Public Health England

Protecting and improving the nation's health

Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute-care hospitals

Codebook
v1.0

July 2016

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

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Published July 2016
PHE publications gateway number: 2016185

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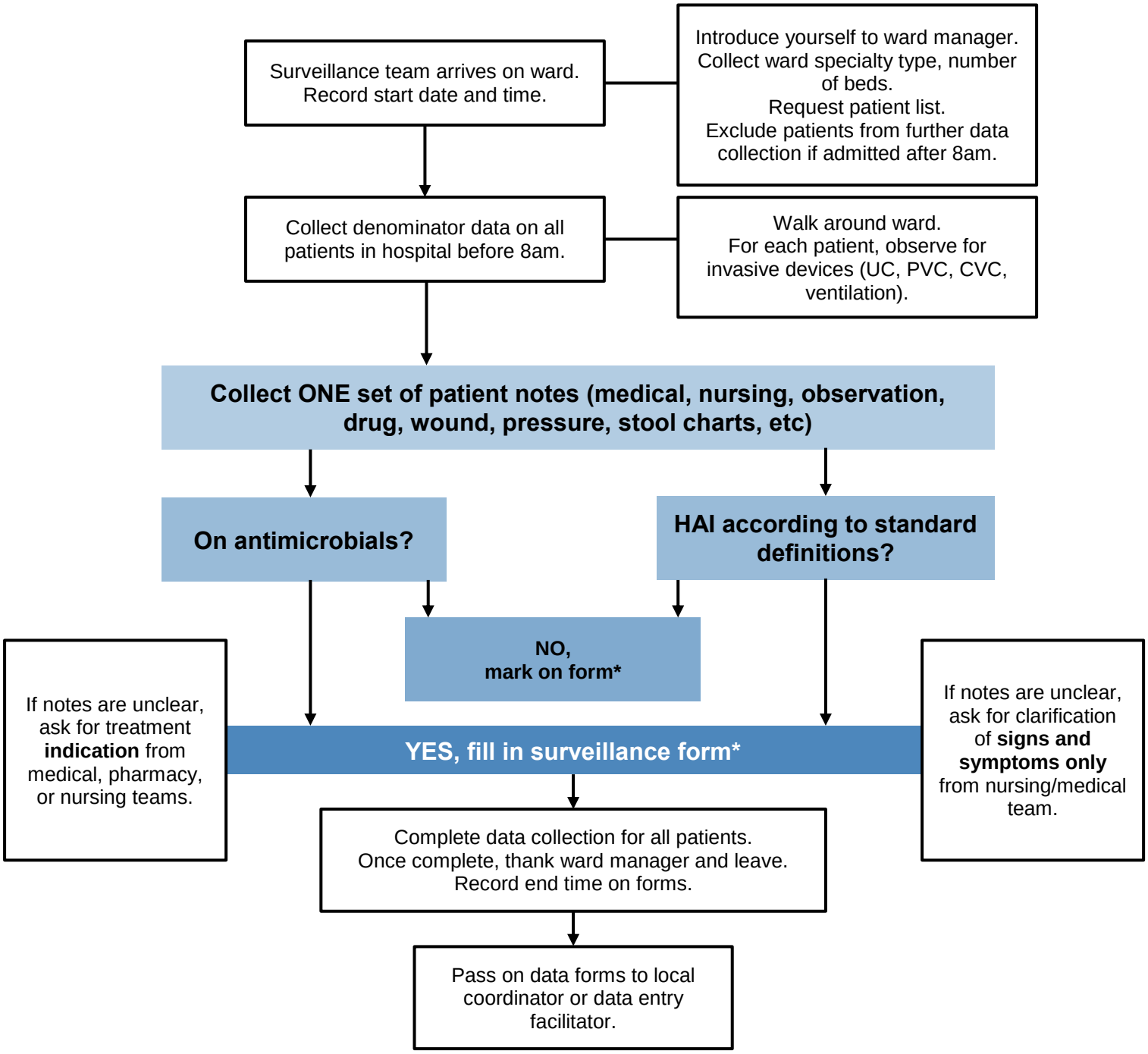
Recommended case finding algorithm for healthcare-associated infections



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Specialty code list

Specialty codes are used for following variables: ward specialty, patient/consultant specialty, specialised hospital (form H).

Categories (Ward Specialty)	Patient/consultant Specialty Code	Patient/consultant Specialty Name
Surgical specialties (SUR)	SURGEN	General surgery
Surgical specialties (SUR)	SURDIG	Digestive tract surgery
Surgical specialties (SUR)	SURORTR	Orthopaedics and surgical traumatology
Surgical specialties (SUR)	SURORTO	Orthopaedics
Surgical specialties (SUR)	SURTR	Traumatology
Surgical specialties (SUR)	SURCV	Cardio surgery and vascular surgery
Surgical specialties (SUR)	SURCARD	Cardio surgery
Surgical specialties (SUR)	SURVASC	Vascular surgery
Surgical specialties (SUR)	SURTHO	Thoracic surgery
Surgical specialties (SUR)	SURNEU	Neurosurgery
Surgical specialties (SUR)	SURPED	Paediatric general surgery
Surgical specialties (SUR)	SURTRANS	Transplantation surgery
Surgical specialties (SUR)	SURONCO	Surgery for cancer
Surgical specialties (SUR)	SURENT	ENT
Surgical specialties (SUR)	SUROPH	Ophthalmology
Surgical specialties (SUR)	SURMAXFAC	Maxillo-facial surgery
Surgical specialties (SUR)	SURSTODEN	Stomatology/Dentistry
Surgical specialties (SUR)	SURBURN	Burns care
Surgical specialties (SUR)	SURURO	Urology
Surgical specialties (SUR)	SURPLAS	Plastic and reconstructive surgery
Surgical specialties (SUR)	SUROTH	Other surgery
Medical specialties (MED)	MEDGEN	General medicine
Medical specialties (MED)	MEDGAST	Gastro-enterology
Medical specialties (MED)	MEDHEP	Hepatology
Medical specialties (MED)	MEDENDO	Endocrinology
Medical specialties (MED)	MEDONCO	Oncology
Medical specialties (MED)	MEDHEMA	Haematology
Medical specialties (MED)	MEDBMT	Bone marrow transplantation (BMT)
Medical specialties (MED)	MEDHEMBMT	Haematology/BMT
Medical specialties (MED)	MEDCARD	Cardiology
Medical specialties (MED)	MEDDERM	Dermatology
Medical specialties (MED)	MEDNEPH	Nephrology
Medical specialties (MED)	MEDNEU	Neurology

Categories (Ward Specialty)	Patient/consultant Specialty Code	Patient/consultant Specialty Name
Medical specialties (MED)	MEDPNEU	Pneumology
Medical specialties (MED)	MEDRHEU	Rheumatology
Medical specialties (MED)	MEDID	Infectious diseases
Medical specialties (MED)	MEDTR	Medical traumatology
Medical specialties (MED)	MEDOTH	Other medical
Paediatrics (PED)	PEDGEN	Paediatrics general, not specialised
Neonatology (NEO)	PEDNEO	Neonatology (excl. healthy neonates)
Neonatology (NEO)	PEDBAB	Healthy neonates (paediatrics)
Neonatology (NEO)	ICUNEO	Neonatal ICU
Paediatrics (PED)	ICUPED	Paediatric ICU
Intensive Care Medicine (ICU)	ICUMED	Medical ICU
Intensive Care Medicine (ICU)	ICUSUR	Surgical ICU
Intensive Care Medicine (ICU)	ICUMIX	Mixed (polyvalent) ICU, general intensive or critical care
Intensive Care Medicine (ICU)	ICUSPEC	Specialised ICU
Intensive Care Medicine (ICU)	ICUOTH	Other ICU
Gynaecology/Obstetrics (GO)	GOOBS	Obstetrics /maternity
Gynaecology/Obstetrics (GO)	GOGYN	Gynaecology
Gynaecology/Obstetrics (GO)	GOBAB	Healthy neonates (maternity)
Geriatrics (GER)	GER	Geriatrics, care for the elderly
Psychiatrics (PSY)	PSY	Psychiatrics
Rehabilitation (RHB)	RHB	Rehabilitation
Long-term care (LTC)	LTC	Long-term care
OTHER (OTH)	OTH	Others not listed
Mixed (MIX)	MIX	Combination of specialties

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Surgery

Surgery is defined as a procedure where an incision is made (not just a needle puncture), with breach of mucosa and/or skin – not necessarily in the operating theatre.

Endoscopy without incision is NOT surgery (ie endoscopy with biopsy/ lavage/ washout/ visualization or stent replacement without incision) only is not surgery.

Therefore cystoscopy, bronchoscopy, colonoscopy, ERCP with biopsy is NOT surgery.

