Prevalence Survey of Hospital Acquired Infection and Antimicrobial Prescribing

Northern Ireland Data Collection

(Adapted from the original © ECDC Protocol: v5.3)

Codebook

2017

Contents

Acknowledgements

This codebook follows the PPS protocol produced by ECDC. It also benefits from inputs from colleagues working in Northern Ireland and in the Republic of Ireland. It has been customised for use in hospitals in Northern Ireland. We welcome further comments, additions, deletions and any other changes needed to improve the quality of the instructions for our local use.

Patient section: Ward Specialty

Table 1 - Ward specialty codes	Categories (ward specialty)
SURGERY	Choose for majority of acute surgical wards to which patients with a variety of surgical conditions are generally admitted
MEDICINE	Choose for the majority of acute medical wards to which patients with a variety of medical conditions are generally admitted
INTENSIVE CARE	Intensive care unit for adult patients Remember NICU is coded as NEONATAL and PICU is coded as PAEDIATRICS High dependency unit is not coded as ICU – Choose SURGERY or MEDICINE instead
GYNAECOLOGY/OBSTETRICS	Choose if >80% of patients on the ward belong to the GYNAECOLOGY/OBSTETRICS specialties
PAEDIATRICS	Paediatrics including Paediatric ICU (PICU)
NEONATAL	Neonatology including Neonatal ICU (NICU)
GERIATRICS/CARE OF THE ELDERLY	Geriatrics or medicine for the elderly – Choose if >80% of patients on the ward belong to the GERIATRICS/CARE OF THE ELDERLY specialty
PSYCHIATRY	Choose if >80% of patients on the ward belong to the PSY specialty
REHABILITATION	Choose if >80% of patients on the ward belong to the RHB specialty
OTHER	Choose if <80% of patients on the ward belong to a single specialty, but there are mixed medical and surgical patients admitted to the ward. Also choose for admitted patients who remain in the ED or who are accommodated on a Day ward as admitted patients
MIXED WARD	Mixed – Choose if <80% of patients on the ward belong to a single specialty but there are only two specialties of patients admitted to the ward (e.g., haematology & oncology)

Patient section: Consultant Specialty

Ward specialty codes	Consultant specialty name	Consultant specialty code
SUR - SURGICAL SPECIALTIES	General surgery	SURGEN
	Digestive tract/bowel surgery	SURDIG
	Orthopaedics	SURORTO
	Cardiac surgery	SURCARD
	Vascular surgery	SURVASC
	Thoracic surgery	SURTHO
	Neurosurgery	SURNEU
	Transplantation surgery	SURTRANS
	Surgery for cancer	SURONCO
	ENT	SURENT
	Ophthalmology	SUROPH
	Maxillo facial surgery	SURMAXFAC
	Burns care	SURBURN
	Urology	SURURO
	Plastic and reconstructive surgery	SURPLAS
	Other surgery specialty not elsewhere classified	SUROTH
MED - MEDICAL SPECIALTIES	General medicine	MEDGEN
	Gastroenterology	MEDGAST
	Hepatology	MEDHEP
	Endocrinology	MEDENDO
	Oncology	MEDONCO
	Haematology (looks after haematology patients only)	MEDHEMA
	Bone Marrow Transplantation (BMT) (looks after BMT/HSCT patients only)	MEDBMT
	Haematology/BMT (mixed ward looking after both haematology and BMT/HSCT patients)	MEDHEMBMT
	Cardiology	MEDCARD
	Dermatology	MEDDERM
	Nephrology	MEDNEPH
	Neurology	MEDNEU
	Respiratory	MEDPNEU
	Rheumatology	MEDRHEU
	Infectious diseases	MEDID

Ward specialty codes	Consultant specialty name	Consultant specialty code
GER - GERIATRICS	Geriatrics/care of the elderly	GER
	Other medical specialty not listed above	MEDOTH
PED -PAEDIATRICS	Paediatrics general, not specialised	PEDGEN
	Paediatric general surgery	SURPED
	Paediatric ICU	ICUPED
NEO - NEONATOLOGY	Neonatology (excluding healthy neonates)	PEDNEO
	Healthy neonates (paediatrics)	PEDBAB
	Neonatal ICU	ICUNEO
ICU - ADULT INTENSIVE CARE	Adult Mixed ICU; general intensive or critical care/Intensive care medicine	ICUMIX
GO - GYNAECOLOGY/OBSTETRICS	Obstetrics / Maternity	GOOBS
	Gynaecology	GOGYN
	Healthy neonates (maternity)	GOBAB
PSY - PSYCHIATRY	Psychiatry	PSY
RHB - REHABILITATION	Rehabilitation Medicine	RHB
Mixed combination of specialties		MIX
OTH- OTHERS	Others not elsewhere classified and not categorised as 'surgical other' or 'medical other'	OTH

Patient and HAI sections - surgical procedures/SSI Sites

Surgical Category	Surgical Procedure	Description
Cardiac	Cardiac-Cardiac surgery	Procedures on the valves or septum of the heart **excludes coronary artery bypass graft, surgery on vessels, heart transplantation or pacemaker transplantation.
	Cardiac-Coronary artery bypass graft with **both** chest and donor site incisions.	Chest procedure to perform direct revascularization of the heart; includes obtaining suitable vein from donor site for grafting.
	Cardiac-Coronary artery bypass graft with chest incision only	Chest procedure to perform direct revascularization of the heart using, for example the internal mammary (thoracic) artery.
	Cardiac-Heart transplant	Transplantation of heart
	Cardiac-Pacemaker surgery	Insertion, manipulation or replacement of permanent pacemaker or implantable cardiac device (ICD) **includes insertion/replacement of leads **Excludes insertion of temporary transvenous pacemaker system.
ENT	ENT/Neck Surgery	Major excision or incision of the larynx and radical neck dissection Maxillofacial surgery **Excludes thyroid and parathyroid operations - see thyroid or parathyroid surgery
	Tonsillectomy-Min Inv	Surgical removal of tonsils
	Ear Surgery-Min Inv	Operations on the ear
Ophthalmology	Eye surgery-Min Inv	Operations on the eye

Surgical Category	Surgical Procedure	Description
General	General-Abdominal Surgery	Abdominal operations not involving the gastrointestinal tract or biliary system – Can include exploratory laparotomy here if unable to categorise otherwise
	General-Appendix Surgery	All operations of the appendix (not incidental to another procedure) **includes laparoscopic appendectomy
	General-Bile duct- liver or pancreatic surgery	Excision of bile ducts or operative procedures on the biliary tract, liver or pancreas **Excludes operations only on gallbladder (See Gallbladder Surgery)
	General-Breast Surgery	Excision of lesion or tissue of breast including radical, modified, or quadrant resection, lumpectomy, incisional biopsy or mammoplasty.
	General-Colon surgery	Incision, resection or anastomosis of the large intestine **Includes large-to-small and small-to-large bowel anastomosis **Excludes rectal operations
	General-Gallbladder Surgery	Cholecystectomy and cholecystotomy
	General-Gastric Surgery	Incision or excision of stomach; includes subtotal or total gastrectomy **Excludes vagotomy and fundoplication which should be recorded as minimally invasive (unless open)
	General-Herniorrhaphy	Repair of inguinal, femoral, umbilical, or anterior abdominal wall hernia; **Excludes repair of diaphragmatic or hiatal hernia or hernias at other body sites (See Thoracic Surgery)
	General-Liver Transplant	Transplantation of liver
	General-Rectal Surgery	Operations on the rectum
	General-Small bowel surgery	Incision or resection of the small intestine **Excludes small-to-large bowel anastomosis (See colon surgery)
	General-Spleen Surgery	Resection or manipulation of spleen
	General-Thyroid and/or parathyroid surgery	Resection or manipulation of thyroid and/or parathyroid
	Laparoscopic surgery-Min Inv	Any surgery involving use of laparoscope Laparoscopic hysterectomy may be coded under 'vaginal or laparoscopic hysterectomy'
	Incision & drainage of abscess-Min Inv	Incision and drainage of an abscess at a superficial site
Neurosurgery	Neurosurgery-Ventricular shunt	Ventricular shunt operations, including revision and removal of shunt
	Neurosurgery-Craniotomy	Incision through the skull to excise, repair or explore the brain; does not include taps or punctures
	External ventricular drain-Min	Placement of external ventricular drain

Surgical Category	Surgical Procedure	Description
Obstetrics and Gynaecology	Obstetrics and Gynae-Abdominal hysterectomy	Removal of uterus through an abdominal incision **Excludes Vaginal Hysterectomy
	Obstetrics and Gynae-Caesarean Section	Obstetrical delivery by Caesarean section
	Obstetrics and Gynae-Ovarian Surgery	Operations on ovary and related structures
	Obstetrics and Gynae-Vascular-Obstetrics and Gynae-Vaginal hysterectomy	Removal of the uterus through vaginal or perineal incision
	Lapsroscopic hysterectomy-Min Inv	Any surgery involving use of laparoscope Laparoscopic hysterectomy may be coded under 'vaginal or laparoscopic hysterectomy'
	Transvaginal gynaecological or obstetric procedures-Min Inv	Hysteroscopy + procedure Evacuation of retained products of conception
Ortho-Orthopaedics	Ortho-Hip prosthesis	Arthroplasty of hip includes total, partial and revisions
	Ortho-Knee prosthesis	Arthroplasty of knee includes total, partial and revisions
	Ortho-Laminectomy	Exploration or decompression of spinal cord through excision or incision into vertebral structures
	Ortho-Open reduction of fracture	Open reduction of fracture or dislocation of long bones that requires internal or external fixation **Excludes placement of joint prosthesis (see Hip and Knee Prosthesis) **Excludes closed application of external fixator which should be recorded as minimally invasive
	Ortho-Upper limb surgery excl open reduction # long bones	Operations on the upper limb (hand, arm, shoulder) including joint prosthesis **excluding hip/knee prosthesis **excluding Open reduction of fracture or dislocation of long bones
	Ortho-Refusion of spine	Refusion of spine
	Ortho-Spinal Fusion	Immobilisation of spinal column **Excludes refusion of spine
	Arthroscopy or laparoscopic approach-Min Inv	Exploration of joint using arthroscopy
	Application of Ilizarov-Min Inv	External fracture fixation device application
Thoracic	Thoracic Surgery	Noncardiac, nonvascular thoracic surgery **includes pneumonectomy and diaphragmatic or hiatal hernia repair.
Urology	Urology-Kidney Surgery	Resection or manipulation of the kidney with or without removal of related structures **excludes kidney transplant
	Urology-Kidney Transplant	Transplantation of kidney
	Urology-Prostate Surgery	Suprapubic, retropubic, radical or perineal excision of the prostate
	Urology-bladder surgery	Operations on the bladder

	Transurethral resection of prostate-Min Inv	Transurethral resection of the prostate (TURP)
Vascular	Vascular-Abdominal aortic aneurysm repair	Resection of abdominal aorta with anastomosis or replacement
	Vascular-Carotid endarterectomy	Endarterectomy on vessels of head and neck (includes carotid artery and jugular vein)
	Vascular-Limb amputation	Total or partial amputation or disarticulation of the upper or lower limbs, including digits **Excludes amputation with healing by secondary intention which should be recorded as minimally invasive
	Vascular-Peripheral vascular bypass surgery	Bypass operations on peripheral arteries
	Vascular-Shunt for dialysis	Arteriovenostomy for renal dialysis (Surgery to create an AV fistula or graft for haemodialysis)
Other non NHSN procedure	Procedure not classified as NHSN (inc. eyes-ears-throat-bladder)	
	Minimally Invasive surgery	

