria in the blood (most commonly accomplished by blood cultures) is always abnormal. It is distinct from sepsis, which is the host response to the bacteria. Bacteria can enter the bloodstream as a severe complication of infection, (like pneumonia, meningitis, urinary tract infections (UTI) etc.), during surgery, or due to invasive devices such as peripheral vascular catheters (PVC), Hickman lines, urinary catheters etc. Transient bacteraemias can result after dental procedures or even brushing of teeth although this poses little or no threat to the person in normal situations.

Bacteraemia can have several important health consequences. The immune response to the bacteria can cause sepsis and septic shock which has a high mortality rate. Bacteria can also spread via the blood to other parts of the body (haematogenous spread), causing infections away from the original site of infection, such as endocarditis (infection of the heart valves) or osteomyelitis (infection of the bones). Treatment for bacteraemia is with antibiotics for many weeks, in some circumstances however, cases such as *S. aureus* bacteraemia, usually 14 days of antibiotic therapy is required.

Origin Definitions for Bacteraemia Surveillance

<https://www.ARHA1.scot.nhs.uk/web-resources-container/protocol-for-national-enhanced-surveillance-of-bacteraemia>

Healthcare Associated Infection	<p>Hospital Acquired Infection</p> <p>Positive blood culture obtained from a patient who has been hospitalised for ≥48 hours. If the patient was transferred from another hospital, the duration of in-patient stay is calculated from the date of the first hospital admission.</p> <p>If the patient was a neonate / baby who has never left hospital since being born. OR The patient was discharged from hospital in the 48 hours prior to the positive blood culture being taken. OR A patient who receives regular haemodialysis as an out-patient. OR Contaminant if the blood aspirated in hospital. OR If infection source / entry point is surgical site infection (SSI). <i>[This will be attributed to hospital of surgical procedure]</i></p>
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	<p>Healthcare Associated Infection</p> <p>Positive blood culture obtained from a patient within 48 hours of admission to hospital and fulfils one or more of the following criteria:</p> <p>Was hospitalised overnight in the 30 days prior to the positive blood culture being taken. OR Resides in a nursing, long-term care facility or residential home. OR IV, or intra-articular medication in the 30 days prior to the positive blood culture being taken, but excluding IV illicit drug use. OR Had the use of a registered medical device in the 30 days prior to the positive blood culture being taken, e.g. intermittent self-catheterisation or Percutaneous Endoscopic Gastrostomy (PEG) tube with or without the direct involvement of a healthcare worker (excludes haemodialysis lines see HAI). OR Underwent any medical procedure which broke mucous or skin barrier, i.e. biopsies or dental extraction in the 30 days prior to the positive blood culture being taken. OR Underwent care for a medical condition by a healthcare worker in the community which involved contact with non-intact skin, mucous membranes or the use of an invasive device in the 30 days prior to the positive blood culture being taken, e.g. podiatry or dressing of chronic ulcers, catheter change or insertion.</p>
Community Acquired Infection	<p>Positive blood culture obtained from a patient within 48 hours of admission to hospital who does not fulfil any of the criteria for healthcare associated bloodstream infection.</p>

Healthcare Associated Infection (HCAI) Surveillance

NHSGGC has systems in place to monitor key targets and areas for delivery. The surveillance and HCAI systems and ways of working allow early detection and indication of areas of concern or deteriorating performance.

***Staphylococcus aureus* bacteraemia (SAB)**

All blood cultures that grow bacteria are reported nationally and it was found that *S. aureus* became the most common bacteria isolated from blood culture. As *S. aureus* is an organism that is found commonly on skin, it was assumed (nationally) that bacteraemias occurred because of the presence of a device such as a PVC, and as such a national reduction strategy was initiated and became part of the then HEAT targets in 2006. The target was a national reduction rather than a Board-specific reduction however the latest target set for 2019-2022 is Board-specific, based on the NHS Boards current infection rates.

NHSGGC's Approach to SAB Prevention and Reduction

All *S. aureus* bacteraemia are monitored and reported by the IPCT. Investigations to the cause of infection consist of examining the patients notes, microbiology, biochemistry and haematology reports to identify potential causes of the infection; from this, in most cases, a provisional cause is identified however if necessary, this is discussed further with the clinical team responsible for the management of the patient to assist further with the investigation. Any issues identified during the investigations, such as incomplete bundle* etc. is highlighted at this time, and where appropriate, a DATIX report is generated. Once a conclusion has been agreed, the information is discussed with the Infection Control

Doctor and outcomes agreed. This information is part of mandatory reporting and is submitted to ARHAI quarterly.

- * Care “bundles” are simple sets of evidence-based practices that when implemented collectively, improve the reliability of their delivery and patient outcomes. There are several care bundles in use within GGC, e.g. PVC, Central Venous Catheter (CVC), SSI and Urinary Catheter Care (UCC). Compliance with these bundles is monitored via the IPC Audit Tool (IPCAT) and if there is an outbreak or incident.