Non-NHSN surgery (examples)

- obstetrical procedures: peri-delivery/labour with incision ICD-9-CM 75.3 or 75.9
- dental extraction: ICD-9-CM code 23.1 Surgical removal
- transurethral resection of prostate
- incision and drainage of abscess with secondary closure
- any diabetic forefoot amputation with healing by secondary intention
- any other operation where healing is by secondary intention
- tonsillectomy
- application of external fixator/Olizarov
- extraventricular drain
- hysteroscopic removal of fibroids
- evacuation of retained products of conception
- ERCP with incision of sphincter

NHSN surgery codes

Reference: NHSN operative procedure category mappings to ICD-9-CM codes, October 2010. Available from: www.cdc.gov/nhsn/PDFs/pscManual/9pscSSIcurrent.pdf.
An implant is defined as a nonhuman-derived implantable foreign body (eg, prosthetic heart valve, nonhuman vascular graft, mechanical heart, or hip prosthesis) that is permanently placed in a patient during surgery. (https://www.cdc.gov/hicpac/SSI/table1-SSI.html)

NHSN code	Operative procedure	Description	ICD-9-CM Codes	90 day surveillance
NHSN-AAA	Abdominal aortic aneurysm repair	Resection of abdominal aorta with anastomosis or replacement	38.34, 38.44, 38.64	If non human vascular graft in place
NHSN-AMP	Limb amputation	Total or partial amputation or disarticulation of the upper or lower limbs, including digits	84.00-84.19, 84.91	No

NHSN code	Operative procedure	Description	ICD-9-CM Codes	90 day surveillance
NHSN-APPY	Appendix surgery	Operation of appendix (not incidental to another procedure)	47.01, 47.09, 47.2, 47.91, 47.92, 47.99	No
NHSN-AVSD	Shunt for dialysis	Arteriovenostomy for renal dialysis	39.27, 39.42	If non human vascular graft in place
NHSN-BILI	Bile duct, liver or pancreatic surgery	Excision of bile ducts or operative procedures on the biliary tract, liver or pancreas (does not include operations only on gallbladder)	50.0, 50.12, 50.14, 50.21-50.23, 50.25, 50.26, 50.29, 50.3, 50.4, 50.61, 50.69, 51.31-51.37, 51.39, 51.41-51.43, 51.49, 51.51, 51.59, 51.61-51.63, 51.69, 51.71, 51.72, 51.79, 51.81-51.83, 51.89, 51.9151.95, 51.99, 52.09, 52.12, 52.22, 52.3**,** 52.4, 52.51-52.53, 52.5952.6, 52.7, 52.92, 52.95, 52.96, 52.99	No, biliary stents not included.
NHSN-BRST	Breast surgery	Excision of lesion or tissue of breast including radical, modified, or quadrant resection, lumpectomy, incisional biopsy, or mammoplasty.	85.12, 85.20-85.23, 85.31-85.36, 85.41-85.48, 85.50, 85.53, 85.54, 85.6, 85.70-85.76, 85.79, 85.9385.96	Only for breast implants
NHSN-CARD	Cardiac surgery	Procedures on the valves or septum of heart; does not include coronary artery bypass graft, surgery on vessels, heart transplantation, or pacemaker implantation	35.00 - 35.04, 35.10-35.14, 35.20-35.28, 35.3135.35, 35.39, 35.42, 35.50, 35.51, 35.53, 35.54, 35.60-35.63, 35.70-35.73, 35.81-35.84, 35.91-35.95, 35.98-35.99, 37.10, 37.11, 37.24, 37.31-37.33, 37.35, 37.36, 37.41, 37.49, 37.60*	Only for If non human vascular graft in place, prosthetic valves and pacemakers
NHSN-CEA	Carotid endarterectomy	Endarterectomy on vessels of head and neck (includes carotid artery and jugular vein)	38.12	No
NHSN-CBGB	Coronary artery bypass graft with both chest and donor site incisions	Chest procedure to perform direct revascularisation of the heart; includes obtaining suitable vein from donor site for grafting.	36.10-36.14, 36.19	If non human vascular graft in place

NHSN code	Operative procedure	Description	ICD-9-CM Codes	90 day surveillance
NHSN-CBGC	Coronary artery bypass graft with chest incision only	Chest procedure to perform direct vascularisation of the heart using, for example the internal mammary (thoracic) artery	36.15-36.17, 36.2	If non human vascular graft in place
NHSN-CHOL	Gallbladder surgery	Cholecystectomy and cholecystotomy	51.03, 51.04, 51.13, 51.21-51.24	No
NHSN-COLO	Colon surgery	Incision, resection, or anastomosis of the large intestine; includes large-to-small and small-to-large bowel anastomosis; does not include rectal operations	17.31-17.36, 17.39, 45.03, 45.26, 45.41, 45.49, 45.52, 45.71-45.76, 45.79, 45.81-45.83, 45.92-45.95, 46.03, 46.04, 46.10, 46.11, 46.13, 46.14, 46.43, 46.52, 46.75, 46.76, 46.94	No
NHSN-CRAN	Craniotomy	Incision through the skull to excise, repair, or explore the brain; does not include taps or punctures	01.12, 01.14, 01.21-01.25, 01.28, 01.31, 01.32, 01.39, 01.41, 01.42, 01.51-01.53, 01.59, 02.11-02.14, 02.91-02.93, 07.51-07.54, 07.59, 07.61-07.65, 07.68, 07.69, 07.71, 07.72, 07.79, 38.01, 38.11, 38.31, 38.41, 38.51, 38.61, 38.81, 39.28	Only if ventricular shunt or similar implanted
NHSN-CSEC	Cesarean section	Obstetrical delivery by Cesarean section	74.0, 74.1, 74.2, 74.4, 74.91, 74.99	No
NHSN-FUSN	Spinal fusion	Immobilisation of spinal column	81.00-81.08	Yes
NHSN-FX	Open reduction of fracture	Open reduction of fracture or dislocation of long bones that requires internal or external fixation; does not include placement of joint prosthesis	79.21, 79.22, 79.25, 79.26, 79.31, 79.32, 79.35, 79.36, 79.51, 79.52, 79.55, 79.56	Yes, where metalwork inserted.

NHSN code	Operative procedure	Description	ICD-9-CM Codes	90 day surveillance
NHSN-GAST	Gastric surgery	Incision or excision of stomach; includes subtotal or total gastrectomy; does not include vagotomy and fundoplication	43.0, 43.42, 43.49, 43.5, 43.6, 43.7, 43.81, 43.89, 43.91, 43.99, 44.15, 44.21, 44.29, 44.31, 44.38 - 44.42, 44.49, 44.5, 44.61-44.65, 44.68-44.69, 44.95-44.98	No
NHSN-HER	Herniorrhaphy	Repair of inguinal, femoral, umbilical, or anterior abdominal wall hernia; does not include repair of diaphragmatic or hiatal hernia or hernias at other body sites.	17.11-17.13, 17.21-17.24, 53.00 - 53.05, 53.10-53.17, 53.21, 53.29, 53.31, 53.39, 53.41-53.43, 53.49, 53.51, 53.59, 53.61-53.63, 53.69	Only if mesh or non resorbable prosthetic material inserted
NHSN-HPRO	Hip prosthesis	Arthroplasty of hip	00.70-00.73, 00.85-00.87, 81.51 - 81.53	Yes
NHSN-HTP	Heart transplant	Transplantation of heart	37.51-37.55	No
NHSN-HYST	Abdominal hysterectomy	Removal of uterus through an abdominal incision	68.31, 68.39, 68.41, 68.49, 68.61, 68.69	No
NHSN-KPRO	Knee prosthesis	Arthroplasty of knee	00.80-00.84, 81.54, 81.55	Yes
NHSN-KTP	Kidney transplant	Transplantation of kidney	55.61, 55.69	No
NHSN-LAM	Laminectomy	Exploration or decompression of spinal cord through excision or incision into vertebral structures	03.01, 03.02, 03.09, 80.50, 80.51, 80.53, 80.54**,** 80.59, 84.60-84.69, 84.80-84.85	No
NHSN-LTP	Liver transplant	Transplantation of liver	50.51, 50.59	No
NHSN-NECK	Neck surgery	Major excision or incision of the larynx and radical neck dissection; does not include thyroid and parathyroid operations.	30.1, 30.21, 30.22, 30.29, 30.3, 30.4, 31.45, 40.40-40.42	No
NHSN-NEPH	Kidney surgery	Resection or manipulation of the kidney with or without removal of related structures	55.01-55.02, 55.11, 55.12, 55.24, 55.31, 55.32, 55.34, 55.35, 55.39, 55.4, 55.51, 55.52, 55.54, 55.91	No

NHSN code	Operative procedure	Description	ICD-9-CM Codes	90 day surveillance
NHSN-OVRY	Ovarian surgery	Operations on ovary and related structures	65.01, 65.09, 65.12, 65.13, 65.2165.25, 65.29, 65.31, 65.39, 65.41, 65.49, 65.51-65.54, 65.61-65.64, 65.71-65.76, 65.79, 65.81, 65.89, 65.92-65.95, 65.99	No
NHSN-PACE	Pacemaker surgery	Insertion, manipulation or replacement of pacemaker	00.50-00.54, 17.51, 17.52, 37.7037.77, 37.79-37.83, 37.85-37.87, 37.89, 37.94-37.99	Yes for pacemaker or ICD device insertion.
NHSN-PRST	Prostate surgery	Suprapubic, retropubic, radical, or perineal excision of the prostate; does not include transurethral resection of the prostate.	60.12, 60.3, 60.4, 60.5, 60.61, 60.62, 60.69	No
NHSN-PVBY	Peripheral vascular bypass surgery	Bypass operations on peripheral arteries	39.29	If non human vascular graft in place
NHSN-REC	Rectal surgery	Operations on rectum	48.25, 48.35, 48.40, 48.42, 48.43, 48.49-48.52, 48.59, 48.61-48.65, 48.69, 48.74	No
NHSN-RFUSN	Refusion of spine	Refusion of spine	81.30-81.39	
NHSN-SB	Small bowel surgery	Incision or resection of the small intestine; does not include small-to-large bowel anastomosis.	45.01, 45.02, 45.15, 45.31-45.34, 45.51, 45.61-45.63, 45.91, 46.01, 46.02, 46.20-46.24, 46.31, 46.39, 46.41, 46.51, 46.71-46.74, 46.93	No
NHSN-SPLE	Spleen surgery	Resection or manipulation of spleen	41.2, 41.33, 41.41-41.43, 41.5, 41.93, 41.95, 41.99	No