HAI Infection: case definition codes

(See *Appendix B for a detailed description of each HAI case definition)*

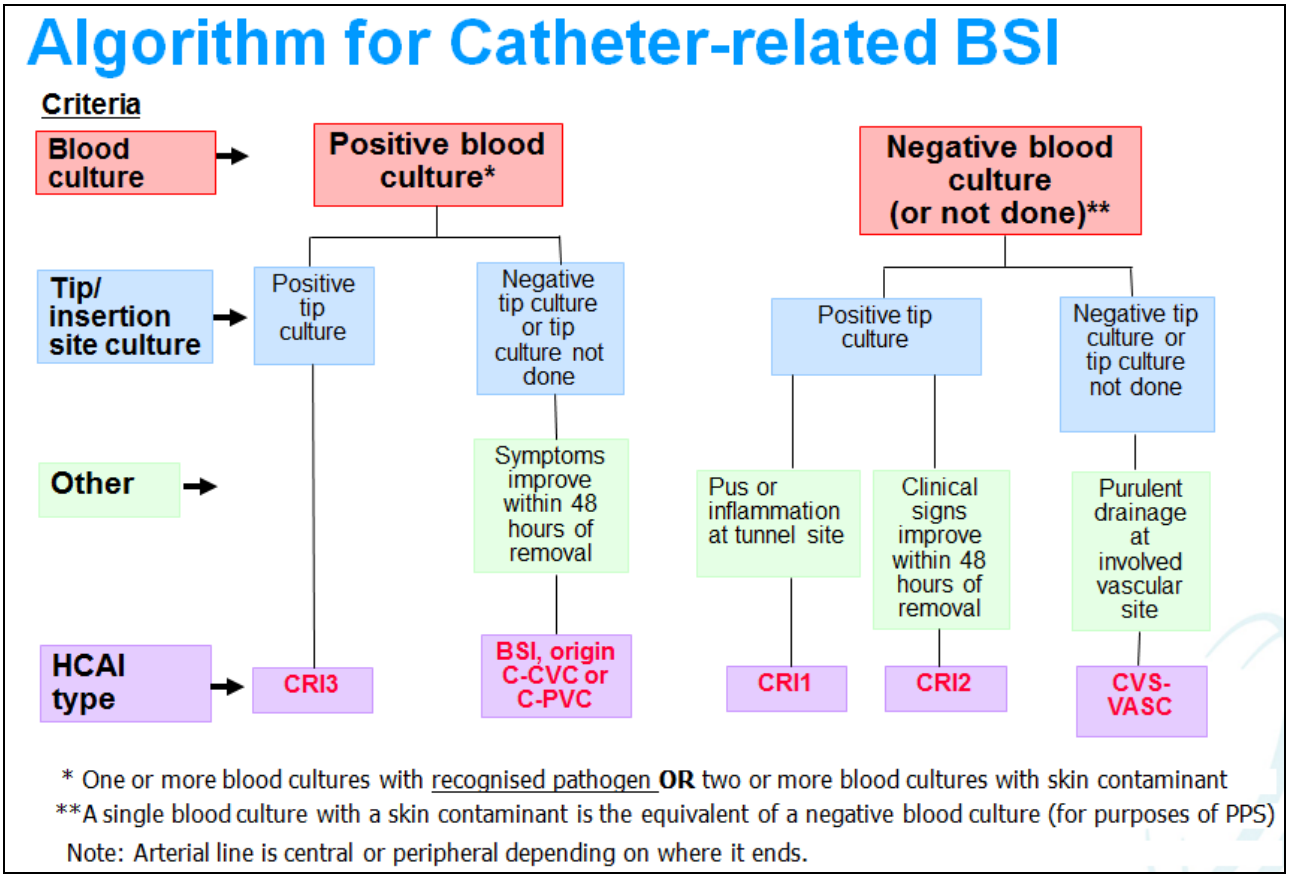
HAI case definition codes are recorded on Form C - 'HAI definitions' – Always check Appendix B (page 24-46) for a detailed description of each HAI case definition when deciding if patient meets HAI case definition

SSI		**Surgical site infection**
	SSI-S	Superficial incisional
	SSI-D	Deep incisional
	SSI-O	Organ/space
PN		**Pneumonia**
	PN1	Positive quantitative culture from minimally contaminated lower respiratory tract specimen
	PN2	Positive quantitative culture from possibly contaminated lower respiratory tract specimen
	PN3	Microbiological diagnosis by alternative microbiology methods
	PN4	Positive sputum culture or non-quantitative culture from lower respiratory tract specimen
	PN5	Clinical signs of pneumonia without positive microbiology
LRI		**Lower respiratory tract infection, other than pneumonia**
	BRON	Bronchitis, tracheobronchitis, bronchiolitis, tracheitis, without evidence of pneumonia
	LUNG	Other infections of the lower respiratory tract
UTI		**Urinary tract infection**
	UTI-A	Microbiologically confirmed symptomatic UTI
	UTI-B	Not microbiologically confirmed symptomatic UTI
BSI		**Bloodstream infection (laboratory-confirmed)**
	Source of BSI:	
	C-CVC	Central vascular catheter (note: report as CRI3 if microbiological criteria are met)
	C-PVC	Peripheral vascular catheter
	S-PUL	Secondary to pulmonary infection
	S-UTI	Secondary to urinary tract infection
	S-DIG	Secondary to digestive tract infection
	S-SSI	Secondary to surgical site infection
	S-SST	Secondary to skin and soft tissue infection
	S-OTH	Secondary to another infection
	UO	BSI of (confirmed) unknown origin
	UNK	No information/truly unknown
CRI-CVC		**Central vascular catheter-related infection**
	CRI1-CVC	Local CVC-related infection (no positive blood culture)
	CRI2-CVC	General CVC-related infection (no positive blood culture)
	CRI3-CVC	Microbiologically confirmed CVC-related BSI
CRI-PVC		**Peripheral vascular catheter-related infection**
	CRI1-PVC	Local PVC-related infection (no positive blood culture)
	CRI2-PVC	General CRI (no positive blood culture)
	CRI3-PVC	Microbiologically confirmed PVC-related BSI
SST		**Skin and soft tissue infections**
	SKIN	Skin
	ST	Soft tissue (necrotising fascitis, infectious gangrene, necrotizing cellulitis, infectious myositis, lymphadenitis, or lymphangitis)
	DECU	Decubitus ulcer or pressure sore, including both superficial and deep infections
	BURN	Burn

	BRST	Breast abscess or mastitis
BJ		**Bone and joint infection**
	BONE	Osteomyelitis
	JNT	Joint or bursa
	DISC	Disc space infection
GI		**Gastrointestinal system infections**
	CDI	*Clostridium difficile* infection
	GE	Gastroenteritis (excluding CDI)
	GIT	Gastrointestinal tract (oesophagus, stomach, small and large bowel, and rectum), excluding GE, CDI
	HEP	Hepatitis
	IAB	Intra-abdominal, not specified elsewhere
CVS		**Cardiovascular system infection**
	VASC	Arterial or venous infection
	ENDO	Endocarditis
	CARD	Myocarditis or pericarditis
	MED	Mediastinitis
CNS		**Central nervous system infection**
	IC	Intracranial infection
	MEN	Meningitis or ventriculitis
	SA	Spinal abscess without meningitis
EENT		**Eye, ear, nose or mouth infection**
	CONJ	Conjunctivitis
	EYE	Eye, other than conjunctivitis
	EAR	Ear mastoid
	ORAL	Oral cavity (mouth, tongue, or gums)
	SINU	Sinusitis
	UR	Upper respiratory tract, pharyngitis, laryngitis, epiglottitis
REPR		**Reproductive tract infections**
	EMET	Endometritis
	EPIS	Episiotomy
	VCUF	Vaginal cuff
	OREP	Other infections of the male or female reproductive tract
SYS		**Systemic infections**
	DI	Disseminated infection
	CSEP	Treated unidentified severe infection in adults and children
NEO		**CASE DEFINITIONS FOR NEONATES**
	CSEP	Clinical sepsis in neonates
	LCBI	Laboratory-confirmed bloodstream infection in neonates, non-coagulase-negative staphylococci
	CNSB	Laboratory-confirmed bloodstream infection with coagulase-negative staphylococci in neonates
	PNEU	Pneumonia in neonates
	NEC	Necrotising enterocolitis

HAI: Bloodstream Infection (BSI) Source Codes & Algorithm

Primary BSI: Catheter related = BSI due to infection of either a peripheral vascular catheter (PVC) or central vascular catheter (CVC)	
C-CVC	Central vascular catheter infection: Clinical relationship (e.g. symptoms improve within 48 hours after catheter removal): No positive microbiology linking the positive blood culture with the central vascular catheter (tip/exit site swab)
C-PVC	Peripheral vascular catheter infection: Clinical relationship (e.g. symptoms improve within 48 hours after catheter removal). No positive microbiology linking the positive blood culture with the peripheral vascular catheter (tip/exit site swab)
CRI3-CVC	Central vascular catheter infection: Microbiologically confirmed. The same organism isolated from both blood cultures and central vascular catheter (tip/exit site swab)
CRI3-PVC	Peripheral vascular catheter infection: Microbiologically confirmed. The same organism isolated from both blood cultures and peripheral vascular catheter (tip/exit site swab)
Primary BSI: Unknown origin	
UO	Primary BSI of unknown origin – not related to infection of vascular catheter and not secondary to infection elsewhere as described below
Secondary BSI: BSI arising secondary to infection elsewhere	
S-PUL	Pulmonary infection
S-UTI	Urinary tract Infection
S-SSI	Surgical Site Infection
S-DIG	Digestive tract infection
S-SST	Skin soft tissue
S-OTH	Other infection (e.g. meningitis, osteomyelitis etc)
BSI Source Unknown: No information available or information is missing	
UNK	BSI source is unknown as no information available or information missing



HAI: Microorganism Codes

Microorganisms highlighted in grey and coded in red correspond to microorganisms for which a resistance phenotype should also be recorded (See Form C - HAI: Resistance)

Family	Microorganism	MO-code
Gram-positive cocci	*Staphylococcus aureus*	STAAUR
	Staphylococcus epidermidis	STAEPI
	Staphylococcus haemolyticus	STAHAE
	Coagulase negative staphylococci, not specified to species level	STACNS
	Other coagulase-negative staphylococci specified to species level (CoNS)	STAOTH
	Staphylococcus spp., *not specified as Staphylococcus aureus or CoNS*	STANSP
	Streptococcus pneumoniae or pneumococcus	STRPNE
	Streptococcus agalactiae or Group B streptococcus	STRAGA
	Streptococcus pyogenes or Group A streptococcus	STRPYO
	Other beta haemolytic streptococci – Group C or Group G streptococcus	STRHCG
	Streptococcus spp. specified *(Other than Streptococcus pneumoniae or Group A,B,C,G)*	STROTH
	Streptococcus spp., *not specified*	STRNSP
	Enterococcus faecalis	ENCFAE
	Enterococcus faecium	ENCFAI
	Enterococcus spp., other	ENCOTH
	Enterococcus spp., not specified	ENCNSP
	Gram-positive cocci, not specified	GPCNSP
	Other Gram-positive cocci specified	GPCOTH
Gram-negative cocci	*Moraxella catarralis*	MORCAT
	Moraxella spp., *other*	MOROTH
	Moraxella spp., *not specified*	MORNSP
	Neisseria meningitidis	NEIMEN
	Neisseria spp., *other specified*	NEIOTH
	Neisseria spp., *not specified*	NEINSP
	Gram-negative cocci, not specified	GNCNSP
	Other Gram-negative cocci	GNCOTH
Gram-positive bacilli	*Corynebacterium spp.*	CORSPP
	Bacillus spp.	BACSPP
	Lactobacillus spp.	LACSPP
	Listeria monocytogenes	LISMON
	Gram-positive bacilli, not specified	GPBNSP
	Other Gram-positive bacilli	GPBOTH
***Enterobacteriaceae* Gram-negative bacilli**	*Citrobacter freundii*	CITFRE
	Citrobacter koseri (e.g. *diversus*)	CITDIV
	Citrobacter spp., other	CITOTH
	Citrobacter spp., not specified	CITNSP