Information on patients with SABs are available to the Directorate/ Division in three ways; in their monthly summary reports, quarterly in a SAB specific report and via the micro strategy dashboard monthly GGC acute operating division report is also produced and this is presented as a summary at the Acute Clinical Governance Committee. All SABs associated with an IVAD are followed-up by an audit of PVC/CVC practice in the ward or clinical area of origin, and the results are returned to the Chief Nurse for the Sector/Directorate. The analysis of the data and subsequent SAB reports enable the IPCT to identify trends in particular sources of infections such as Hickman line infections etc., and it also enables the IPCT to identify areas requiring further support. The data also influences the elements contained in the IPC Annual Work Plan and the IPCQIN.

Continual monitoring and analysis of local surveillance data, enables the IPCT and managers to identify and work towards ways to reduce infections associated with IVADs. All SABs are reviewed and investigated fully and highlighted to the patients’ clinicians, nursing staff and management. Where appropriate, a DATIX is generated to enable infections that require learning is shared and discussed at local clinical governance meetings.

IV Access Device (IVAD) Associated SABs

In addition to the nationally set targets, infections from an Intra-vascular access device caused by *S. aureus* are investigated fully and reported.

Healthcare Associated Infection Standards – local reduction aims							
<ul style="list-style-type: none"> <i>S. aureus</i> bacteraemia – reduction of 10% from 2019 to 2022 							
Local quarterly reduction aim charts have been produced for GGC as a whole and for the five Acute Sectors							
	2018/19 Rate (base line) per 100,000 total bed days	No of HCAI cases (per annum)	Reduction %	Date for reduction	Target HCAI rate per 100,000 total bed days	Target HCAI cases per annum	Target HCAI cases per month
SAB	19.3	324	10	2022	17.4	280	23

Sector/Directorate local reduction aims – September and October 2021 cases			
	Patient cases	Aim per 2 months	Status
Clyde Sector	10	10	On aim
North Glasgow Sector	14	12	Above aim
Regional Services	10	8	Above aim

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South Glasgow Sector	9	14	Below aim
Women's & Children	8	2	Above aim
GGC Total	51	46	Above aim

Sector/Directorate reports are issued for action by Sector/Directorate teams.

All Acute hospital cases are prospectively available on MicroStrategy IPC dashboard.

Escherichia coli bacteraemia (ECB)

NHSGGC's approach to ECB prevention and reduction

E. coli is one of the most predominant organism of the gut flora, and for the last several years the incidence of *E. coli* isolated from blood cultures, i.e. causing sepsis, has increased to the point that it is the most frequently isolated organism in the UK. As a result of this, the HAI Policy Unit has now included *E. coli* as part of the AOP targets. The most common cause of ECB is from complications arising from UTIs, hepato-biliary infections (gall bladder infections) and infections associated with urinary catheters. It should be acknowledged that there is limited number of possible interventions to target ECB because infections are often spontaneous and not associated with health care or health care interventions.

Daily case totals for all three HCAI standards are reported to the IPC Senior Management Team to provide a prospective update on the current situation within the Board.

Healthcare Associated Infection Standards – local reduction aims

- *E.coli* bacteraemia – initial reduction of 25% by 2021/2022

Local reduction aim charts have been produced for GGC as a whole and for the five Acute sectors. The IPC Work Plan for 2020/2021 includes the development of tools to assist clinical teams to improve the incidence of *E. coli* bacteraemia.

	2018/19 Rate (base line) per 100,000 total bed days	No of HCAI cases (per annum)	Reduction %	Date for reduction	Target HCAI rate per 100,000 total bed days	Target HCAI cases per annum	Target HCAI cases per month
ECB	38.1	638	25	2022	28.6	452	38

Sector/Directorate local reduction aims - September and October 2021 cases

	Patient cases	Aim per 2 months	Status
Clyde Sector	16	18	Below aim
North Glasgow Sector	28	24	Above aim
Regional Services	14	8	Above aim
South Glasgow Sector	25	24	Above aim
Women's & Children	7	2	Above aim
HSCP	3	2	Above aim
GGC Total	93	78	Above aim

All Acute hospital cases are prospectively available on MicroStrategy IPC dashboard.

Clostridioides difficile infection (CDI)

Reporting to ARHAI of *C. difficile* infections has been mandatory for several years in NHS Scotland. NHSGGC has met its targets over the years and has maintained a low rate of infection. Similar to the

SAB target, the new target set for 2019-2022 is based on our Board’s rate rather than an overall national rate.