NHSN code	Operative procedure	Description	ICD-9-CM Codes	90 day surveillance
NHSN-THOR	Thoracic surgery	Noncardiac, nonvascular thoracic surgery; includes pneumonectomy and diaphragmatic or hiatal hernia repair.	32.09, 32.1, 32.20, 32.21-32.23, 32.25, 32.26, 32.29, 32.30, 32.39, 32.41, 32.49, 32.50, 32.59, 32.6, 32.9, 33.0, 33.1, 33.20, 33.25, 33.28, 33.31-33.34, 33.39, 33.41 - 33.43, 33.48, 33.49, 33.98, 33.99, 34.01-34.03, 34.06, 34.1, 34.20, 34.26, 34.3, 34.4, 34.51, 34.52, 34.59, 34.6, 34.81-34.84, 34.89, 34.93, 34.99, 53.80-53.84	No, unless mesh inserted.
NHSN-THYR	Thyroid and/or parathyroid surgery	Resection or manipulation of thyroid and/or parathyroid	06.02, 06.09, 06.12, 06.2, 06.31, 06.39, 06.4, 06.50-06.52, 06.6, 06.7, 06.81, 06.89, 06.91-06.95, 06.98, 06.99	No
NHSN-VHYS	Vaginal hysterectomy	Vaginal hysterectomy; includes that by laparoscope	68.51, 68.59, 68.71, 68.79	No
NHSN-VSHN	Ventricular shunt	Ventricular shunt operations, including revision and removal of shunt	02.2, 02.31-02.35, 02.39, 02.42, 02.43, 54.95^	Yes
NHSN-XLAP	Exploratory laparotomy	Procedures involving an incision through abdominal wall to gain access into the abdominal cavity; diagnostic procedure on abdominal region	53.71-53.72, 53.75, 54.0, 54.11, 54.12, 54.19, 54.3, 54.4, 54.51, 54.59, 54.61, 54.63, 54.64, 54.7154.75, 54.92, 54.93	No

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McCabe score

Classification of the severity of underlying medical conditions. Disregard the influence of acute infections, eg, if the patient has an active HAI, estimate the score the patient had before the infection. Answer categories: non-fatal disease (expected survival at least five years); ultimately fatal disease (between one and five years); rapidly fatal disease (expected death within one year); unknown.

Although the prognosis of diseases varies in time and between hospitals due to changes in treatment options and their availability, using McCabe scores can still be helpful. Some examples of diseases and their different McCabe score categories are given below. These examples, in particular those of the second (ultimately fatal) category, are not meant to be exhaustive but rather to serve as a guidance tool for the current protocol.

Examples of diseases for different McCabe score categories:

Rapidly fatal: < one year

- end-stage haematological malignancies (unsuitable for transplant, or relapsed), heart failure (EF < 25%) and end-stage liver disease (unsuitable for transplant with recalcitrant ascites, encephalopathy or varices)
- multiple organ failure on intensive care unit – APACHE II score > 30, SAPS II score > 70
- pulmonary disease with cor pulmonale

Ultimately fatal: One year to four years

- chronic leukaemias, myelomas, lymphomas, metastatic carcinoma, end-stage kidney disease (without transplant)
- motor neuron disease, multiple sclerosis non-responsive to treatment
- Alzheimer's/dementia
- diabetes requiring amputation or post amputation

Non fatal: > five years

- diabetes
- carcinoma/haematological malignancy with > 80% five-year survival
- inflammatory disorders
- chronic GI, GU conditions
- obstetrics
- infections (including HIV, HCV, HBV – unless in above categories)
- all other diseases

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Antimicrobials

The doses of the antimicrobials should be marked in milligrammes, mg (grammes, g x1000).

Antimicrobial generic name	ATC5
Amikacin	J01GB06
Amoxicillin	J01CA04
Amoxicillin and enzyme inhibitor	J01CR02
Amphotericin B (oral)	A07AA07
Amphotericin B (parenteral)	J02AA01
Ampicillin	J01CA01
Ampicillin and enzyme inhibitor	J01CR01
Ampicillin, combinations	J01CA51
Anidulafungin	J02AX06
Arbekacin	J01GB12
Aspoxicillin	J01CA19
Azanidazole	P01AB04
Azidocillin	J01CE04
Azithromycin	J01FA10
Azlocillin	J01CA09
Aztreonam	J01DF01
Bacampicillin	J01CA06
Bacitracin	J01XX10
Bekanamycin	J01GB13
Benzathine benzylpenicillin	J01CE08
Benzathine phenoxymethylpenicillin	J01CE10
Benzylpenicillin	J01CE01
Biapenem	J01DH05
Brodimoprim	J01EA02
Carbenicillin	J01CA03
Carindacillin	J01CA05
Carumonam	J01DF02
Caspofungin	J02AX04
Cefacetrile	J01DB10
Cefaclor	J01DC04
Cefadroxil	J01DB05
Cefalexin	J01DB01
Cefaloridine	J01DB02
Cefalotin	J01DB03
Cefamandole	J01DC03
Cefapirin	J01DB08
Cefatrizine	J01DB07

Antimicrobial generic name	ATC5
Cefazedone	J01DB06
Cefazolin	J01DB04
Cefbuperazone	J01DC13
Cefcapene	J01DD17
Cefdinir	J01DD15
Cefditoren	J01DD16
Cefepime	J01DE01
Cefetamet	J01DD10
Cefixime	J01DD08
Cefmenoxime	J01DD05
Cefmetazole	J01DC09
Cefminox	J01DC12
Cefodizime	J01DD09
Cefonicide	J01DC06
Cefoperazone	J01DD12
Cefoperazone, combinations	J01DD62
Ceforanide	J01DC11
Cefotaxime	J01DD01
Cefotetan	J01DC05
Cefotiam	J01DC07
Cefoxitin	J01DC01
Cefozopran	J01DE03
Cefpiramide	J01DD11
Cefpirome	J01DE02
Cefpodoxime	J01DD13
Cefprozil	J01DC10
Cefradine	J01DB09
Cefroxadine	J01DB11
Cefsulodin	J01DD03
Ceftaroline fosamil	J01DI02
Ceftazidime	J01DD02
Ceftezole	J01DB12
Ceftibuten	J01DD14
Ceftizoxime	J01DD07
Ceftobiprole medocaril	J01DI01
Ceftriaxone	J01DD04
Ceftriaxone, combinations	J01DD54
Cefuroxime	J01DC02
Cefuroxime, combinations with other antibacterials	J01RA03
Chloramphenicol	J01BA01
Chlortetracycline	J01AA03

Antimicrobial generic name	ATC5
Cinoxacin	J01MB06
Ciprofloxacin	J01MA02
Clarithromycin	J01FA09
Clindamycin	J01FF01
Clofoctol	J01XX03
Clometocillin	J01CE07
Clomocycline	J01AA11
Cloxacillin	J01CF02
Colistin (injection, infusion)	J01XB01
Colistin (oral)	A07AA10
Combinations of beta-lactamase sensitive penicillins	J01CE30
Combinations of intermediate-acting sulphonamides	J01EC20
Combinations of long-acting sulphonamides	J01ED20
Combinations of penicillins	J01CR50
Combinations of penicillins with extended spectrum	J01CA20
Combinations of short-acting sulphonamides	J01EB20
Combinations of tetracyclines	J01AA20
Dalbavancin	J01XA04
Daptomycin	J01XX09
Demeclocycline	J01AA01
Dibekacin	J01GB09
Dicloxacillin	J01CF01
Dirithromycin	J01FA13
Doripenem	J01DH04
Doxycycline	J01AA02
Enoxacin	J01MA04
Epicillin	J01CA07
Ertapenem	J01DH03
Erythromycin	J01FA01
Ethambutol	J04AK02
Fidaxomicin	A07AA12
Fleroxacin	J01MA08
Flomoxef	J01DC14
Flucloxacillin	J01CF05
Fluconazole	J02AC01
Flucytosine	J02AX01
Flumequine	J01MB07
Flurithromycin	J01FA14
Fosfomycin	J01XX01
Fusidic acid	J01XC01
Garenoxacin	J01MA19

Antimicrobial generic name	ATC5
Gatifloxacin	J01MA16
Gemifloxacin	J01MA15
Gentamicin	J01GB03
Grepafloxacin	J01MA11
Griseofulvin	D01BA01
Hachimycin	J02AA02
Hetacillin	J01CA18
Idaprim	J01EA03
Imipenem and enzyme inhibitor	J01DH51
Isepamicin	J01GB11
Isoniazid	J04AC01
Itraconazole	J02AC02
Josamycin	J01FA07
Kanamycin	A07AA08
Kanamycin	J01GB04
Ketoconazole	J02AB02
Latamoxef	J01DD06
Levofloxacin	J01MA12
Lincomycin	J01FF02
Linezolid	J01XX08
Lomefloxacin	J01MA07
Loracarbef	J01DC08
Lymecycline	J01AA04
Mandelic acid	J01XX06
Mecillinam	J01CA11
Meropenem	J01DH02
Metacycline	J01AA05
Metampicillin	J01CA14
Methenamine	J01XX05
Meticillin	J01CF03
Metronidazole (oral, rectal)	P01AB01
Metronidazole (parenteral)	J01XD01
Mezlocillin	J01CA10
Micafungin	J02AX05
Miconazole	J02AB01
Midecamycin	J01FA03
Minocycline	J01AA08
Miocamycin	J01FA11
Moxifloxacin	J01MA14
Nafcillin	J01CF06
Nalidixic acid	J01MB02