Family	Microorganism	MO-code
	Enterobacter cloacae	ENBCLO
	Enterobacter aerogenes	ENBAER
	Enterobacter agglomerans	ENBAGG
	Enterobacter sakazakii	ENBSAK
	Enterobacter gergoviae	ENBGER
	Enterobacter spp., other	ENBOTH
	Enterobacter spp., not specified	ENBNSP
	Escherichia coli	ESCCOL
	Klebsiella pneumoniae	KLEPNE
	Klebsiella oxytoca	KLEOXY
	Klebsiella spp., other	KLEOTH
	Klebsiella spp., not specified	KLENSP
	Proteus mirabilis	PRTMIR
	Proteus vulgaris	PRTVUL
	Proteus spp., other	PRTOTH
	Proteus spp., not specified	PRTNSP
	Serratia marcescens	SERMAR
	Serratia liquefaciens	SERLIQ
	Serratia spp., other	SEROTH
	Serratia spp., not specified	SERNSP
	Hafnia spp.	HAFSPP
	Morganella spp.	MOGSPP
	Providencia spp.	PRVSPP
	Salmonella enteritidis	SALENT
	Salmonella typhi or *paratyphi*	SALTYP
	Salmonella typhimurium	SALTYM
	Salmonella spp., not specified	SALNSP
	Salmonella spp., other	SALOTH
	Shigella spp.	SHISPP
	Yersinia spp.	YERSPP
	Other *Enterobacteriaceae, specified*	ETBOTH
	Enterobacteriaceae, not specified	ETBNSP
Other Gram-negative bacilli	*Acinetobacter baumannii*	ACIBAU
	Acinetobacter calcoaceticus	ACICAL
	Acinetobacter haemolyticus	ACIHAE
	Acinetobacter lwoffii	ACILWO
	Acinetobacter spp., other	ACIOTH
	Acinetobacter spp., not specified	ACINSP
	Pseudomonas aeruginosa	PSEAER
	Stenotrophomonas maltophilia	STEMAL
	Burkholderia cepacia	BURCEP
	Pseudomonadaceae family, other	PSEOTH
	Pseudomonadaceae family, not specified	PSENSP
	Haemophilus influenzae	HAEINF
	Haemophilus parainfluenzae	HAEPAI
	Haemophilus spp., other	HAEOTH
	Haemophilus spp., not specified	HAENSP
	Legionella spp.	LEGSPP
	Achromobacter spp.	ACHSPP
	Aeromonas spp.	AEMSPP

Family	Microorganism	MO-code
	Agrobacterium spp.	AGRSPP
	Alcaligenes spp.	ALCSPP
	Campylobacter spp.	CAMSPP
	Flavobacterium spp.	FLASPP
	Gardnerella spp.	GARSPP
	Helicobacter pylori	HELPYL
	Pasteurella spp.	PASSPP
	Gram-negative bacilli, not specified	GNBNSP
	Other Gram-negative bacilli, specified and non-*Enterobacteriaceae*	GNBOTH
Anaerobic bacilli	*Bacteroides fragilis*	BATFRA
	Bacteroides other	BATOTH
	Clostridium difficile	CLODIF
	Clostridium spp. other	CLOOTH
	Propionibacterium spp.	PROSPP
	Prevotella spp.	PRESPP
	Anaerobes, not specified	ANANSP
	Other anaerobes specified	ANAOTH
Other bacteria	Mycobacterium, atypical/non-tuberculous	MYCATY
	Mycobacterium tuberculosis complex **TB is not reported in the PPS – Do not report *M. tuberculosis* complex or antimicrobial treatment for suspected or confirmed active or latent *M. tuberculosis* complex infection**	MYCTUB
	Chlamydia spp.	CHLSPP
	Mycoplasma spp.	MYPSPP
	Actinomyces spp.	ACTSPP
	Nocardia spp.	NOCSPP
	Other bacteria	BCTOTH
Fungi	*Candida albicans*	CANALB
	Candida glabrata	CANGLA
	Candida krusei	CANKRU
	Candida parapsilosis	CANPAR
	Candida tropicalis	CANTRO
	Candida spp., other specified	CANOTH
	Candida spp., not specified	CANNSP
	Aspergillus fumigatus	ASPFUM
	Aspergillus niger	ASPNIG
	Aspergillus spp., other specified	ASPOTH
	Aspergillus spp., not specified	ASPNSP
	Other yeasts	YEAOTH
	Fungi other	FUNOTH
	Filaments other	FILOTH
	Other parasites	PAROTH
Virus	Adenovirus	VIRADV
	Cytomegalovirus (CMV)	VIRCMV
	Enterovirus (polio, coxsackie, echo)	VIRENT
	Hepatitis A virus	VIRHAV
	Hepatitis B virus	VIRHBV
	Hepatitis C virus	VIRHCV
	Herpes simplex virus	VIRHSV
	Human immunodeficiency virus (HIV)	VIRHIV

Family	Microorganism	MO-code
	Influenza A virus	VIRINA
	Influenza B virus	VIRINB
	Influenza C virus	VIRINC
	Norovirus	VIRNOR
	Parainfluenza virus	VIRPIV
	Respiratory syncytial virus (RSV)	VIRRSV
	Rhinovirus	VIRRHI
	Rotavirus	VIRROT
	SARS virus	VIRSAR
	Varicella-zoster virus	VIRVZV
	Virus, not specified	VIRNSP
	Other virus	VIROTH
Micro-organism not identified		NONID
Examination not done		NOEXA
Sterile examination		STERI
Result not (yet) available or missing		NA

HAI: Resistance codes

Resistance phenotype –For each microorganism shaded in grey in Form C - HAI: Microorganism Code, specify the relevant antimicrobial resistance marker in the column titled 'Resistance Code'. The antimicrobial resistance markers are:

- S = Sensitive
- I = Intermediate
- R = Resistant
- U = UNK, Unknown antimicrobial susceptibility test results for that micro-organism

Organism identification (MO-code)	*Sensitivity outcome*		*Code*
Staphylococcus aureus **(STAAUR)** Flucloxacillin Glycopeptide (vancomycin, teicoplanin)	Flucloxacillin sensitive (S) MSSA	Glycopeptide (S)	FS-GS
	Flucloxacillin sensitive (S) MSSA	Glycopeptide (I) GISA	FS-GI
	Flucloxacillin sensitive (S) MSSA	Glycopeptide (R) GRSA/VRSA	FS-GR
	Flucloxacillin sensitive (S) MSSA	Glycopeptide (Unk)	FS-GU
	Flucloxacillin resistant (R) MRSA	Glycopeptide (S)	FR-GS
	Flucloxacillin resistant (R) MRSA	Glycopeptide (I) GISA	FR-GI
	Flucloxacillin resistant (R) MRSA	Glycopeptide (R) GRSA/VRSA	FR-GR
	Flucloxacillin resistant (R) MRSA	Glycopeptide (Unk)	FR-GU
	Flucloxacillin (Unk)	Glycopeptide (S)	FU-GS
	Flucloxacillin (Unk)	Glycopeptide (I) GISA	FU-GI
	Flucloxacillin (Unk)	Glycopeptide (R) GRSA/VRSA	FU-GR
	Flucloxacillin (Unk)	Glycopeptide (Unk)	FU-GU
Enterococcus **(ENCFAE, ENCFAI, ENCOTH, ENCNSP)** Glycopeptide (vancomycin, teicoplanin)	Glycopeptide sensitive (S) VSE		GS
	Glycopeptide resistant (R) VRE		GR
	Glycopeptide (Unk)		GU
Enterobacteriaceae **All organisms listed in the table under Gram-negative bacilli** ***Enterobacteriaceae*** Third generation cephalosporin(C3G) (cefotaxime, ceftriaxone, ceftazidime) Carbapenem (meropenem, ertapenem)	C3G (S)	Carbapenem (S)	C3GS-CS
	C3G (S)	Carbapenem (I)	C3GS-CI
	C3G (S)	Carbapenem (R) CRE/CPE	C3GS-CR
	C3G (S)	Carbapenem (U)	C3GS-CU
	C3G (I)	Carbapenem (S)	C3GI-CS
	C3G (I)	Carbapenem (I)	C3GI-CI
	C3G (I)	Carbapenem (R) CRE/CPE	C3GI-CR
	C3G (I)	Carbapenem (U)	C3GI-CU
	C3G (R)	Carbapenem (S)	C3GR-CS
	C3G (R)	Carbapenem (I)	C3GR-CI
	C3G (R)	Carbapenem (R) CRE/CPE	C3GR-CR
	C3G (R)	Carbapenem (U)	C3GR-CU
	C3G (Unk)	Carbapenem (S)	C3GU-CS
	C3G (Unk)	Carbapenem (I)	C3GU-CI

	C3G (Unk)	Carbapenem (R)	C3GU-CR
	C3G (Unk)	Carbapenem (U)	C3GU-CU
Acinetobacter baumannii **(ACIBAU)** Carbapenem (meropenem, ertapenem)	Carbapenem (S)		CS
	Carbapenem (I)		CI
	Carbapenem (R)		CR
	Carbapenem (U)		CU
Pseudomonas aeruginosa **(PSEAUR)** Carbapenem (meropenem, ertapenem)	Carbapenem (S)		CS
	Carbapenem (I)		CI
	Carbapenem (R)		CR
	Carbapenem (S)		CU

If a microorganism is tested against more than one antimicrobial in the same class, with different results, assign the priority code to the more resistant antimicrobial **R>I>S**

e.g., *E. cloacae* resistant to ertapenem = R, meropenem = S

=> Record *E. cloacae* as carbapenem = R

Third generation cephalosporins (C3) – cefotaxime, ceftriaxone, ceftazidime, cefpodoxime

Carbapenems (Car) - meropenem, ertapenem, imipenem, doripenem

AMU: Antimicrobial use - ATC5 Code List

List of the most commonly prescribed antimicrobials, in order of frequency

Antimicrobial generic name	ATC5
Amoxicillin and enzyme inhibitor – co-amoxiclav	J01CR02
Piperacillin and enzyme inhibitor – piperacillin-tazobactam	J01CR05
Metronidazole (oral, rectal)	P01AB01
Metronidazole (parenteral/IV)	J01XD01
Flucloxacillin	J01CF05
Ciprofloxacin	J01MA02
Cefuroxime	J01DC02
Clarithromycin	J01FA09
Vancomycin parenteral (IV)	J01XA01
Vancomycin enteral (oral) [Treatment of *C. difficile* infection only]	A07AA09
Gentamicin	J01GB03
Benzylpenicillin	J01CE01
Meropenem	J01DH02
Amikacin	J01GB06
Amoxicillin	J01CA04
Azithromycin	J01FA10
Sulfamethoxazole and trimethoprim (co-trimoxazole)	J01EE01
Teicoplanin	J01XA02

All antimicrobials (outside of most commonly prescribed) in alphabetical order

Antimicrobial generic name-ATC5	
Amikacin	J01GB06
Amoxicillin	J01CA04
Amoxicillin and enzyme inhibitor co_amoxiclav	J01CR02
Amphotericin B (oral)	A07AA07
Amphotericin B (parenteral)	J02AA01
Ampicillin	J01CA01
Ampicillin and enzyme inhibitor	J01CR01
Ampicillin combinations	J01CA51
Anidulafungin	J02AX06
Aspoxicillin	J01CA19
Azithromycin	J01FA10
Aztreonam	J01DF01
Bacitracin	J01XX10
Benzathine benzylpenicillin	J01CE08
Benzylpenicillin	J01CE01
Caspofungin	J02AX04
Cefaclor	J01DC04
Cefadroxil	J01DB05
Cefalexin	J01DB01
Cefazolin	J01DB04