C. difficile can be part of the normal gut flora and can occur when patients receive broad-spectrum antibiotics which eliminate other gut flora, allowing *C. difficile* to proliferate and cause infection. This is the predominant source of infection in GGC. *C. difficile* in the environment can form resilient spores which enable the organism to survive in the environment for many months, and poor environmental cleaning or poor hand hygiene can lead to the organism transferring to other patients, leading to infection. Another route of infection is when a patient receives treatment to regulate stomach acid which affects the overall pH of the gut allowing the organism to proliferate and cause infection.

Origin definitions for *Clostridioides difficile* infections

Local Enhanced CDI Surveillance in NHSGGC: Definition of Origin	
Hospital acquired CDI	is defined as when a CDI patient has had onset of symptoms at least 48 hours following admission to a hospital.
Healthcare associated CDI	is defined as when a CDI patient has had onset of symptoms up to four weeks after discharge from a hospital.
Indeterminate cases of CDI	is defined as a CDI patient who was discharged from a hospital 4-12 weeks before the onset of symptoms.
Community associated CDI	is defined as a CDI patient with onset of symptoms while outside a hospital and without discharge from a hospital within the previous 12 weeks; or with onset of symptoms within 48 hours following admission to a hospital without stay in a hospital within the previous 12 weeks.

NHSGGC’s Approach to CDI Prevention and Reduction

Similar to our SAB and ECB investigation, patient history is gathered including any antibiotics prescribed over the last several months. Discussions with the clinical teams and microbiologists assist in the determination and conclusion of the significance of the organism, as occasionally the isolation of the organism can be an incidental finding and not the cause of infection. Data is shared with the antimicrobial pharmacist and cases are discussed at the Antimicrobial Management Group to identify inappropriate antimicrobial prescribing. Daily case totals for all three HCAI standards are reported to the IPC Senior Management Team to provide a prospective update on the current situation within our Board.

Healthcare Associated Infection Standards – local reduction aims <i>C. difficile</i> – reduction of 10% from 2019 to 2022							
	2018/19 Rate (base line) per 100,000 total bed days	No of HCAI cases (per annum)	Reduction %	Date for reduction	Target HCAI rate per 100,000 total bed days	Target HCAI cases per annum	Target HCAI cases per month
CDI	19.0	318	10	2022	17.1	204	17

Sector/Directorate local reduction aims – September and October 2021 cases			
	Patient cases	Aim per 2 months	Status
Clyde Sector	5	8	Below aim
North Glasgow Sector	13	10	Above aim
Regional Services	4	4	On aim

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South Glasgow Sector	12	10	Above aim
Women's & Children	0	2	Below aim
GGC Total (excludes GP cases)	34	34	On aim

*7 GP cases were healthcare associated. All Acute hospital cases are prospectively available on Micro-Strategy.

Surgical Site Infection (SSI) Surveillance

SSI surveillance is the monitoring and detection of infections associated with a surgical procedure. In GGC the procedures included are hip arthroplasty, Caesarean-section, major vascular surgery and large bowel surgery. These are all mandatory procedure categories for national reporting. In addition, the IPCT undertake surveillance on knee arthroplasty, repair of fractured neck of femur and in the Institute of Neurological Sciences (QEUH campus), spinal and cranial surgery. The IPCT monitor patients for 30 days post-surgery and for those procedures with implants, up to 90 days post-surgery including any microbiological investigations from the ward for potential infections and also hospital re-admissions relating to their surgery. Any mandatory procedure category infection associated with a surgical procedure is reported nationally to enable board to board comparison. GGC infection rates are comparable to national infection rates.

NHSGGC's Approach to SSI Prevention and Reduction

SSI criteria is determined using the European Centre for Disease Control (ECDC) definitions. Any infection identified is investigated fully and information gathered including the patients' weight, duration of surgery, grade of surgeon, prophylactic antibiotics given, theatre room, elective or emergency, primary theatre dressing, etc. can provide additional intelligence in reduction strategies. The IPCT closely monitor infection rates, and any increased incidence of SSIs are prospectively reported to management and clinical teams, and Incident Management Team (IMT) meetings are held.

Meticillin resistant *Staphylococcus aureus* (MRSA) and *Clostridioides difficile* recorded deaths

The National Records of Scotland monitor and report on a variety of death causes recorded on the death certificate. Two organisms are monitored and reported; MRSA and *C. difficile*. Please click on the link for further information:

<https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/deaths>

COVID-19

Public Health Scotland now publish weekly reports on the incidence of COVID-19 in Scotland. These are available at: <https://beta.isdscotland.org/find-publications-and-data/population-health/covid-19/covid-19-statistical-report/>

Further information on Coronavirus (COVID-19) data, intelligence and guidance is available at: <https://www.publichealthscotland.scot/our-areas-of-work/sharing-our-data-and-intelligence/coronavirus-covid-19-data-and-guidance>