Antimicrobial generic name	ATC5
Natamycin	A07AA03
Neomycin (injection, infusion)	J01GB05
Neomycin (oral)	A07AA01
Neomycin, combinations (oral)	A07AA51
Netilmicin	J01GB07
Nifurtoinol	J01XE02
Nimorazole	P01AB06
Nitrofurantoin	J01XE01
Nitroxoline	J01XX07
Norfloxacin	J01MA06
Nystatin	A07AA02
Ofloxacin	J01MA01
Oleandomycin	J01FA05
Oritavancin	J01XA05
Ornidazole (oral)	P01AB03
Ornidazole (parenteral)	J01XD03
Oxacillin	J01CF04
Oxolinic acid	J01MB05
Oxytetracycline	J01AA06
Oxytetracycline, combinations	J01AA56
Panipenem and betamipron	J01DH55
Paromomycin	A07AA06
Pazufloxacin	J01MA18
Pefloxacin	J01MA03
Penamecillin	J01CE06
Penicillins, combinations with other antibacterials	J01RA01
Penimepicycline	J01AA10
Pheneticillin	J01CE05
Phenoxymethylpenicillin	J01CE02
Pipemidic acid	J01MB04
Piperacillin	J01CA12
Piperacillin and enzyme inhibitor	J01CR05
Piromidic acid	J01MB03
Pivampicillin	J01CA02
Pivmecillinam	J01CA08
Polymyxin B	A07AA05
Polymyxin B	J01XB02
Posaconazole	J02AC04
Pristinamycin	J01FG01
Procaine benzylpenicillin	J01CE09
Propenidazole	P01AB05

Antimicrobial generic name	ATC5
Propicillin	J01CE03
Prulifloxacin	J01MA17
Pyrazinamide	J04AK01
Quinupristin/dalfopristin	J01FG02
Ribostamycin	J01GB10
Rifabutin	J04AB04
Rifampicin	J04AB02
Rifaximin	A07AA11
Rokitamycin	J01FA12
Rolitetracycline	J01AA09
Rosoxacin	J01MB01
Roxithromycin	J01FA06
Rufloxacin	J01MA10
Secnidazole	P01AB07
Sisomicin	J01GB08
Sitafloxacin	J01MA21
Sparfloxacin	J01MA09
Spectinomycin	J01XX04
Spiramycin	J01FA02
Spiramycin, combinations with other antibacterials	J01RA04
Streptoduocin	J01GA02
Streptomycin (oral)	A07AA04
Streptomycin (parenteral)	J01GA01
Streptomycin, combinations	A07AA54
Sulbactam	J01CG01
Sulbenicillin	J01CA16
Sulfadiazine	J01EC02
Sulfadiazine and tetroxoprim	J01EE06
Sulfadiazine and trimethoprim	J01EE02
Sulfadimethoxine	J01ED01
Sulfadimidine	J01EB03
Sulfadimidine and trimethoprim	J01EE05
Sulfafurazole	J01EB05
Sulfaisodimidine	J01EB01
Sulfalene	J01ED02
Sulfamazone	J01ED09
Sulfamerazine	J01ED07
Sulfamerazine and trimethoprim	J01EE07
Sulfamethizole	J01EB02
Sulfamethoxazole	J01EC01
Sulfamethoxazole and trimethoprim	J01EE01

Antimicrobial generic name	ATC5
Sulfamethoxypyridazine	J01ED05
Sulfametomidine	J01ED03
Sulfametoxydiazine	J01ED04
Sulfametrole and trimethoprim	J01EE03
Sulfamoxole	J01EC03
Sulfamoxole and trimethoprim	J01EE04
Sulfanilamide	J01EB06
Sulfaperin	J01ED06
Sulfaphenazole	J01ED08
Sulfapyridine	J01EB04
Sulfathiazole	J01EB07
Sulfathiourea	J01EB08
Sulfonamides, combinations with other antibacterials (excl. trimethoprim)	J01RA02
Sultamicillin	J01CR04
Talampicillin	J01CA15
Tazobactam	J01CG02
Teicoplanin	J01XA02
Telavancin	J01XA03
Telithromycin	J01FA15
Temafloxacin	J01MA05
Temocillin	J01CA17
Terbinafine	D01BA02
Tetracycline	J01AA07
Thiamphenicol	J01BA02
Thiamphenicol, combinations	J01BA52
Ticarcillin	J01CA13
Ticarcillin and enzyme inhibitor	J01CR03
Tigecycline	J01AA12
Tinidazole (oral, rectal)	P01AB02
Tinidazole (parenteral)	J01XD02
Tobramycin	J01GB01
Trimethoprim	J01EA01
Troleandomycin	J01FA08
Trovafloxacin	J01MA13
Vancomycin (oral)	A07AA09
Vancomycin (parenteral)	J01XA01
Voriconazole	J02AC03
Xibornol	J01XX02

Infection site code list for antimicrobial use

These are the diagnosis codes that are reported as being treated either in the medical/nursing or pharmacy record for the infection. It is NOT a case definition.

Diagnosis	Examples
CNS	Infections of the central nervous system
EYE	Endophthalmitis
ENT	Infections of ear, nose, throat, larynx and mouth
BRON	Acute bronchitis or exacerbations of chronic bronchitis
PNEU	Pneumonia
CF	Cystic fibrosis
CVS	Cardiovascular infections: endocarditis, vascular graft
GI	Gastrointestinal infections (eg salmonellosis, antibiotic-associated diarrhoea)
IA	Intra-abdominal sepsis, including hepatobiliary
SST-SSI	Surgical site infection involving skin or soft tissue but not bone
SST-O	Cellulitis, wound, deep soft tissue not involving bone, not related to surgery
BJ-SSI	Septic arthritis, osteomyelitis of surgical site
BJ-O	Septic arthritis, osteomyelitis, not related to surgery
CYS	Symptomatic lower urinary tract infection (eg cystitis)
PYE	Symptomatic upper urinary tract infection (eg pyelonephritis)
ASB	Asymptomatic bacteriuria
OBGY	Obstetric or gynaecological infections, STD in women
GUM	Prostatitis, epididymo-orchitis, STD in men
BAC	Laboratory-confirmed bacteraemia
CSEP	Clinical sepsis (suspected bloodstream infection without lab confirmation/results are not available, no blood cultures collected or negative blood culture), excluding febrile neutropenia
FN	Febrile neutropenia or other form of manifestation of infection in immunocompromised host (eg HIV, chemotherapy, etc) with no clear anatomical site
SIRS	Systemic inflammatory response with no clear anatomical site
UND	Completely undefined; site with no systemic inflammation
NA	Not applicable; for antimicrobial use other than treatment

Indications for antimicrobial use

These are the indication for antibiotic use. It is NOT a case definition but related to the reason the prescriber prescribed the antibiotic. Please ask nurses or doctors if not clear from the medical record.

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)

*** Check if given from 8:00am day before until 8:00am on PPS day – if yes, check if given on day before yesterday or on day of the survey to determine duration**

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HAI definitions

Definition of active HAI

Onset of HAI[1]		**Case definition**
Day 3 onwards	**AND**	Meets the case definition on the day of survey.
OR		
Day 1 (day of admission) or Day 2: SSI criteria met at any time after admission (including previous surgery 30 days/90 days).		
OR		OR
Day 1 or Day 2 AND patient discharged from acute-care hospital in preceding 48 hours.		
OR		
Day 1 or Day 2 AND patient discharged from acute-care hospital in preceding 28 days if CDI[2] present.		Patient is receiving treatment[3] AND HAI has previously met the case definition between Day 1 of treatment and survey day.
OR		
Day 1 or Day 2 AND patient has relevant device inserted on this admission prior to onset.		

[1] Date of onset of HAI: date of first signs or symptoms of the infection; if unknown, record the date when treatment was started for this infection or the date the first diagnostic sample was taken. If no treatment or sample, please estimate. Not to be recorded if signs/symptoms are present at admission.

[2] CDI: *C. difficile* infection

[3] Any kind of treatment, not necessarily antimicrobial.

HAI case definition codes, overview

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

UTI	**Urinary tract infection***
UTI-A	Microbiologically confirmed symptomatic UTI
UTI-B	Not microbiologically confirmed symptomatic UTI

** Asymptomatic bacteriuria are not within the scope of the PPS*

BSI	**Bloodstream infection (lab confirmed)**
Source of BSI:	
C-CVC	Central vascular catheter (note: report as CRI3 if microbiological criteria are met)
C-PVC	Peripheral vascular catheter (note: report as CRI3 if microbiological criteria are met)
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

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

GI	**Gastrointestinal system infections**
CDI	*Clostridium difficile* infection
GE	Gastroenteritis (excluding CDI)
GIT	Gastrointestinal tract (esophagus, stomach, small and large bowel, and rectum), excluding GE, CDI
HEP	Hepatitis
IAB	Intra-abdominal, not specified elsewhere

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

REPR	**Reproductive tract infections**
EMET	Endometritis
EPIS	Episiotomy
VCUF	Vaginal cuff
OREP	Other infections of the male or female reproductive tract

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, 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

SYS	**Systemic infections**
DI	Disseminated infection
CSEP	Clinical sepsis 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

A single-case definition code should only be provided once per patient (no different infection episodes). For example: pneumonia: PN1> PN2> PN3> PN4> PN5; urinary tract infections: UTI-A> UTI-B); laboratory-confirmed bloodstream infections, provide only one of BSI, CRI3 (priority CRI3> BSI), NEO-LCBI or NEO-CNSB (priority NEO-LCBI> NEO-CNSB [> BSI]).