Cefixime	J01DD08
Cefotaxime	J01DD01
Cefpodoxime	J01DD13
Cefradine	J01DB09
Ceftazidime	J01DD02
Ceftriaxone	J01DD04
Ceftriaxone combinations	J01DD54
Cefuroxime	J01DC02
Cefuroxime combinations with other antibacterials	J01RA03
Chloramphenicol	J01BA01
Ciprofloxacin	J01MA02
Clarithromycin	J01FA09
Clindamycin	J01FF01
Colistin (injection_infusion)	J01XB01
Colistin (oral)	A07AA10
Combinations of beta_lactamase sensitive penicillins	J01CE30
Combinations of intermediate acting sulfonamides	J01EC20
Combinations of long acting sulfonamides	J01ED20
Combinations of penicillins	J01CR50
Combinations of penicillins with extended spectrum	J01CA20
Combinations of short acting sulfonamides	J01EB20
Combinations of tetracyclines	J01AA20
Daptomycin	J01XX09
Demeclocycline	J01AA01
Doripenem	J01DH04
Doxycycline	J01AA02
Ertapenem	J01DH03
Erythromycin	J01FA01
Ethambutol	J04AK02
Fidaxomicin	A07AA12
Flucloxacillin	J01CF05
Fluconazole	J02AC01
Flucytosine	J02AX01
Fosfomycin	J01XX01
Fusidic acid	J01XC01
Gentamicin	J01GB03
Griseofulvin	D01BA01
Imipenem and enzyme inhibitor	J01DH51
Isavuconazole	J02AC05
Isoniazid	J04AC01
Itraconazole	J02AC02
Ketoconazole	J02AB02
Levofloxacin	J01MA12
Linezolid	J01XX08
Lymecycline	J01AA04
Mecillinam	J01CA11
Meropenem	J01DH02
Methenamine	J01XX05
Meticillin	J01CF03

Metronidazole (oral_rectal)	P01AB01
Metronidazole (parenteral)	J01XD01
Micafungin	J02AX05
Miconazole	J02AB01
Minocycline	J01AA08
Moxifloxacin	J01MA14
Nalidixic acid	J01MB02
Neomycin (injection infusion)	J01GB05
Neomycin (oral)	A07AA01
Neomycin combinations (oral)	A07AA51
Nitrofurantoin	J01XE01
Nitroxoline	J01XX07
Norfloxacin	J01MA06
Nystatin	A07AA02
Ofloxacin	J01MA01
Oxytetracycline	J01AA06
Oxytetracycline, combinations	J01AA56
Paromomycin	A07AA06
Penicillins combinations with other antibacterials	J01RA01
Phenoxymethylpenicillin	J01CE02
Piperacillin	J01CA12
Piperacillin and enzyme inhibitor piperacillin_tazobactam	J01CR05
Pivmecillinam	J01CA08
Polymyxin B enteral	A07AA05
Polymyxin B parenteral	J01XB02
Posaconazole	J02AC04
Procaine benzylpenicillin	J01CE09
Pyrazinamide	J04AK01
Rifampicin	J04AB02
Rifaximin	A07AA11
Spiramycin	J01FA02
Spiramycin combinations with other antibacterials	J01RA04
Streptomycin (oral)	A07AA04
Streptomycin (parenteral)	J01GA01
Streptomycin combinations	A07AA54
Sulfadiazine	J01EC02
Sulfadiazine and trimethoprim	J01EE02
Sulfamethizole	J01EB02
Sulfamethoxazole	J01EC01
Sulfamethoxazole and trimethoprim (co_trimoxazole)	J01EE01
Sulfonamides combinations with other antibacterials (ex. trimethoprim)	J01RA02
Tazobactam	J01CG02
Tedizolid	J01XX11
Teicoplanin	J01XA02
Telithromycin	J01FA15
Temocillin	J01CA17
Terbinafine	D01BA02
Tetracycline	J01AA07

Ticarcillin	J01CA13
Ticarcillin and enzyme inhibitor	J01CR03
Tigecycline	J01AA12
Tinidazole (oral, rectal)	P01AB02
Tinidazole (parenteral)	J01XD02
Tobramycin	J01GB01
Trimethoprim	J01EA01
Vancomycin (parenteral)	J01XA01
Vancomycin enteral (oral) [Treatment of C. difficile infection only]	A07AA09
Voriconazole	J02AC03

AMU: Antimicrobial use - Diagnosis Site Code

Code	Clinician's diagnosis of the site of infection for which the patient receives antimicrobial therapy
CNS	Central nervous system infection (e.g., meningitis, brain abscess)
EYE	Endophthalmitis
ENT	Infections of ear, nose, throat, larynx and mouth
BRON	Acute bronchitis or exacerbations of chronic bronchitis
PNEU	Pneumonia
CF	Cystic fibrosis infective exacerbation
CVS	Cardiovascular infection (e.g., endocarditis, vascular graft infection)
GI	Gastrointestinal infections (e.g., salmonellosis, *C. difficile* infection)
IA	Intraabdominal infection, including hepatobiliary
SST-SSI	Surgical site infection involving skin or soft tissue, but not bone
SST-O	Skin soft tissue infection, includes cellulitis, wound infection and deep soft tissue infection, not involving bone AND not related to surgery
BJ-SSI	Septic arthritis, osteomyelitis related to surgery at site of infection, includes prosthetic joint infection
BJ-O	Septic arthritis, osteomyelitis not related to surgery
CYS	Cystitis or symptomatic lower urinary tract infection
PYE	Pyelonephritis or symptomatic upper urinary tract infection
ASB	Asymptomatic bacteriuria – positive urine microbiology results in the absence of signs of urinary tract infection
OBGY	Obstetric or gynaecological infections, includes sexually transmitted infection (STI) in women
GUM	Prostatitis, epididymoorchitis, includes sexually transmitted infection (STI) in men
BAC	Laboratory-confirmed clinically-significant positive blood cultures (bacteraemia or bloodstream infection)
CSEP	Clinical sepsis (suspected bloodstream infection without laboratory confirmation of positive blood cultures OR results not yet available OR blood cultures have not been collected OR laboratory has confirmed that blood cultures are negative after five days incubation) Note CSEP excludes patients with febrile neutropenia and infection in immunocompromised hosts
FN	Febrile neutropenia or other form of manifestation of infection without an obvious site in an immunocompromised host (e.g. patient with HIV infection, patient receiving chemotherapy or other immunosuppressive therapy)
SIRS	Systemic inflammatory response with no clear anatomical site
UND	Completely undefined site for infection with no systemic inflammation
NA	Not applicable, indication for antimicrobial use is not for 'treatment intention of infection = CI, LI or HI'

AMU: Antimicrobial use - Indication

Treatment	
CI	Treatment of community-acquired infection (CI)
LI	Treatment of long-term care-acquired infection (LI)
HI	Treatment of hospital-acquired infection (HI)
Prophylaxis	
MP	Medical prophylaxis
SP1	Surgical prophylaxis: single dose
SP2	Surgical prophylaxis: one day
SP3	Surgical prophylaxis: > 1 day
Other	
O	Other reason (e.g. prokinetic erythromicin)
UI	Unknown indication (verified during PPS)
Missing	Missing information (not verified during survey)

Hospital Associated Infection

Appendix B: Case Definitions of Hospital-Acquired Infections (HAI)

The vast majority of HAI will be detected based on the fact that a patient is prescribed antimicrobials. In a small percentage of cases however, the patient may have a HAI which is not treated by an antimicrobial (e.g. viral infection). Therefore other sources should also be consulted: nursing or midwifery staff and clinicians caring for the patient and infection prevention and control staff.

A HAI is **active** when signs and symptoms of the infection **are** present on the survey date or there is documentation that signs and symptoms **were** present in the past and the patient continues to receive antimicrobial therapy for that infection on the survey date. The presence of symptoms and signs should be verified back to the start date of antimicrobial therapy, in order to determine whether the treated infection matches one of the case definitions for a hospital-acquired infection.

Infections originating in healthcare facilities that are not acute hospitals (e.g., long-term care facilities, care homes or nursing homes) should not be included as HAI.

Reporting instructions are coded in red throughout the case definitions.

Onset of HAI		Case Definition
All HAI types *Day 3 onwards*	***AND***	Meets the case definition on the day of survey
OR		
All HAI types *Admission, day 1 or day 2 AND patient discharged from hospital, acute or non-acute, in preceding 48 hours*		
OR		OR
Surgical Site Infection *Admission, day 1 or day 2* *An SSI is defined as any SSI type which occurs within 30 days of infection of the operation date. In the case of surgery involving an implant, deep or organ space SSI arising up to 90 days after surgery is also considered and the patient either has symptoms that meet the case definition and/or is on antimicrobial treatment for infection.*		Patient is receiving antimicrobials **AND** HAI has previously met the case definition between day 1 of antimicrobial treatment and survey day
OR		
***Clostridium difficile* infection** *Admission, day 1 or day 2 AND patient discharged from hospital, acute or non-acute, in preceding 28 days*		
OR		
Device associated infection *Relevant device in situ prior to onset*		
OR		
Neonatal infection *Count any active infection arising after birth while infant remains in hospital*		

Figure: Algorithm to assist with identification of HAI

1.1 PN: Pneumonia

Rx

Two or more serial chest X-rays or CT-scans of lungs with suggestive image of pneumonia for patients with underlying cardiac or pulmonary disease*. In patients without underlying cardiac or pulmonary disease, one definitive chest X-ray or CT-scan is sufficient.

and at least ONE of the following

Symptoms

- Fever > 38 °C with no other cause
- Leukopenia (<4000 WBC/mm^3) or leucocytosis (≥ 12 000 WBC/mm^3)
  and at least ONE of the following
  (or at least TWO if clinical pneumonia only = PN 4 and PN 5)
- New onset of purulent sputum, or change in character of sputum (colour, odour, quantity, consistency)
- Cough or dyspnoea or tachypnoea
- Suggestive auscultation (rales or bronchial breath sounds), rhonchi, wheezing
- Worsening gas exchange (e.g., O_2 desaturation or increased oxygen requirements or increased ventilation demand)
  and according to the used diagnostic method:

Microbiology

a – Bacteriologic diagnostic performed by:

Positive quantitative culture from minimally contaminated lower respiratory tract (LRT) specimen **(PN 1)**

- Bronchoalveolar lavage (BAL) with a threshold of ≥ 10^4 colony-forming units (CFU)/ml or ≥ 5 % of BAL obtained cells contain intracellular bacteria on direct microscopic exam (classified on the diagnostic category BAL).
- Protected brush (PB Wimberley) with a threshold of ≥10^3 CFU/ml
- Distal protected aspirate (DPA) with a threshold of ≥ 10^3 CFU/ml

Positive quantitative culture from possibly contaminated LRT specimen **(PN 2)**

- Quantitative culture of LRT specimen (e.g. endotracheal aspirate) with a threshold of 10^6 CFU/ml