HAI code list, table

HAI code	HAI label
SSI-S	Surgical site infection, superficial incisional
SSI-D	Surgical site infection, deep incisional
SSI-O	Surgical site infection, organ/space
PN1	Pneumonia, clinical + positive quantitative culture from minimally contaminated lower respiratory tract specimen
PN2	Pneumonia, clinical + positive quantitative culture from possibly contaminated lower respiratory tract specimen
PN3	Pneumonia, clinical + microbiological diagnosis by alternative microbiology methods
PN4	Pneumonia, clinical + positive sputum culture or non-quantitative culture from lower respiratory tract specimen
PN5	Pneumonia: clinical signs of pneumonia without positive microbiology
UTI-A	Symptomatic urinary tract infection, microbiologically confirmed
UTI-B	Symptomatic urinary tract infection, not microbiologically confirmed
BSI	Bloodstream infection (laboratory-confirmed), other than CRI3
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 bloodstream infection
CRI1-PVC	Local PVC-related infection (no positive blood culture)
CRI2-PVC	General PVC-related infection (no positive blood culture)
CRI3-PVC	Microbiologically confirmed PVC-related bloodstream infection
BJ-BONE	Osteomyelitis
BJ-JNT	Joint or bursa
BJ-DISC	Disc-space infection
CNS-IC	Intracranial infection
CNS-MEN	Meningitis or ventriculitis
CNS-SA	Spinal abscess without meningitis
CVS-VASC	Arterial or venous infection
CVS-ENDO	Endocarditis
CVS-CARD	Myocarditis or pericarditis
CVS-MED	Mediastinitis
EENT-CONJ	Conjunctivitis
EENT-EYE	Eye, other than conjunctivitis
EENT-EAR	Ear mastoid

HAI code	HAI label
EENT-ORAL	Oral cavity (mouth, tongue, or gums)
EENT-SINU	Sinusitis
EENT-UR	Upper respiratory tract, pharyngitis, laryngitis, epiglottitis
LRI-BRON	Bronchitis, tracheobronchitis, bronchiolitis, tracheitis, without evidence of pneumonia
LRI-LUNG	Other infections of the lower respiratory tract
GI-CDI	*Clostridium difficile* infection
GI-GE	Gastroenteritis (excluding CDI)
GI-GIT	Gastrointestinal tract (esophagus, stomach, small and large bowel, and rectum), excluding GE, CDI
GI-HEP	Hepatitis
GI-IAB	Intra-abdominal infection, not specified elsewhere
REPR-EMET	Endometritis
REPR-EPIS	Episiotomy
REPR-VCUF	Vaginal cuff
REPR-OREP	Other infections of the male or female reproductive tract
SST-SKIN	Skin infection
SST-ST	Soft tissue (necrotizing fascitis, infectious gangrene, necrotizing cellulitis, infectious myositis, lymphadenitis, or lymphangitis)
SST-DECU	Decubitus ulcer, including both superficial and deep infections
SST-BURN	Burn
SST-BRST	Breast abscess or mastitis
SYS-DI	Disseminated infection
SYS-CSEP	Clinical sepsis in adults and children
NEO-CSEP	Clinical sepsis in neonates
NEO-LCBI	Laboratory-confirmed bloodstream infection in neonates, non-CNS
NEO-CNSB	Laboratory-confirmed bloodstream infection with coagulase-negative staphylococci in neonates
NEO-PNEU	Pneumonia in neonates
NEO-NEC	Necrotising enterocolitis

HAI definitions for common conditions

Flowcharts to aid diagnosis have also been created for the most commonly reported HAIs: please refer to the Data Collection Forms and Flowchats document.

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:

- purulent drainage with or without laboratory confirmation, from the superficial incision
- organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision
- 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
- diagnosis of superficial incisional SSI made by a surgeon or attending physician

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 (eg fascia, muscle) of the incision and at least one of the following:

- purulent drainage from the deep incision but not from the organ/space component of the surgical site
- 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 (> 38 °C), localised pain or tenderness, unless incision is culture-negative
- an abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination
- diagnosis of deep incisional SSI made by a surgeon or attending physician

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 (eg organs and spaces) other than the incision which was opened or manipulated during an operation, and at least one of the following:

- purulent drainage from a drain that is placed through a stab wound into the organ/space
- organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space

- 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
- diagnosis of organ/space SSI made by a surgeon or attending physician

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 culture, that is, ≥ 10^5 microorganisms per ml of urine with no more than two species of microorganisms.

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:

- positive dipstick for leukocyte esterase and/or nitrate
- pyuria urine specimen with ≥ 10 WBC/ml or ≥ 3 WBC/high-power field of unspun urine
- organisms seen on Gram stain of unspun urine
- at least two urine cultures with repeated isolation of the same uropathogen (gram-negative bacteria or *S. saprophyticus*) with ≥ 10^2 colonies/ml urine in nonvoided specimens
- ≤ 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
- physician diagnosis of a urinary tract infection
- physician institutes appropriate therapy for a urinary infection

Asymptomatic bacteriuria are not to be reported, but **bloodstream infections secondary to asymptomatic bacteriuria <u>are reported</u> as BSI with source (origin) S-UTI.**

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PN: PNEUMONIA (includes VAP)

XR

Two or more serial chest x-rays or CT-scans with a suggestive image of pneumonia for patients with underlying cardiac or pulmonary disease, [One definitive chest X-ray or CT-scan for the current pneumonia episode may be sufficient in patients with underlying cardiac or pulmonary disease if comparison with previous X-rays is possible] and
at least one of the following (in patients without underlying cardiac or pulmonary disease one definitive chest x-ray or CT-scan is sufficient):

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 dyspnea or tachypnea
- suggestive auscultation (rales or bronchial breath sounds), ronchi, wheezing;
- worsening gas exchange (eg O_2 desaturation or increased oxygen requirements or increased ventilation demand)

and according to the used diagnostic method:
a) Bacteriologic diagnostic test performed by:

Microbiology

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

- broncho-alveolar lavage (BAL) with a threshold of > 10^4 CFU[1]/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 (eg 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 germs (*Legionella*, *Aspergillus*, mycobacteria, mycoplasma, *Pneumocystis carinii*)
- 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 (eg influenza viruses, *Legionella*, *Chlamydia*)
- detection of antigens in urine (*Legionella*)

c) Others: positive sputum culture or non-quantitative LRT specimen culture **(PN 4)**; no positive microbiology **(PN 5)**.

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[1] Colony-forming units

Notes**:**
Intubation-associated pneumonia (IAP)
A pneumonia is defined as intubation-associated (IAP) if an invasive respiratory device was present (even intermittently) in the 48 hours preceding the onset of infection.

PN1 and PN2 criteria were validated without previous antimicrobial therapy. However, this does not exclude the diagnosis of PN1 or PN2 in case of previous antimicrobial use.

Comment: The subdivision of the pneumonia definition in five categories allows for the comparison of similar entities of pneumonia within and between countries. It is essential that all hospitals report PN4 and PN5 (clinical pneumonia without microbiological evidence) when appropriate in order to achieve overall comparability, even if a microbiological exam was performed and yielded negative results. It is also advised, both for clinical and surveillance purposes, that networks promote as microbiological confirmation (PN1–3) as a routine practice, at least in the ICU.

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LRI: LOWER RESPIRATORY TRACT INFECTION, OTHER THAN PNEUMONIA

LRI-BRON: bronchitis, tracheobronchitis, bronchiolitis, tracheitis, without evidence of pneumonia

Tracheobronchial infections must meet at least one of 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:
  - positive culture obtained by deep tracheal aspirate or bronchoscopy
  - positive antigen test on respiratory secretions

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:

- patient has organisms seen on smear or cultured from lung tissue or fluid, including pleural fluid
- patient has a lung abscess or empyema seen during a surgical operation or histopathologic examination
- patient has an abscess cavity seen on radiographic examination of lung

Reporting instructions: Report lung abscess or empyema without pneumonia as LUNG.

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BSI: BLOODSTREAM INFECTION

Laboratory-confirmed

One positive blood culture for a recognised pathogen
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 (from two separate blood samples, usually within 48 hours).

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

Note**:** for neonates (baby <28 days old) one CNS from blood culture may be sufficient – see NEO-CNSB.

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)

Unknown 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. (See also AJIC, 1997;25:112-6).
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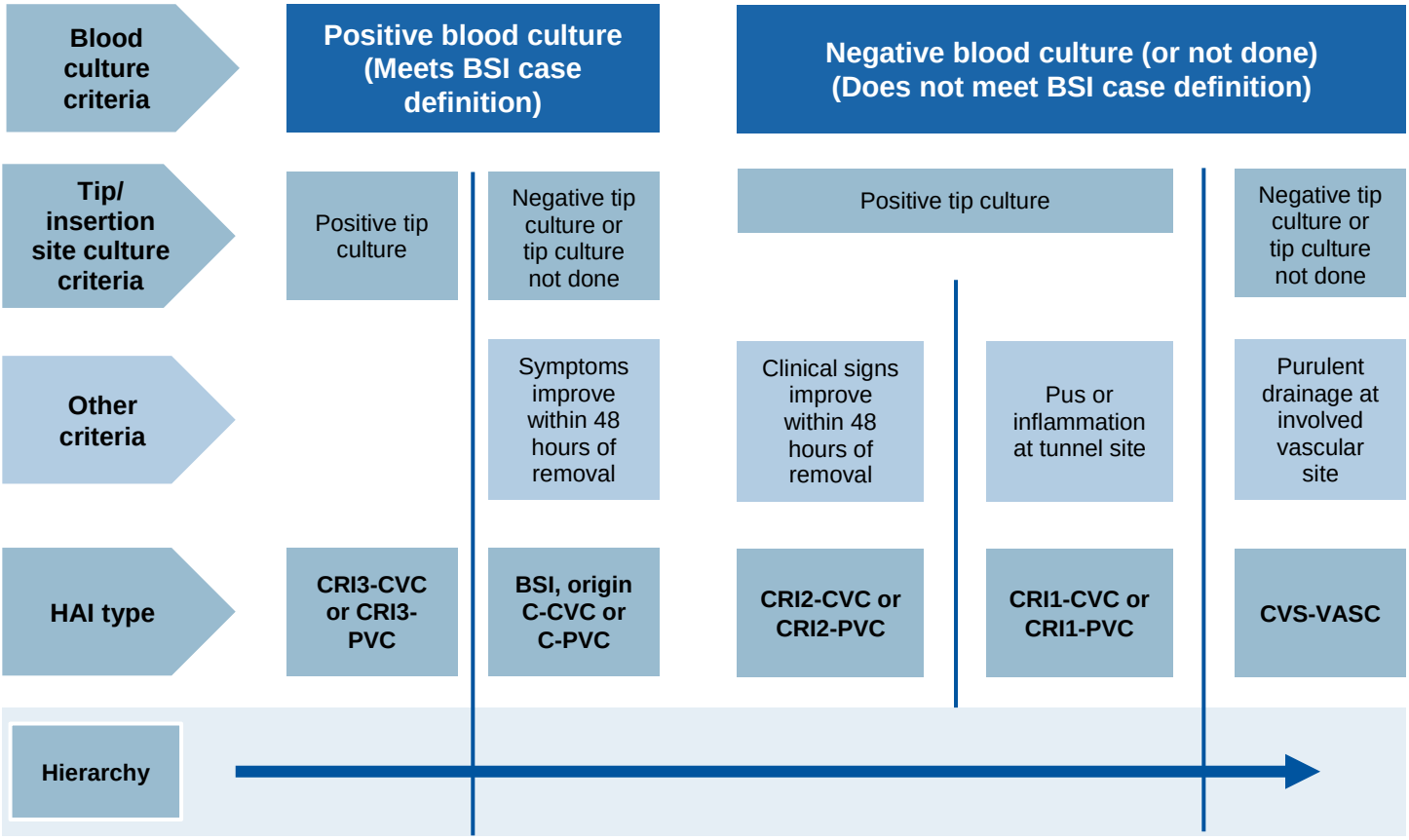
CRI: CATHETER-RELATED INFECTION

Central vascular catheter or peripheral vascular catheter infections

Notes**:**
CVC=central vascular catheter; PVC=peripheral vascular catheter.
Central vascular catheter colonisation should not be reported.
A CRI3 (-CVC or -PVC) is also a bloodstream infection with source C-CVC or C-PVC, respectively. However, when a CRI3 is reported, the BSI should not be reported in the point prevalence survey; microbiologically confirmed catheter-related BSI should be reported as CRI3.



Only one infection of the above can be reported for each device.

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

Quantitative CVC culture ≥ 10^3 CFU/ml or semi-quantitative CVC culture > 15 CFU
and
pus/inflammation at the insertion site or tunnel.

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

Quantitative PVC culture ≥ 10^3 CFU/ml or semi-quantitative PVC culture > 15 CFU
and
pus/inflammation at the insertion site or tunnel.

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

Quantitative CVC culture ≥ 10^3 CFU/ml or semi-quantitative CVC culture > 15 CFU
and
clinical signs improve within 48 hours after catheter removal.

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

Quantitative PVC culture ≥ 10^3 CFU/ml or semi-quantitative PVC culture > 15 CFU
and
clinical signs improve within 48 hours after catheter removal.

CRI3-CVC: microbiologically confirmed CVC-related bloodstream infection

BSI occurring 48 hours before or after catheter removal
and
positive culture with the same microorganism of either:

- quantitative CVC culture ≥ 10^3 CFU/ml or semi-quantitative CVC culture > 15 CFU
- quantitative blood culture ratio CVC blood sample/peripheral blood sample > 5
- differential delay of positivity of blood cultures: CVC blood sample culture positive two hours or more before peripheral blood culture (blood samples drawn at the same time)
- positive culture with the same microorganism from pus from insertion site

CRI3-PVC: microbiologically confirmed PVC-related bloodstream infection

BSI occurring 48 hours before or after catheter removal
and
positive culture with the same microorganism of either:

- quantitative PVC culture ≥ 10^3 CFU/ml or semi-quantitative PVC culture > 15 CFU
- positive culture with the same microorganism from pus from insertion site

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CVS: CARDIOVASCULAR SYSTEM INFECTION

CVS-VASC: arterial or venous infection

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

- patient has organisms cultured from arteries or veins removed during a surgical operation and blood culture not done or no organisms cultured from blood
- patient has evidence of arterial or venous infection seen during a surgical operation or histopathologic examination
- patient has at least one of the following signs or symptoms with no other recognised cause: fever (> 38°C), pain, erythema, or heat at involved vascular site,
  and
  more than 15 colonies cultured from intravascular cannula tip using semiquantitative culture method,
  and
  blood culture not done or no organisms cultured from blood.
- patient has purulent drainage at involved vascular site,
  and
  blood culture not done or no organisms cultured from blood

Reporting instructions: Report infections of an arteriovenous graft, shunt, or fistula, or intravascular cannulation site without organisms cultured from blood as CVS-VASC.

CVS-ENDO: endocarditis

Endocarditis of a natural or prosthetic heart valve must meet at least one of the following criteria:

- patient has organisms cultured from valve or vegetation
- patient has two or more of the following signs or symptoms with no other recognised cause: fever (> 38°C), new or changing murmur, embolic phenomena, skin manifestations (i.e. petechiae, splinter haemorrhages, painful subcutaneous nodules), congestive heart failure, or cardiac conduction abnormality, and at least one of the following:
  - organisms cultured from two or more blood cultures
  - organisms seen on Gram's stain of valve when culture is negative or not done
  - valvular vegetation seen during a surgical operation or autopsy
  - positive antigen test on blood or urine (e.g. *H. influenzae*, *S. pneumoniae*, *N. meningitidis*, or Group B *Streptococcus*)
  - evidence of new vegetation seen on echocardiogram
    and,
    if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy

CVS-CARD: myocarditis or pericarditis

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

- patient has organisms cultured from pericardial tissue or fluid obtained by needle aspiration or during a surgical operation
- patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C), chest pain, paradoxical pulse, or increased heart size,
  and
  at least one of the following:
  - abnormal ECG/EKG consistent with myocarditis or pericarditis
  - positive antigen test on blood (e.g. *H. influenzae*, *S. pneumoniae*)
  - evidence of myocarditis or pericarditis on histologic examination of heart tissue
  - fourfold rise in type-specific antibody with or without isolation of virus from pharynx or feces
  - pericardial effusion identified by echocardiogram, CT scan, MRI, or angiography

Comment: Most cases of postcardiac surgery or postmyocardial infarction pericarditis are not infectious.

CVS-MED: mediastinitis

Mediastinitis must meet at least one of the following criteria:

- patient has organisms cultured from mediastinal tissue or fluid obtained during a surgical operation or needle aspiration
- patient has evidence of mediastinitis seen during a surgical operation or histopathologic examination
- patient has at least one of the following signs or symptoms with no other recognised cause: fever (> 38°C), chest pain, or sternal instability,
  and
  at least one of the following:
  - purulent discharge from mediastinal area
  - organisms cultured from blood or discharge from mediastinal area
  - mediastinal widening on x-ray

Reporting instruction: Report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as SSI-O.

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GI: GASTROINTESTINAL SYSTEM INFECTION

GI-CDI: clostridium difficile infection

A *Clostridium difficile* infection (previously also referred to as *Clostridium difficile* associated diarrhoea, or CDAD) must meet at least one of the following criterions:

- diarrhoeal stools or toxic megacolon, and a positive laboratory assay for *C. difficile* toxin A and/or B in stools or a toxin-producing *C. difficile* organism detected in stool via culture or other means e.g. a positive PCR result
- pseudomembranous colitis revealed by lower gastro-intestinal endoscopy
- colonic histopathology characteristic of *C. difficile* infection (with or without diarrhoea) on a specimen obtained during endoscopy, colectomy or autopsy

Note: If clinical signs of *Clostridium difficile* infection appear in 28 days after hospital discharge period, GI-CDI must be defined as healthcare-associated infection.

(*) May be community or healthcare associated, depending on case's history. If healthcare associated, may have been acquired in the same facility or imported.

GI-GE: gastroenteritis (excluding CDI)

Gastroenteritis must meet at least one of the following criteria:

- Patient has an acute onset of diarrhoea (liquid stools for more than 12 hours) with or without vomiting or fever (> 38°C) and no likely non-infectious cause (eg diagnostic tests, therapeutic regimen other than antimicrobial agents, acute exacerbation of a chronic condition, or psychological stress)
- Patient has at least two of the following signs or symptoms with no other recognised cause: nausea, vomiting, abdominal pain, fever (> 38°C), or headache,
  and
  at least one of the following:
  - an enteric pathogen is cultured from stool or rectal swab
  - an enteric pathogen is detected by routine or electron microscopy
  - an enteric pathogen is detected by antigen or antibody assay on blood or feces
  - evidence of an enteric pathogen is detected by cytopathic changes in tissue culture (toxin assay)

- diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen

GI-GIT: gastrointestinal tract (esophagus, 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:

- patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination
- 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:
  - organisms cultured from drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
  - organisms seen on Gram's or KOH 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
  - organisms cultured from blood
  - evidence of pathologic findings on radiographic examination
  - evidence of pathologic findings on endoscopic examination (eg *Candida* esophagitis or proctitis)

GI-HEP: hepatitis

Hepatitis must meet the following criterion:

- patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38 °C), anorexia, nausea, vomiting, abdominal pain, jaundice, or history of transfusion within the previous three months,
  and
  at least one of the following:
  - positive antigen or antibody test for hepatitis A, hepatitis B, hepatitis C, or delta hepatitis
  - abnormal liver function tests (eg elevated ALT/AST, bilirubin)
  - cytomegalovirus (CMV) detected in urine or oropharyngeal secretions

Reporting instructions:

- do not report hepatitis or jaundice of non-infectious origin (alpha-1 antitrypsin deficiency, etc)
- do not report hepatitis or jaundice that results from exposure to hepatotoxins (alcoholic or acetaminophen-induced hepatitis, etc)
- do not report hepatitis or jaundice that results from biliary obstruction (cholecystitis)

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

Intra-abdominal infections must meet at least one of the following criteria:

- patient has organisms cultured from purulent material from intra-abdominal space obtained during a surgical operation or needle aspiration
- patient has abscess or other evidence of intra-abdominal infection seen during a surgical operation or histopathologic examination
- patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C), nausea, vomiting, abdominal pain, or jaundice,
  and
  at least one of the following:
  - organisms cultured from drainage from surgically placed drain (eg closed suction drainage system, open drain, T-tube drain)
  - organisms seen on Gram's stain of drainage or tissue obtained during surgical operation or needle aspiration
  - organisms cultured from blood and radiographic evidence of infection, eg abnormal findings on ultrasound, CT scan, MRI, or radiolabel scans (gallium, technetium, etc) or on abdominal x-ray

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

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SST: SKIN AND SOFT TISSUE INFECTION (also SST-BURN & SST-BRST)

SST-SKIN: skin infection

Skin infections must meet at least one of the following criteria:

- patient has purulent drainage, pustules, vesicles, or boils
- patient has at least two of the following signs or symptoms with no other recognised cause: pain or tenderness, localised swelling, redness, or heat,
  and
  at least one of the following:
  - organisms cultured from aspirate or drainage from affected site; if organisms are normal skin flora (ie diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp), they must be a pure culture
  - organisms cultured from blood
  - positive antigen test performed on infected tissue or blood (eg herpes simplex, varicella zoster, *H. influenzae*, *N. meningitidis*)
  - multinucleated giant cells seen on microscopic examination of affected tissue
  - diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen

Reporting instructions

- report infected decubitus ulcers as DECU
- report infected burns as BURN
- report breast abscesses or mastitis as BRST

SST-ST: soft tissue (necrotizing fascitis, infectious gangrene, necrotizing cellulitis, infectious myositis, lymphadenitis, or lymphangitis)

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

- patient has organisms cultured from tissue or drainage from affected site
- patient has purulent drainage at affected site
- patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination
- 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:
  - organisms cultured from blood
  - positive antigen test performed on blood or urine (eg *H. influenzae*, *S. pneumoniae*, *N. meningitidis*, Group B *Streptococcus*, *Candida* spp)

    - diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen

Reporting instructions

- report infected decubitus ulcers as DECU
- report infection of deep pelvic tissues as OREP

SST-DECU: decubitus ulcer, including both superficial and deep infections

Decubitus ulcer infections must meet the following criterion:

- patient has at least two of the following signs or symptoms with no other recognised cause: redness, tenderness, or swelling of decubitus wound edges
  and
  at least one of the following:
    - organisms cultured from properly collected fluid or tissue (see comments below)
    - organisms cultured from blood.

Comments:

- purulent drainage alone is not sufficient evidence of an infection
- organisms cultured from the surface 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-BURN: burn

Burn infections must meet at least one of the following criteria:

- 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 edema at wound margin and histologic examination of burn biopsy shows invasion of organisms into adjacent viable tissue
- 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 edema at wound margin,
  and
  at least one of the following:
    - organisms cultured from blood in the absence of other identifiable infection
    - 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
- patient with a burn has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C) or hypothermia (< 36°C), hypotension, oliguria (< 20 cc/hr), hyperglycemia at previously tolerated level of dietary carbohydrate, or mental confusion,

and

at least one of the following:

- histologic examination of burn biopsy shows invasion of organisms into adjacent viable tissue
- organisms cultured from blood
- 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

Comments:

- purulence alone at the burn wound site is not adequate for the diagnosis of burn infection; such purulence may reflect incomplete wound care
- fever alone in a burn patient is not adequate for the diagnosis of a burn infection because fever may be the result of tissue trauma or the patient may have an infection at another site
- surgeons in regional burn centres who take care of burn patients exclusively may require Criterion 1 for diagnosis of burn infection
- hospitals with regional burn centres may further divide burn infections into the following: burn wound site, burn graft site, burn donor site, burn donor site-cadaver; NHSN, however, will code all of these as BURN

SST-BRST: breast abscess or mastitis

A breast abscess or mastitis must meet at least one of the following criteria:

- patient has a positive culture of affected breast tissue or fluid obtained by incision and drainage or needle aspiration
- patient has a breast abscess or other evidence of infection seen during a surgical operation or histopathologic examination
- patient has fever (> 38°C) and local inflammation of the breast and physician diagnosis of breast abscess.

Comment: Breast abscesses occur most frequently after childbirth. Those that occur within seven days after childbirth should be considered healthcare associated.

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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.

Reporting instructions:

- use this code for viral infections involving multiple organ systems (e.g. measles, mumps, rubella, varicella, erythema infectiosum). These infections often can be identified by clinical criteria alone. Do not use this code for healthcare-associated infections with multiple metastatic sites, such as with bacterial endocarditis; only the primary site of these infections should be reported
- do not report fever of unknown origin (FUO) as DI
- report viral exanthems or rash illness as DI

SYS-CSEP: treated unidentified severe infection (formerly: 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 pressure < 90 mm)
  - or oliguria (20 cm^3(ml)/hr)
    and
  - blood culture not done or no organisms or antigen detected in blood;
    and
  - no apparent infection at another site
  - and
  - physician institutes treatment for sepsis

Reporting instructions:

- do not use this code unless absolutely needed (last-resort definition)
- for CSEP in neonates, use NEO-CSEP case definition (see below)

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Case definitions of other healthcare-associated infections (including for specialist hospitals including paediatric and neonate)

BJ: BONE AND JOINT INFECTION

BJ-BONE: osteomyelitis

Osteomyelitis must meet at least one of the following criteria:

- patient has organisms cultured from bone
- patient has evidence of osteomyelitis on direct examination of the bone during a surgical operation or histopathologic examination;
  patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C), localised swelling, tenderness, heat, or drainage at suspected site of bone infection,
  and
  at least one of the following:
  - organisms cultured from blood
  - positive blood antigen test (eg *H. influenzae, S. pneumoniae*)
  - radiographic evidence of infection, e.g. abnormal findings on x-ray, CT scan, MRI, radiolabel scan (gallium, technetium, etc)

Reporting instructions: report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as 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:

- patient has organisms cultured from joint fluid or synovial biopsy
- patient has evidence of joint or bursa infection seen during a surgical operation or histopathologic examination
- 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:
  - organisms and white blood cells seen on Gram’s stain of joint fluid
  - positive antigen test on blood, urine, or joint fluid

  - cellular profile and chemistries of joint fluid compatible with infection and not explained by an underlying rheumatologic disorder
  - radiographic evidence of infection, eg abnormal findings on x-ray, CT scan, MRI, radiolabel scan (gallium, technetium, etc)

BJ-DISC: disc space infection

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

- patient has organisms cultured from vertebral disc space tissue obtained during a surgical operation or needle aspiration
- patient has evidence of vertebral disc space infection seen during a surgical operation or histopathologic examination
- patient has fever (> 38°C) with no other recognised cause or pain at the involved vertebral disc space
  and
  radiographic evidence of infection, eg abnormal findings on x-ray, CT scan, MRI, radiolabel scan (gallium, technetium, etc)
- patient has fever (> 38°C) with no other recognised cause and pain at the involved vertebral disc space
  and
  positive antigen test on blood or urine (eg *H. influenzae, S. pneumoniae, N. meningitidis,* or Group B *Streptococcus*)

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CNS: CENTRAL NERVOUS SYSTEM INFECTION

CNS-IC: intracranial infection (brain abscess, subdural or epidural infection, encephalitis)

Intracranial infection must meet at least one of the following criteria:

- patient has organisms cultured from brain tissue or dura
- patient has an abscess or evidence of intracranial infection seen during a surgical operation or histopathologic examination
- patient has at least two of the following signs or symptoms with no other recognised cause: headache, dizziness, fever (> 38°C), localising neurologic signs, changing level of consciousness, or confusion,
  and
  at least one of the following:
  - organisms seen on microscopic examination of brain or abscess tissue obtained by needle aspiration or by biopsy during a surgical operation or autopsy
  - positive antigen test on blood or urine
  - radiographic evidence of infection, eg abnormal findings on ultrasound, CT scan, MRI, radionuclide brain scan, or arteriogram
  - diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen
    and
    if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy

Reporting instruction: if meningitis and a brain abscess are present together, report the infection as IC.

CNS-MEN: meningitis or ventriculitis

Meningitis or ventriculitis must meet at least one of the following criteria:

- patient has organisms cultured from cerebrospinal fluid (CSF)
- patient has at least one of the following signs or symptoms with no other recognised cause:
  fever (> 38°C), headache, stiff neck, meningeal signs, cranial nerve signs, or irritability,
  and
  at least one of the following:
  - increased white cells, elevated protein, and/or decreased glucose in CSF
  - organisms seen on Gram's stain of CSF
  - organisms cultured from blood
  - positive antigen test of CSF, blood, or urine
  - diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen

and
if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy

Reporting instructions

- report CSF shunt infection as SSI if it occurs <=1 year of placement; if later or after manipulation/access of the shunt, report as CNS-MEN
- report meningoencephalitis as MEN
- report spinal abscess with meningitis as MEN

CNS-SA: spinal abscess without meningitis

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

- patient has organisms cultured from abscess in the spinal epidural or subdural space
- patient has an abscess in the spinal epidural or subdural space seen during a surgical operation or at autopsy or evidence of an abscess seen during a histopathologic examination
- patient has at least one of the following signs or symptoms with no other recognised cause: fever (> 38°C), back pain, focal tenderness, radiculitis, paraparesis, or paraplegia,
  and
  at least one of the following:
  - organisms cultured from blood
  - radiographic evidence of a spinal abscess, eg abnormal findings on myelography, ultrasound, CT scan, MRI, or other scans (gallium, technetium, etc),
    and
    if diagnosis is made antemortem, physician institutes appropriate antimicrobial therapy

Reporting instruction: report spinal abscess with meningitis as meningitis.