b – Alternative microbiology methods **(PN 3)**

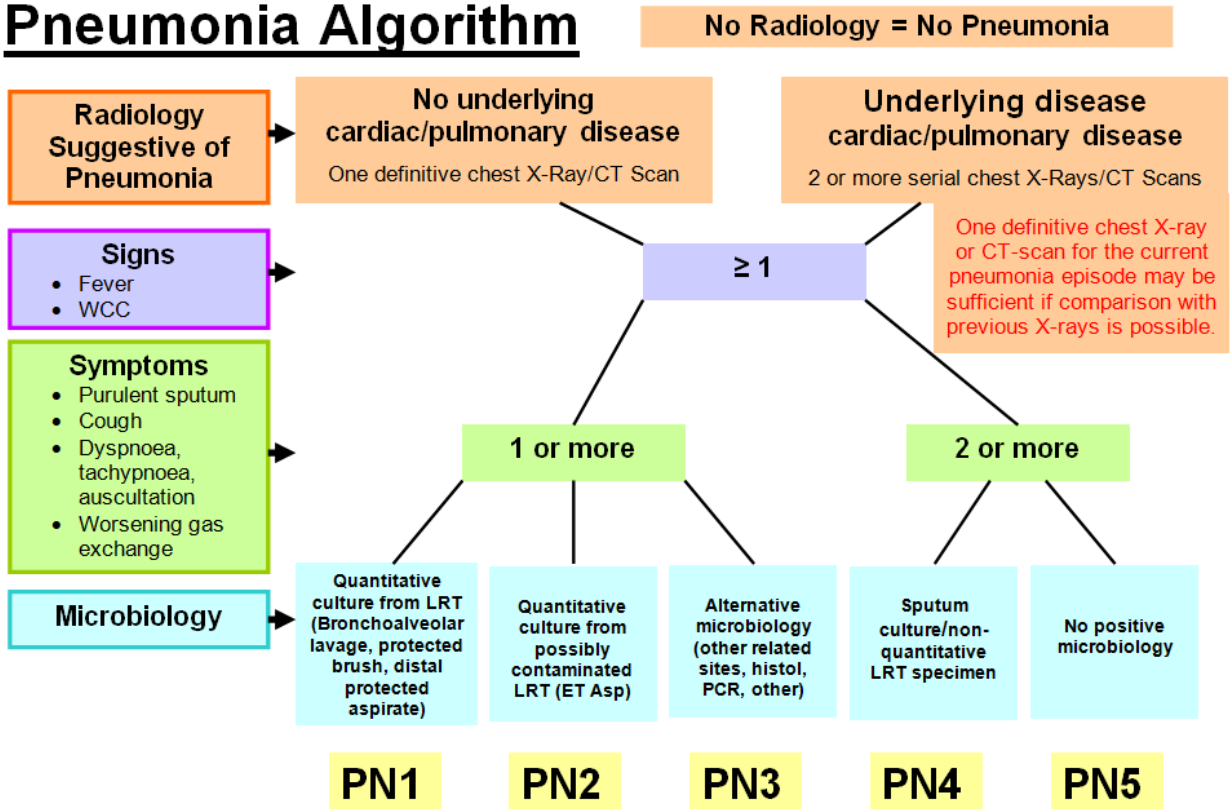
- Positive blood culture not related to another source of infection
- Positive growth in culture of pleural fluid
- Pleural or pulmonary abscess with positive needle aspiration
- Histologic pulmonary exam shows evidence of pneumonia
- Positive exams for pneumonia with virus or particular microorganism detected: *Legionella spp*, *Aspergillus spp*, mycobacteria, *Mycoplasma spp*, *Pneumocystis spp*)
  - Positive detection of viral antigen or antibody from respiratory secretions (e.g. EIA, FAMA, shell vial assay, PCR)
  - Positive direct exam or positive culture from bronchial secretions or tissue
  - Seroconversion (e.g. influenza viruses, *Ligionella, Clamydia*
  - Detection of antigens in urine (*Legionella pneumophila, Streptococcus pneumoniae)*

c – Others

- Positive **sputum** culture **or non-quantitative LRT specimen** culture **(PN 4)**
- **No positive microbiology** **(PN 5)**

PN reporting instruction:

- **For patients with underlying cardiac or pulmonary disease, one definitive CXR or CT scan for the current episode will suffice, provided it may be compared with a previous CXR or CT scan performed within the last 12 months**
- **For pneumonia, only fill one subcategory (where more than one PN definition is met by the patient, prioritise recorded pneumonia definition as: PN1>PN2>PN3>PN4>PN5).**



1.2 LRI: Lower respiratory tract infection, other than Pneumonia

LRI-BRON: Bronchitis, tracheobronchitis, bronchiolitis, tracheitis, without evidence of pneumonia
Tracheobronchial infections must meet the following criteria:

Patient has no clinical or radiographic evidence of pneumonia
AND
Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: fever (>38 C), cough, new or increased sputum production, rhonchi, wheezing **and** at least **ONE** of the following:

a. Positive culture obtained by deep tracheal aspirate or bronchoscopy
b. Positive antigen test on respiratory secretions

LRI-BRON reporting instruction:
Do not report chronic bronchitis in a patient with chronic lung disease as an infection, unless there is evidence of an acute secondary infection, manifested by change in organism.

LRI-LUNG: Other infections of the lower respiratory tract
Other infections of the lower respiratory tract must meet at least **ONE** of the following criteria:

1. Patient has organisms seen on smear or cultured from lung tissue or fluid, including pleural fluid
2. Patient has a lung abscess or empyema seen during a surgical operation or histopathologic examination
3. Patient has an abscess cavity seen on radiographic examination of lung

LRI-Lung reporting instruction:
Report lung abscess or empyema without pneumonia as LRI-LUNG.

LRTI, other than pneumonia

LRI-BRON Bronchitis, tracheobronchitis, bronchiolitis, tracheitis, without evidence of pneumonia	LRI-LUNG Other infections of the lower respiratory tract
NO clinical/radiographic pneumonia **AND** Two or more signs/symptoms: • Fever • Cough • New or increased sputum production • Rhonchi • Wheezing **AND** at least one of the following: • Positive culture obtained by deep tracheal aspirate/bronchoscopy • positive antigen test on respiratory secretions	At least **one** of the following: • Organisms seen on smear or cultured from lung tissue or fluid, including pleural fluid • Lung abscess/ empyema seen at operation/histology • Abscess cavity on radiology

1.3 UTI: Urinary tract infection

UTI-A: microbiologically confirmed symptomatic UTI

Patient has at least **ONE** of the following signs of symptoms with no other recognised cause:

- fever (>38°C),
- urgency,
- frequency,
- dysuria, or suprapubic tenderness

AND

Patient has a positive urine microbiology culture report. That is, ≥ 10^5 microorganisms per ml of urine with no more than two species of microorganisms detected in the same urine sample.

UTI-B: not microbiologically confirmed symptomatic UTI

Patient has at least **TWO** of the following with no other recognised cause:

- fever (>38°C),
- urgency,
- frequency,
- dysuria, or suprapubic tenderness

AND at least **ONE** of the following:

a. Positive dipstick for leukocyte esterase and/or nitrite
b. Pyuria – White blood cells (WBC) or pus cells seen on urine specimen microscopy with ≥10 WBC/ml or ≥ 3 WBC/high-power field of unspun urine
c. Organisms seen on Gram stain of unspun urine
d. At least two urine cultures with repeated isolation of the same uropathogen (Gram-negative bacteria or *Staphylococcus saprophyticus*) with ≥ 10^2 colonies/ml urine in non-voided specimens
e. ≤10^5 colonies/ml of a single uropathogen (Gram-negative bacteria or *S. saprophyticus*) in a patient being treated with effective antimicrobial agent for a urinary infection
f. Clinician clinical diagnosis of a urinary tract infection
g. Clinician institutes appropriate therapy for a urinary infection

UTI reporting instruction:

For urinary tract infection, only fill in one subcategory (where more than one UTI definition is met by the patient, prioritise urinary tract infection as UTI-A>UTI-B).

1.4 SST: Skin and soft tissue infection

SST-SKIN: Skin infection
Skin infections must meet at least **ONE** of the following criteria:

1. Patient has purulent drainage, pustules, vesicles, or boils
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause:
    - localised pain or tenderness,
    - localised swelling,
    - redness or
    - heat

    AND at least **ONE** of the following:
    a. Organisms cultured from aspirate or drainage from affected site. If organisms isolated on culture are normally considered to be components of normal skin flora (i.e., diphtheroids [*Corynebacterium* spp], *Bacillus spp.* [not *Bacillus anthracis*], *Propionibacterium* spp, coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp), they must be isolated in a pure culture
    b. Organisms cultured from blood
    c. Positive antigen test performed on infected tissue or blood (e.g., herpes simplex virus, varicella zoster virus, *Haemophilus influenzae*, *Neisseria meningitidis*)
    d. Multinucleated giant cells seen on microscopic examination of affected tissue
    e. Diagnostic single antibody titre (elevated level of IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen

SST-SKIN reporting instructions:

- **Report decubitus ulcer/pressure sore infection involving skin as SST-DECU**
- **Report infected burns as SST-BURN**
- **Report breast abscesses or mastitis as SST-BRST**

SST-DECU: Decubitus ulcer or pressure sore, including both superficial and deep infections
Decubitus ulcer/pressure sore infections must meet the following criteria:

1. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: redness, tenderness, or swelling of decubitus ulcer/pressure sore wound edges **and** at least **ONE** of the following:
    a. Organisms cultured from properly-collected fluid or tissue* (see below)
    b. Organisms cultured from blood

*Purulent drainage from the decubitus ulcer/pressure sore alone is not sufficient evidence of an infection. Microorganisms cultured from surface swabs of a decubitus ulcer are not sufficient evidence that the ulcer is infected. A properly-collected specimen from a decubitus ulcer involves needle aspiration of fluid or biopsy of tissue from the ulcer margin.

SST-BRST: Breast abscess or mastitis
A breast abscess or mastitis must meet at least **ONE** of the following criteria:

1. Patient has a positive microbiology culture result of affected breast tissue or fluid obtained by incision and drainage or needle aspiration
2. Patient has a breast abscess or other evidence of infection seen during a surgical operation or histopathologic examination
3. Patient has fever (>38 C) and local inflammation of the breast **and** clinician diagnosis of breast abscess

SST-BURN: Burn wound infection

Burn wound infections must meet at least **ONE** of the following criteria:

1. Patient has a change in burn wound appearance or character, such as rapid eschar separation, or dark brown, black, or violaceous discoloration of the eschar or oedema at wound margin **and** histologic examination of a burn biopsy shows invasion of organisms into adjacent viable tissue
2. Patient has a change in burn wound appearance or character, such as rapid eschar separation, or dark brown, black, or violaceous discoloration of the eschar, or oedema at wound margin **and** at least **ONE** of the following:
    a. Organisms cultured from blood in the absence of other identifiable infection
    b. Isolation of herpes simplex virus, histologic identification of inclusions by light or electron microscopy or visualisation of viral particles by electron microscopy in biopsies or lesion scrapings
3. Patient with a burn wound has at least **TWO** of the following signs or symptoms with no other recognised cause: fever (>38 C) or hypothermia (< 36 C), hypotension, oliguria (urine output <20ml/hr), hyperglycaemia at previously tolerated level of dietary carbohydrate, or mental confusion **and** at least **ONE** of the following:
    a. Histologic examination of burn biopsy shows invasion of organisms into adjacent viable tissue
    b. Organisms cultured from blood
    c. Isolation of herpes simplex virus, histologic identification of inclusions by light or electron microscopy, or visualization of viral particles by electron microscopy in biopsies or lesion scrapings

NOTE: Purulence alone at the burn wound site is not adequate for the diagnosis of burn wound infection. Fever alone in a burn patient is not adequate for the diagnosis of a burn wound infection, because fever may be the result of tissue trauma or the patient may have an infection at another site.

SST-ST: Soft tissue (necrotising fasciitis, infectious gangrene, necrotising cellulitis, infectious myositis, lymphadenitis, or lymphangitis)

Soft tissue infections must meet at least **ONE** of the following criteria:

1. Patient has organisms cultured from tissue or drainage from affected site
2. Patient has purulent drainage at affected site
3. Patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination
4. Patient has at least **TWO** of the following signs or symptoms at the affected site with no other recognised cause: localised pain or tenderness, redness, swelling, or heat **AND** at least **ONE** of the following:
    a. Organisms cultured from blood
    b. Positive antigen test performed on blood or urine (e.g., *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Neisseria meningitidis*, Group B *Streptococcus*, *Candida* spp.)
    c. Diagnostic single antibody titre (elevated level of IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen

Reporting instructions

- **Report decubitus ulcer/pressure sore infection which involves soft tissues as SST-DECU.**
- **Report infection of deep pelvic tissues as REPR-OREP.**

1.5 SSI: Surgical site infection

Superficial incisional (SSI-S)
Infection occurs within 30 days after the operation **and** infection involves only skin and subcutaneous tissue of the incision **and** at least **ONE** of the following is present:

1. Purulent drainage with or without laboratory confirmation, from the superficial incision
2. Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision
3. At least **ONE** of the following signs or symptoms of infection: pain or tenderness, localised swelling, redness, or heat **and** superficial incision is deliberately opened by surgeon, **unless** incision is culture-negative
4. Clinical diagnosis of superficial incisional SSI made by consultant clinician

Deep incisional (SSI-D)
Infection occurs within 30 days after the operation if no implant is left in place or within 90 days if implant is in place **and** the infection appears to be related to the operation **and** infection involves deep soft tissue (e.g., fascia, muscle) of the incision **and** at least **ONE** of the following:

1. Purulent drainage from the deep incision but not from the organ/space component of the surgical site
2. A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least **ONE** of the following signs or symptoms: fever (>38º C), localised pain or tenderness, unless incision is culture-negative
3. An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation or by histopathologic or radiologic examination
4. Diagnosis of deep incisional SSI made by consultant clinician

Organ/Space (SSI-O)
Infection occurs within 30 days after the operation if no implant is left in place or within 90 days if implant is in place **and** the infection appears to be related to the operation **and** infection involves any part of the anatomy (e.g., organs and spaces) other than the incision which was opened or manipulated during an operation **and** at least **ONE** of the following:

1. Purulent drainage from a drain that is placed through a stab wound into the organ/space
2. Organisms isolated from an aseptically-obtained microbiological culture of fluid or tissue in the organ/space
3. An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination
4. Diagnosis of organ/space SSI made by consultant clinician

SSI reporting instruction:
Report vaginal cuff infections as SSI-O if diagnosed within 30 days of hysterectomy. See section on REPR: Reproductive tract infection

1.6 BSI: Bloodstream infection

BSI: Laboratory-confirmed bloodstream infection

- **ONE** positive blood culture for a recognised pathogen (e.g., *Staphylococcus aureus, Escherichia coli, Candida albicans* etc.) [If any doubt regarding what constitutes a recognised pathogen, please discuss with microbiologist]
  OR

- Patient has at least **ONE** of the following signs or symptoms: fever (>38°C), chills or hypotension
  AND
  TWO positive blood cultures for a common skin contaminant** (the same organism must have been isolated from two separate blood culture samples, usually taken within a 48 hour period)

  **Skin contaminants = coagulase-negative staphylococci*, Micrococcus sp., Propionibacterium acnes, Bacillus spp., Corynebacterium spp.*

Sources of bloodstream infection:

- **Catheter related:** the same microorganism was cultured from the catheter or symptoms improve within 48 hours after removal of the catheter (C-PVC: peripheral catheter, C-CVC: central vascular catheter).

Important: Report C-CVC or C-PVC BSI as CRI3-CVC or CRI3-PVC respectively if microbiologically confirmed; see CRI3 definition.

- **Secondary to another infection:** the same microorganism was isolated from another infection site, or strong clinical evidence exists that bloodstream infection was secondary to another infection site, invasive diagnostic procedure or foreign body:

- pulmonary (S-PUL);
- urinary tract infection (S-UTI);
- digestive tract infection (S-DIG);
- surgical site infection (S-SSI);
- skin and soft tissue (S-SST);
- other (S-OTH).

- **Unkown origin (UO):** none of the above, bloodstream infection of unknown origin (verified during survey and no source found)

- **Unknown (UNK):** no information available about the source of the bloodstream infection or information missing

Note:

- Primary bloodstream infections include catheter-related BSI and BSI of unknown origin.

- A CVC-associated bloodstream infection according to CDC/NHSN definitions (as opposed to CVC-related BSI) is a primary BSI with central venous catheter use (even intermittent) in the 48 hours preceding the onset of the infection: therefore the presence of 'the relevant device' (central/peripheral vascular catheter) in the 48 hours before onset of infection is collected even in the absence of microbiological confirmation.

1.7 CRI: Catheter-related infection

There are three categories of catheter-related infection: CRI1, CRI2 & CRI3.

CRI1 and CRI2 are defined as CRI without a positive blood culture result. As the patient will not have a positive blood culture result, to reach the definition of CRI1 or CRI2, there must be clinical evidence of infection linked to that vascular catheter plus significant growth of a microorganism on the tip of the vascular catheter).

CRI3 is CRI with a positive blood culture result (at least **ONE** positive blood culture for a recognised pathogen and at least **TWO** positive blood cultures for common skin contaminants).

Note: CRI are further classified based on whether the infection is related to a peripheral vascular catheter (PVC) or a central vascular catheter (CVC).

CRI1-PVC: Local PVC-related infection (no positive blood culture)

- Semi-quantitative PVC tip culture with >15 colony-forming units (CFU) or quantitative PVC tip culture with $\geq 10^3$ CFU/ml of a microorganism isolated from the PVC tip
  AND
- There is evidence of pus/inflammation at the PVC insertion site

CRI2-PVC: General PVC-related infection (no positive blood culture)

- Semi-quantitative PVC tip culture with >15 colony-forming units (CFU) or quantitative PVC tip culture with $\geq 10^3$ CFU/ml of a microorganism isolated from the PVC tip
  AND
- The patient's clinical signs of systemic infection improve within 48 hours after PVC removal

CRI3-PVC: Microbiologically confirmed PVC-related bloodstream infection
When the same microorganism was cultured from both the blood **and** the vascular catheter (PVC tip or PVC exit site swab), this is microbiologically confirmed catheter-related BSI (CRI3).

- The same microorganism isolated from a positive blood culture taken 48 hours before or after removal of the PVC (at least **ONE** positive blood culture for a recognised pathogen and at least **TWO** positive blood cultures for common skin contaminants) **and** also from a positive culture of either:
  1. Semi-quantitative PVC tip culture with >15 colony-forming units (CFU) or quantitative PVC tip culture with $\geq 10^3$ CFU/ml of the same microorganism isolated from the PVC tip

  or

  2. Positive culture from pus swab of the PVC exit site with the same microorganism isolated from the swab

CRI1-CVC: Local CVC-related infection (no positive blood culture)

- Semi-quantitative CVC tip culture with >15 colony-forming units (CFU) or quantitative CVC tip culture with $\geq 10^3$ CFU/ml of a microorganism isolated from the CVC tip
  AND
- There is evidence of pus/inflammation at the CVC insertion site or tunnel

CRI2-CVC: General CVC-related infection (no positive blood culture)

- Semi-quantitative CVC tip culture with >15 colony-forming units (CFU) or quantitative CVC tip culture with $\geq 10^3$ CFU/ml of a microorganism isolated from the CVC tip
  AND
- The patient's clinical signs of systemic infection improve within 48 hours after CVC removal

CRI3-CVC: microbiologically confirmed CVC-related bloodstream infection (positive blood culture)
When the same microorganism was cultured from both the blood **and** the vascular catheter (CVC tip or CVC exit site swab), this is microbiologically confirmed catheter-related BSI (CRI3).

- The same microorganism isolated from a positive blood culture taken 48 hours before or after removal of the CVC (at least ONE positive blood culture for a recognised pathogen and at least TWO positive blood cultures for common skin contaminants) **and** also from a positive culture of either:
  1. Semi-quantitative CVC tip culture with >15 colony-forming units (CFU) or quantitative CVC tip culture with $\geq 10^3$ CFU/ml of the same microorganism isolated from the CVC tip

  or
  2. Positive culture from pus swab of the CVC exit site with the same micro-organism isolated from the swab

Criterion of differential time to positivity (DTP) of blood cultures achieved: When a patient with a CVC *in situ* develops symptoms or signs of infection, it is recommended that simultaneous blood cultures should be taken both from the CVC and from a peripheral vein. If the set of blood culture bottles taken from the CVC flag with positive bacterial growth two hours or more before/earlier than the set of blood culture bottles taken from the peripheral vein, this suggests that the CVC is the source of the patient's BSI. Positive DTP criterion can only be applied to CVC and peripheral blood culture sets taken at the same time.

A positive CVC/PVC tip culture with significant growth in the absence of positive blood cultures or local evidence of infection at the exit site or systemic signs of infection which improve within 48 hours of the CVC/PVC removal represents CVC/PVC colonisation or contamination of the CVC/PVC tip by skin organisms at the time of CVC/PVC removal. This should not be reported as CRI.

Note, when a patient has a BSI (at least **ONE** positive blood culture for a recognised pathogen and at least **TWO** positive blood cultures for common skin contaminants) without microbiological confirmation of the same organism from the vascular catheter and the patient's symptoms improve within 48 hours after removal of the catheter, this is clinically-diagnosed catheter-related primary BSI without microbiological confirmation (C-PVC or C-CVC).

For microbiology laboratory-confirmed bloodstream infections, only provide one of:

- Bloodstream infection (BSI), catheter related bloodstream infection (CRI3)
  [priority CRI3>BSI]

- Neonatal laboratory confirmed bloodstream infection caused by organisms other than coagulase-negative staphylococci (NEO-LCBI) or neonatal laboratory confirmed bloodstream infection caused by coagulase-negative staphylococci (NEO-CNSB)
  [priority NEO-LCBI>NEO-CNSB].

1.8 CVS: Cardiovascular system infection

CVS-VASC: Arterial or venous infection

Arterial or venous infection must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from arteries or veins removed during a surgical operation **and** blood culture not done or blood culture remains sterile.
2. Patient has evidence of arterial or venous infection seen during a surgical operation or on histopathologic examination.
3. Patient has at least **ONE** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), pain, erythema or heat at involved vascular site **AND** significant growth from an intravascular catheter tip using semi-quantitative culture with >15 colony-forming units (CFU) or quantitative CVC tip culture with ≥ 10^3 CFU/ml **AND** blood culture not done or blood culture remains sterile.
4. Patient has purulent drainage at involved vascular site **AND** blood culture not done or blood culture remains sterile.

CVS-VASC reporting instruction:

Report infection of an arteriovenous graft/shunt/fistula or intravascular catheter site without organisms cultured from blood as CVS-VASC.

CVS-ENDO: Endocarditis

Endocarditis of a native or prosthetic heart valve must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from valve or vegetation
2. Patient has **TWO** or more of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), new or changing cardiac murmur, embolic phenomena, skin manifestations (e.g., petechiae, splinter haemorrhages, painful subcutaneous nodules), congestive heart failure or cardiac conduction abnormality **AND** at least **ONE** of the following:
   a. Microorganisms cultured from two or more sets of blood cultures
   b. Organisms seen on Gram's stain of cardiac valve when valve culture is sterile or valve culture not done
   c. Valvular vegetation seen during a surgical operation or at postmortem
   d. Positive antigen test on blood or urine (e.g., *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Neisseria meningitidis*, or Group B *Streptococcus*)
   e. Evidence of new vegetation seen on echocardiogram

   And if diagnosis is made in a living patient (*ante mortem*), clinician institutes appropriate antimicrobial therapy

CVS-CARD: Myocarditis or pericarditis

Myocarditis or pericarditis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from pericardial tissue or fluid obtained by needle aspiration or during a surgical operation
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), chest pain, paradoxical pulse or increased heart size **AND** at least **ONE** of the following:
   a. abnormal electrocardiogram (ECG) consistent with myocarditis or pericarditis
   b. Positive antigen test on blood (e.g., *Haemophilus influenzae*, *Streptococcus pneumoniae*)
   c. Evidence of myocarditis or pericarditis on histologic examination of heart tissue
   d. Four-fold rise in type-specific serum antibody, with or without direct isolation of a virus from pharynx or faeces
   e. Pericardial effusion identified by echocardiogram, CT scan, MRI or angiography

NOTE: Most cases of pericarditis arising after cardiac surgery or myocardial infarction are not infectious. Discuss suspected HAI pericarditis case with clinician responsible for care of patient.

CVS-MED: Mediastinitis

Mediastinitis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from mediastinal tissue or fluid obtained during a surgical operation or needle aspiration
2. Patient has evidence of mediastinitis seen during a surgical operation or on histopathologic examination
3. Patient has at least **ONE** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), chest pain or sternal instability **AND** at least **ONE** of the following:
    a. Purulent discharge from mediastinal area
    b. Microorganisms cultured from blood or discharge from mediastinal area
    c. Mediastinal widening on chest x-ray

CVS-MED reporting instruction:

Report mediastinitis arising following cardiac surgery that is accompanied by sternal osteomyelitis as a surgical site infection-organ/space (SSI-O).

1.9 GI: Gastrointestinal system infection

GI-CDI: *Clostridium difficile* infection

Clostridium difficile infection must meet at least **ONE** of the following criteria:

1. Diarrhoeal stools or toxic megacolon **AND** a positive laboratory assay for *C. difficile* toxin A and/or toxin B in stools **OR** toxin-producing *C. difficile* detected in stool via culture, PCR or other means
2. Pseudomembranous colitis revealed by lower gastro-intestinal endoscopy
3. Colonic histopathology characteristic of *C. difficile* infection (with or without diarrhoea) on a specimen obtained during endoscopy, colectomy or post mortem

REPORTING NOTE: If clinical signs of *Clostridium difficile* infection appear within 28 days after hospital discharge period, GI-CDI must be defined as hospital-acquired infection (HAI)

If you report CDI as an HAI, don't forget to also report *C. difficile* as the causative microorganism using MO-code CLODIF. The only circumstance where CLODIF would not be reported would be if the patient's CDI was diagnosed only on the basis of findings of pseudomembranous colitis at endoscopy or colectomy without a positive microbiological result for *C. difficile* toxin.

GI-GE: Gastroenteritis (excluding CDI)

Gastroenteritis must meet at least **ONE** of the following criteria:

1. Patient has an acute onset of diarrhoea (liquid stools for more than 12 hours) with or without vomiting or fever (>38^{0}C) and no likely non-infectious cause (possible non-infectious causes include: bowel preparation for diagnostic tests, therapeutic regimen other than antimicrobial agents (e.g., laxatives, post-GI surgery), acute exacerbation of a chronic condition or psychological stress).
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: nausea, vomiting, abdominal pain, fever (>38^{0}C) or headache
   AND at least **ONE** of the following:
   a. An enteric pathogen (e.g., *Salmonella spp*, *Shigella spp*, *Campylobacter spp*. *E. coli* O157) is cultured from stool or rectal swab or detected on PCR
   b. An enteric pathogen is detected by routine or electron microscopy (e.g., norovirus, small round structured virus, *Cryptosporidium spp.*)
   c. An enteric pathogen is detected by antigen or antibody assay on blood or faeces (e.g., rotavirus, adenovirus)
   d. Evidence of an enteric pathogen is detected by cytopathic changes in tissue culture (toxin assay)
   e. Diagnostic single antibody titre elevated level of IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen.

GI-GIT: Gastrointestinal tract including oesophagus, stomach, small and large bowel and rectum) excluding gastroenteritis and appendicitis

Gastrointestinal tract infections, excluding gastroenteritis and appendicitis, must meet at least **ONE** of the following criteria:

1. Patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause and compatible with infection of the organ or tissue involved: fever (>38 C), nausea, vomiting, abdominal pain or tenderness
   AND at least **ONE** of the following:

a. Organisms cultured from drainage or tissue obtained during a surgical operation or endoscopy or from a surgically-placed drain
b. Organisms seen on Gram or potassium hydroxide (KOH) fungal stain or multinucleated giant cells seen on microscopic examination of drainage or tissue obtained during a surgical operation or endoscopy or from a surgically-placed drain
c. Organisms cultured from blood
d. Evidence of pathologic findings on radiographic examination
e. Evidence of pathologic findings on endoscopic examination (e.g., Candida oesophagitis or proctitis)

GI-HEP: Hepatitis

Hepatitis must meet the following criteria:

1. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: fever (>38^{0}C), anorexia, nausea, vomiting, abdominal pain, jaundice or history of blood product transfusion within the previous three months
   AND at least **ONE** of the following:
   a. Positive antigen or antibody test for hepatitis A virus, hepatitis B virus, hepatitis C virus or delta hepatitis
   b. Abnormal liver function tests (e.g., elevated ALT/ AST, bili rubin)
   c. Cytomegalovirus (CMV) detected in urine or oropharyngeal secretions

GI-HEP reporting instructions:

- **Do not report hepatitis or jaundice of non-infectious origin (alpha-1 antitrypsin deficiency)**
- **Do not report hepatitis or jaundice resulting from exposure to hepatotoxins (alcoholic or acetaminophen-induced hepatitis)**
- **Do not report hepatitis or jaundice resulting from biliary obstruction (cholecystitis)**

GI-IAB: Intraabdominal, not specified elsewhere; including gallbladder, bile ducts, liver (excluding viral hepatitis), spleen, pancreas, peritoneum, subphrenic or subdiaphragmatic space or other intraabdominal tissue or area not specified elsewhere

Intraabdominal infections must meet at least **ONE** of the following criteria:

1. Patient has organisms cultured from purulent material from intraabdominal space obtained during a surgical operation or needle aspiration
2. Patient has abscess or other evidence of intraabdominal infection seen during a surgical operation or histopathologic examination
3. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: fever (>38^{0}C), nausea, vomiting, abdominal pain, or jaundice
   AND at least **ONE** of the following:
   a. Organisms cultured from drainage from surgically-placed drain (e.g., closed suction drainage system, open drain or T-tube drain)
   b. Organisms seen on Gram stain of drainage or tissue obtained during surgical operation or needle aspiration
   c. Organisms cultured from blood and radiographic evidence of infection (e.g., abnormal findings on ultrasound, CT scan, MRI, or radiolabelled scans [gallium, technetium] or on abdominal x-ray)

GI-IAB reporting instruction:

Do not report pancreatitis (an inflammatory syndrome characterized by abdominal pain, nausea, and vomiting associated with high serum levels of pancreatic enzymes) unless it is determined to be infectious in origin.

1.10 BJ: Bone and joint infection

BJ-BONE: Osteomyelitis

Osteomyelitis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from bone
2. Patient has evidence of osteomyelitis on direct examination of the bone during a surgical operation or on histopathologic examination
3. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: fever (>38^{0}C), localised swelling, tenderness, heat or drainage at suspected site of bone infection **AND** at least **ONE** of the following:
    a. Organisms cultured from blood
    b. Positive blood antigen test (e.g.,*Streptococcus pneumoniae*)
    c. Radiographic evidence of infection (e.g., abnormal findings on x-ray, CT scan, MRI, radiolabelled scans [gallium, technetium])

BJ-BONE reporting instruction:

Report mediastinitis arising following cardiac surgery that is accompanied by sternal osteomyelitis as a surgical site infection-organ/space (SSI-O).

BJ-JNT: Joint or bursa

Joint or bursa infections must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from joint fluid or synovial biopsy
2. Patient has evidence of joint or bursa infection seen during a surgical operation or on histopathologic examination
3. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: joint pain, swelling, tenderness, heat, evidence of effusion or limitation of motion
   AND at least **ONE** of the following:
    a. Organisms and white blood cells (WBC) or pus cells seen on Gram stain of joint fluid
    b. Positive antigen test on blood, urine, or joint fluid
    c. Cellular profile and chemistries of joint fluid compatible with infection and not explained by an underlying rheumatologic disorder
    d. Radiographic evidence of infection (e.g., abnormal findings on x-ray, CT scan, MRI, radiolabelled scans [gallium, technetium])

BJ-DISC: Disc space infection

Vertebral disc space infection must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from vertebral disc space tissue obtained during a surgical operation or needle aspiration
2. Patient has evidence of vertebral disc space infection seen during a surgical operation or on histopathologic examination
3. Patient has fever (>38^{0}C) with no other recognized cause or pain at the involved vertebral disc space **AND** radiographic evidence of infection (e.g., abnormal findings on x-ray, CT scan, MRI, radiolabelled scan [gallium, technetium])
4. Patient has fever (>38^{0}C) with no other recognised cause and pain at the involved vertebral disc space **AND** positive antigen test on blood or urine (e.g., *Haemophilis influenzae, Streptococcus pneumoniae, Neisseria meningitidis,* or Group B *Streptococcus*)

1.11 CNS: Central nervous system infections

CNS-IC: Intracranial infection (brain abscess, subdural or epidural infection, encephalitis)
Intracranial infection must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from brain tissue or dura
2. Patient has an abscess or evidence of intracranial infection seen during a surgical operation or on histopathologic examination
3. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: headache, dizziness, fever (>38^{0}C), localising neurologic signs, changing level of consciousness or confusion
   AND at least **ONE** of the following:
   a. Microorganisms seen on microscopic examination of brain or abscess tissue obtained by needle aspiration or by biopsy during a surgical operation or post mortem
   b. Positive antigen test on blood or urine
   c. Radiographic evidence of infection (e.g., abnormal findings on ultrasound, CT scan, MRI, radiolabelled brain scan or angiogram)
   d. Diagnostic single antibody titre (elevated IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen

   and if diagnosis is made in a living patient (ante mortem), clinician institutes appropriate antimicrobial therapy

CNS-IC reporting instruction:
If meningitis and a brain abscess are present together, report the infection as CNS-IC.

CNS-MEN: Meningitis or ventriculitis
Meningitis or ventriculitis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from cerebrospinal fluid (CSF)
2. Patient has at least **ONE** of the following signs or symptoms with no other recognised cause: fever (>38^{0}C), headache, neck stiffness, meningeal signs, cranial nerve signs or irritability
   AND at least **ONE** of the following:
   a. Increased CSF white cell count, elevated CSF protein and/or decreased CSF glucose
   b. Organisms seen on CSF Gram stain
   c. Organisms cultured from blood
   d. Positive antigen test of CSF, blood or urine
   e. Diagnostic single antibody titre (elevated IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen
   And, if diagnosis is made in a living patient (ante mortem), clinician institutes appropriate antimicrobial therapy

CNS-MEN reporting instructions:

- **Report CSF shunt infection as SSI-O if it occurs within 90 days of date of shunt placement surgery. If CSF shunt infection occurs more than 90 days after shunt placement or if CSF shunt infection occurs at any time after manipulation/access of the shunt, report as CNS-MEN**
- **Report meningo-encephalitis as CNS-MEN**
- **Report spinal abscess with meningitis as CNS-MEN**

CNS-SA: Spinal abscess without meningitis

An abscess of the spinal epidural or subdural space, without involvement of the cerebrospinal fluid (CSF) or adjacent bone structures, must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from abscess in the spinal epidural or subdural space.
2. Patient has an abscess in the spinal epidural or subdural space seen during a surgical operation or at post mortem or evidence of an abscess seen during a histopathologic examination.
3. Patient has at least **ONE** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), back pain, focal tenderness, radiculitis, paraparesis or paraplegia
   AND at least **ONE** of the following:
   a. Microorganisms cultured from blood
   b. Radiographic evidence of a spinal abscess (e.g., abnormal findings on myelography, ultrasound, CT scan, MRI or other scan)

   and if diagnosis is made in a living patient (ante mortem), clinician institutes appropriate antimicrobial therapy.

Reporting instruction:

Report spinal abscess with meningitis as meningitis CNS-MEN

1.12 EENT: Eye, ear, nose and throat or mouth infection

EENT-CONJ: Conjunctivitis
Conjunctivitis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from purulent exudate obtained from the conjunctiva or adjacent tissues, such as eyelid, cornea, meibomian glands or lacrimal glands.
2. Patient has pain or redness of conjunctiva or around eye and at least **ONE** of the following:-
    a. White blood cells (WBC) or pus cells and organisms seen on Gram stain of exudate.
    b. Purulent exudates from conjunctiva or adjacent tissues.
    c. Positive antigen test (e.g., enzyme linked immunosorbant assay (ELISA) or immunofluorescence (IF) for *Chlamydia trachomatis*, herpes simplex virus, adenovirus) on exudate or conjunctival scrapings.
    d. Multinucleated giant cells seen on microscopic examination of conjunctival exudate or scrapings.
    e. Positive viral culture.
    f. Diagnostic single antibody titre (elevated level of IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen.

EENT-CONJ reporting instructions:
- Report other infections of the eye as EENT-EYE
- Do not report chemical conjunctivitis caused by silver nitrate (AgNO3) as a hospital-acquired infection
- Do not report conjunctivitis that occurs as a part of a more widely disseminated viral illness (such as measles, chickenpox, or upper respiratory tract infection URI)

EENT-EYE: Eye, other than conjunctivitis
An infection of the eye, other than conjunctivitis, must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from anterior or posterior chamber or vitreous fluid.
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: eye pain, visual disturbance or hypopyon
   AND at least **ONE** of the following:
    a. Clinician diagnosis of an eye infection
    b. Positive antigen test on blood (e.g., *Haemophilus influenzae, Streptococcus pneumoniae*)
    c. Organisms cultured from blood

EENT-EAR: Ear mastoid
Otitis externa (external ear infection) must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from purulent drainage from ear canal.
2. Patient has at least **ONE** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), pain, redness or drainage from ear canal **and** organisms seen on Gram stain of purulent drainage.

Otitis media (middle ear infection) must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from fluid from middle ear obtained by tympanocentesis or at surgical operation.
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: fever (>38^{0}C), pain in the eardrum, inflammation, retraction or decreased mobility of eardrum or fluid behind eardrum.

Otitis interna (inner ear infection) must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from fluid obtained from inner ear at surgical operation.
2. Patient has a clinician diagnosis of inner ear infection.

Mastoiditis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from purulent drainage from mastoid.
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), pain, tenderness, erythema, headache or facial paralysis
   AND at least **ONE** of the following:
   a. organisms seen on Gram stain of purulent material from mastoid
   b. positive antigen test on blood

EENT-ORAL: Oral cavity (mouth, tongue, or gums)

Oral cavity infections must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from purulent material from tissues of oral cavity
2. Patient has an abscess or other evidence of oral cavity infection seen on direct examination, during a surgical operation or during a histopathologic examination
3. Patient has at least **ONE** of the following signs or symptoms with no other recognised cause: abscess, ulceration or raised white patches on inflamed mucosa or plaques on oral mucosa **AND** at least **ONE** of the following:
   a. Microorganisms seen on Gram stain
   b. Positive KOH (potassium hydroxide) stain for fungal hyphae
   c. Multinucleated giant cells seen on microscopic examination of mucosal scrapings
   d. Positive antigen test on oral secretions
   e. Diagnostic single antibody titre (elevated level of IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen
   f. Clinician diagnosis of infection and treatment with topical or oral antifungal therapy

EENT-ORAL reporting instruction:

Report hospital-acquired primary herpes simplex infections of the oral cavity as EENT- ORAL; Recurrent herpes infections are not HAI.

EENT-SINU: Sinusitis

Sinusitis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from purulent material obtained from sinus cavity
2. Patient has at least **ONE** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), pain or tenderness over the involved sinus, headache, purulent exudate or nasal obstruction
   AND at least **ONE** of the following:
   a. Positive trans-illumination
   b. Positive radiographic examination (including CT scan)

EENT-UR: Upper respiratory tract, pharyngitis, laryngitis, epiglottitis

Upper respiratory tract infections must meet at least **ONE** of the following criteria:

1. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: fever (>38^{0}C), erythema of pharynx, sore throat, cough, hoarseness or purulent exudate in throat
   AND at least **ONE** of the following:
   a. Microorganisms cultured from the specific site
   b. Microorganisms cultured from blood
   c. Positive antigen test on blood or respiratory secretions
   d. Diagnostic single antibody titre (elevated level of IgM) or 4-fold increase in paired sera (elevation of IgG between acute and convalescent serum samples) for pathogen
   e. Clinician diagnosis of an upper respiratory infection
2. Patient has an abscess seen on direct examination, during a surgical operation, or during a histopathologic examination

1.13 REPR: Reproductive tract infection

REPR-EMET: Endometritis
Endometritis must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from fluid or tissue from endometrium obtained during surgical operation, by needle aspiration or by brush biopsy.
2. Patient has at least **TWO** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), abdominal pain, uterine tenderness or purulent drainage from uterus.

REPR-EMET reporting instruction:
Report postpartum endometritis as a hospital-acquired infection unless the amniotic fluid is infected at the time of admission or the patient was not admitted to hospital until 48 hours after rupture of the membrane

REPR-EPIS: Episiotomy
Episiotomy infection must meet at least **ONE** of the following criteria:

1. Post-vaginal delivery patient has purulent drainage from the episiotomy wound.
2. Post-vaginal delivery patient has an episiotomy abscess.

REPR-VCUF:
Vaginal cuff infections must meet at least **ONE** of the following criteria:

1. Post-hysterectomy patient has purulent drainage from the vaginal cuff
2. Post-hysterectomy patient has an abscess at the vaginal cuff
3. Post-hysterectomy patient has pathogens cultured from fluid or tissue obtained from the vaginal cuff

REPR-VCUF reporting instruction:
Vaginal cuff infections by definition occur post-hysterectomy. Therefore, if a vaginal cuff infection is diagnosed within 30 days of hysterectomy, it should be reported as SSI-O. If vaginal cuff infection is diagnosed >30 days after hysterectomy, record as REPR-VCUF
Report vaginal cuff infections as SSI-O if diagnosed within 30 days of hysterectomy

REPR-OREP: Other infections of the male reproductive tract (epididymis, testes, prostate) or female reproductive tract (vagina, ovaries, uterus, or other deep pelvic tissues, excluding endometritis or vaginal cuff infections)
Other infections of the male or female reproductive tract must meet at least **ONE** of the following criteria:

1. Patient has microorganisms cultured from tissue or fluid from affected site.
2. Patient has an abscess or other evidence of infection of affected site seen during a surgical operation or on histopathologic examination.
3. Patient has **TWO** of the following signs or symptoms with no other recognised cause: Fever (>38^{0}C), nausea, vomiting, pain, tenderness or dysuria
   AND at least **ONE** of the following:
   a. Microorganisms cultured from blood
   b. Clinician diagnosis

1.14 SYS: Systemic infection

SYS-DI: Disseminated infection
Disseminated infection is infection involving multiple organs or systems, without an apparent single site of infection, usually of viral origin, and with signs or symptoms with no other recognised cause and compatible with infectious involvement of multiple organs or systems.

SYS-DI reporting instructions:

- **Use this code (SYS-DI) for viral infections involving multiple organ systems (e.g., varicella, measles, rubella, mumps, erythema infectiosum/parvovirus B19). These infections often can be identified by clinical criteria alone.**
- **Do not use this code for HAI with multiple metastatic sites, such as bacterial endocarditis with embolic infection to other sites. Only the primary site of such disseminated HAI should be reported.**
- **Do not report fever/pyrexia of unknown origin (FUO/PUO) as SYS-DI**
- **Report viral exanthems or rash illness as SYS-DI**

SYS-CSEP: Clinical sepsis in adults and children

Patient has at least **ONE** of the following:- clinical signs or symptoms with no other recognised cause: Fever (>38° C), hypotension (systolic blood pressure <90 mmHg) or oliguria (urine output <20 ml/hr)

- **and** blood culture not done or no micro-organisms or antigen detected in blood
- **and** no apparent infection at another site
- **and** clinician institutes treatment for sepsis

SYS-CSEP reporting instructions:

- **Do not use this code unless there is absolutely no other potential focus for HAI (last resort definition)**

- **For CSEP in neonates, use NEO-CSEP case definition (see below)**

1.15 NEO: Specific neonatal case definitions

Where a suspected HAI in a neonate does not meet a specific neonatal case definition below, (e.g. skin infection) check the other HAI definitions and record as appropriate.

NEO-CSEP: Clinical sepsis in a neonate

ALL of the **THREE** following criteria should be met:

1. Supervising clinician started appropriate antimicrobial therapy for sepsis for a duration of therapy of at least 5 days.
2. No detection of microorganisms in blood culture or blood culture not done.
3. No obvious infection at another site.

AND TWO of the following criteria (without other apparent cause):

a. Fever (>38°C) or temperature instability or hypothermia (<36.5°C).
b. Tachycardia (heart rate > 200 beats per minute) or new/increased bradycardia (heart rate <80 beats per minute).
c. Capillary refilling time (CRT) >2 seconds.
d. New or increased apnoea(s) > 20 seconds.
e. Unexplained metabolic acidosis.
f. New-onset hyperglycaemia (>140mg/dl).
g. Another sign of sepsis: skin colour (only if the capillary refill time (CRT) is not used), laboratory signs (CRP, interleukin), increased oxygen requirement (intubation), unstable general condition of the patient, apathy.

Note: Detection of coagulase-negative staphylococci (Co-NS) in one set of blood cultures taken from a neonate should not exclude the diagnosis of clinical sepsis. Clinical sepsis in a neonate (NEO-CSEP) can also be diagnosed with a single positive blood culture with Co--NS, which would usually be considered as a blood culture contaminant, unless other criteria of laboratory-confirmed bloodstream infection are met, provided the criteria of clinical sepsis (NEO-CSEP) above have been met.

NEO-LCBI: Laboratory-confirmed BSI (with organisms other than CoNS) in a neonate

A recognised pathogen (other than coagulase-negative staphylococci (Co-NS) cultured from blood or cerebrospinal fluid (CSF). CSF is included in this definition because meningitis in neonates is usually haematogenous. A positive CSF can be regarded as evidence of BSI in a neonate, even if blood cultures remain sterile or blood cultures were not taken **and** at least **TWO** of:

a. Fever (>38°C) or temperature instability or hypothermia (<36.5°C)
b. Tachycardia (heart rate > 200 beats per minute) or new/increased bradycardia (heart rate <80 beats per minute)
c. Capillary refilling time (CRT) >2 seconds
d. New or increased apnoea(s) > 20 seconds)
e. Unexplained metabolic acidosis
f. New-onset hyperglycaemia (>140mg/dl)
g. Another sign of sepsis: skin colour (only if the capillary refill time (CRT) is not used), laboratory signs (CRP, interleukin), increased oxygen requirement (intubation), unstable general condition of the patient, apathy

REPORTING NOTE:

- **Report the source of the neonatal BSI, if identified, in the field 'BSI source'**
- **If the neonate meets both of the case definitions for NEO-LCBI and NEO-CNSB, prioritise reporting of BSI as NEO-LCBI**

NEO-CNSB: Laboratory-confirmed BSI with coagulase-negative staphylococci (Co-NS) in a neonate

Coagulase-negative staphylococci (Co-NS), includes *Staphylococcus epidermidis,* cultured from blood or vascular catheter tip
AND at least **TWO** of:

a. Fever (>38°C) or temperature instability or hypothermia (<36.5°C)
b. Tachycardia (heart rate > 200 beats per minute) or new/increased bradycardia (heart rate <80 beats per minute)
c. Capillary refilling time (CRT) >2 seconds
d. New or increased apnoea(s) > 20 seconds)
e. Unexplained metabolic acidosis
f. New-onset hyperglycaemia (>140mg/dl)
g. Another sign of sepsis: skin colour (only if the capillary refill time (CRT) is not used), laboratory signs (CRP, interleukin), increased oxygen requirement (intubation), unstable general condition of the patient, apathy)

AND neonate has **ONE** of: C-reactive protein >2.0 mg/dL, immature/total neutrophil ratio (I/T ratio) >0.2, leukocytes <5/nL, platelets <100/nL.

REPORTING NOTE:

- **Report the source of the neonatal BSI, if identified, in the field 'BSI source'**
- **If the neonate meets both of the case definitions for NEO-LCBI and NEO-CNSB, prioritise reporting of BSI as NEO-LCBI**

NEO-PNEU: Pneumonia in a neonate

Neonate has respiratory compromise
AND
evidence of a new pulmonary infiltrate, consolidation or pleural effusion on chest X ray
AND at least **FOUR** of:

a. Temperature (>38^{0}C or <36.5^{0}C) or temperature instability
b. Tachycardia or bradycardia
c. Tachypnoea or apnoea
d. Dyspnoea
e. Increased respiratory secretions
f. New onset of purulent sputum
g. Isolation of a microorganism from respiratory secretions
h. C-reactive protein >2.0 mg/dL
i. Immature/total neutrophil ratio (I/T ratio) >0.2.

NEO-NEC: Necrotising enterocolitis in a neonate
Histopathological evidence of necrotising enterocolitis
OR
At least **ONE** characteristic radiographic abnormality (pneumoperitoneum, pneumatosis intestinalis, unchanging 'rigid' loops of small bowel)
AND at least **TWO** of the following without other explanation: vomiting, abdominal distension, pre-feeding residuals, persistent microscopic or gross blood in stools

********END*******