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EENT: EYE, EAR, NOSE, THROAT, OR MOUTH INFECTION

EENT-CONJ: conjunctivitis

Conjunctivitis must meet at least one of the following criteria:

- patient has pathogens cultured from purulent exudate obtained from the conjunctiva or contiguous tissues, such as eyelid, cornea, meibomian glands, or lacrimal glands
- patient has pain or redness of conjunctiva or around eye,
  and
  at least one of the following:
  - WBCs and organisms seen on Gram's stain of exudates
  - purulent exudates
  - positive antigen test (eg ELISA or IF for *Chlamydia trachomatis*, herpes simplex virus, adenovirus) on exudate or conjunctival scraping
  - multinucleated giant cells seen on microscopic examination of conjunctival exudate or scrapings
  - positive viral culture
  - diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen

Reporting instructions:

- report other infections of the eye as EYE
- do not report chemical conjunctivitis caused by silver nitrate ($AgNO_3$) as a health care–associated infection
- do not report conjunctivitis that occurs as a part of a more widely disseminated viral illness (such as measles, chickenpox, or a URI)

EENT-EYE: eye, other than conjunctivitis

An infection of the eye, other than conjunctivitis, must meet at least one of the following criteria:

- patient has organisms cultured from anterior or posterior chamber or vitreous fluid
- 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:
  - physician diagnosis of an eye infection
  - positive antigen test on blood (eg *H. influenzae, S. pneumoniae*)
  - organisms cultured from blood

EENT-EAR: ear mastoid

Ear and mastoid infections must meet at least one of the following criteria:
Otitis externa must meet at least one of the following criteria:

- patient has pathogens cultured from purulent drainage from ear canal

- patient has at least one of the following signs or symptoms with no other recognised cause: fever (> 38°C), pain, redness, or drainage from ear canal and organisms seen on Gram's stain of purulent drainage

Otitis media must meet at least one of the following criteria:

- patient has organisms cultured from fluid from middle ear obtained by tympanocentesis or at surgical operation
- patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C), pain in the eardrum, inflammation, retraction or decreased mobility of eardrum, or fluid behind eardrum

Otitis interna must meet at least one of the following criteria:

- patient has organisms cultured from fluid from inner ear obtained at surgical operation
- patient has a physician diagnosis of inner ear infection

Mastoiditis must meet at least one of the following criteria:

- patient has organisms cultured from purulent drainage from mastoid
- patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C), pain, tenderness, erythema, headache, or facial paralysis,
  and
  at least one of the following:
  - organisms seen on Gram's stain of purulent material from mastoid
  - 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:

- patient has organisms cultured from purulent material from tissues of oral cavity
- patient has an abscess or other evidence of oral cavity infection seen on direct examination, during a surgical operation, or during a histopathologic examination
- 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:
  - organisms seen on Gram's stain
  - positive KOH (potassium hydroxide) stain
  - multinucleated giant cells seen on microscopic examination of mucosal scrapings
  - positive antigen test on oral secretions
  - diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen
  - physician diagnosis of infection and treatment with topical or oral antifungal therapy

Reporting instruction: report healthcare-associated primary herpes simplex infections of the oral cavity as ORAL; recurrent herpes infections are not healthcare-associated.

EENT-SINU: sinusitis

Sinusitis must meet at least one of the following criteria:

- patient has organisms cultured from purulent material obtained from sinus cavity
- patient has at least one of the following signs or symptoms with no other recognised cause: fever (> 38°C), pain or tenderness over the involved sinus, headache, purulent exudate, or nasal obstruction,
  and
  at least one of the following:
  - positive transillumination
  - 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:

- Patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C), erythema of pharynx, sore throat, cough, hoarseness, or purulent exudate in throat,
  and
  at least one of the following:
  - organisms cultured from the specific site
  - organisms cultured from blood
  - positive antigen test on blood or respiratory secretions
  - diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen
  - physician diagnosis of an upper respiratory infection
- Patient has an abscess seen on direct examination, during a surgical operation, or during a histopathologic examination

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REPR: REPRODUCTIVE TRACT INFECTION

REPR-EMET: endometritis

Endometritis must meet at least one of the following criteria:

- patient has organisms cultured from fluid or tissue from endometrium obtained during surgical operation, by needle aspiration, or by brush biopsy
- patient has at least two of the following signs or symptoms with no other recognised cause: fever (> 38°C), abdominal pain, uterine tenderness, or purulent drainage from uterus

Reporting instruction: report postpartum endometritis as a health care-associated infection unless the amniotic fluid is infected at the time of admission or the patient was admitted 48 hours after rupture of the membrane.

REPR-EPIS: episiotomy

Episiotomy infections must meet at least one of the following criteria:

- postvaginal delivery patient has purulent drainage from the episiotomy
- postvaginal delivery patient has an episiotomy abscess

REPR-VCUF: vaginal cuff

Vaginal cuff infections must meet at least one of the following criteria:

- posthysterectomy patient has purulent drainage from the vaginal cuff
- posthysterectomy patient has an abscess at the vaginal cuff
- posthysterectomy patient has pathogens cultured from fluid or tissue obtained from the vaginal cuff

Reporting instruction: report vaginal cuff infections as SSI-O.

REPR-OREP: other infections of the male or female reproductive tract (epididymis, testes, prostate, 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:

- patient has organisms cultured from tissue or fluid from affected site
- patient has an abscess or other evidence of infection of affected site seen during a surgical operation or histopathologic examination
- patient has two of the following signs or symptoms with no other recognised cause: fever (> 38°C), nausea, vomiting, pain, tenderness, or dysuria

and

at least one of the following:

- organisms cultured from blood
- physician diagnosis

Reporting instructions:

- report endometritis as EMET
- report vaginal cuff infections as VCUF

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NEO: SPECIFIC NEONATAL CASE DEFINITIONS

NEO-CSEP: clinical sepsis

All of the three following criteria:

- supervising physician started appropriate antimicrobial therapy for sepsis for at least five days
- no detection of pathogens in blood culture or not tested
- no obvious infection at another site
  and
  two of the following criteria (without other apparent cause):
  - fever (> 38°C) or temperature instability (frequent post-set of the incubator) or hypothermia (< 36.5°C)
  - tachycardia (> 200/min) or new /increased bradycardia (< 80/min)
  - capillary refilling time (CRT) > 2s
  - new or increased apnoea(s) (> 20s)
  - unexplained metabolic acidosis
  - new-onset hyperglycemia (> 140mg/dl)
  - another sign of sepsis (skin colour (only if the CRT is not used), laboratory signs (CRP, interleukin), increased oxygen requirement (intubation), unstable general condition of the patient, apathy)

Notes:
A one-time detection of coagulase-negative staphylococci (CNS) in blood cultures should not exclude the diagnosis of clinical sepsis. A clinical sepsis can also be diagnosed with a single positive blood culture with CNS, which is considered as a blood culture contamination, while other criteria of CNS bloodstream infection are not met and criteria of clinical sepsis have been met.

NEO-LCBI: laboratory-confirmed BSI

- at least two of: temperature > 38°C or < 36.5°C or temperature instability, tachycardia or bradycardia, apnoea, extended capillary refilling time (CRT), metabolic acidosis, hyperglycaemia, other sign of BSI such as apathy,
  and
  - a recognised pathogen other than coagulase-negative staphylococci (CNS) cultured from blood or cerebrospinal fluid (CSF; this is included because meningitis in this age group is usually haematogenous, so positive CSF can be regarded as evidence of BSI even if blood cultures are negative or were not taken)

Notes:

- in order to be consistent with BSI reporting in adults (including secondary BSI), the criterion 'the organism is not related to an infection at another site' was removed from the Neo-KISS definition for the purposes of the EU PPS
- report the origin of the neonatal BSI in the field BSI origin
- if both the case definitions for NEO-LCBI and NEO-CNSB are matched, report NEO-LCBI

NEO-CNSB: laboratory-confirmed BSI with coagulase-negative staphylococci (CNS)

- at least two of: temperature > 38°C or < 36.5°C or temperature instability, tachycardia or bradycardia, apnoea, extended recapillarisation time, metabolic acidosis, hyperglycaemia, other sign of BSI such as apathy,
  and
  - CNS is cultured from blood or catheter tip
    and
  - patient 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

Notes:

- in order to be consistent with BSI reporting in adults (including secondary BSI), the criterion 'the organism is not related to an infection at another site' was removed from the Neo-KISS definition for the purposes of the EU PPS
- report the origin of the neonatal BSI in the field BSI origin
- if both the case definitions for NEO-LCBI and NEO-CNSB are matched, report NEO-LCBI

NEO-PNEU: pneumonia

- respiratory compromise
  and
- new infiltrate, consolidation or pleural effusion on chest x-ray
  and
- at least four of:
  - temperature > 38°C or < 36.5°C or temperature instability, tachycardia or bradycardia, tachypnoea or apnoea, dyspnoea, increased respiratory secretions, new onset of purulent sputum, isolation of a pathogen from respiratory secretions, C-reactive protein > 2.0 mg/dL, I/T ratio > 0.2

NEO-NEC: necrotising enterocolitis

- histopathological evidence of necrotising enterocolitis

- or at least one characteristic radiographic abnormality (pneumoperitoneum, pneumatosis intestinalis, unchanging ‘rigid’ loops of small bowel)
  plus
- at least two of the following without other explanation:
  - vomiting, abdominal distention, prefeeding residuals, persistent microscopic or gross blood in stools

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Microorganism code list

Organism can just be written on form and coded later.

Family	Microorganism	Code
Gram + cocci	*Staphylococcus aureus*	STAAUR
	Staphylococcus epidermidis	STAEPI
	Staphylococcus haemolyticus	STAHAE
	Coagulase-negative staphylococci, not specified	STACNS
	Other coagulase-negative staphylococci (CNS)	STAOTH
	Staphylococcus spp., not specified	STANSP
	Streptococcus pneumonia	STRPNE
	Streptococcus agalactiae (B)	STRAGA
	Streptococcus pyogenes (A)	STRPYO
	Other haemolytic streptococci (C, G)	STRHCG
	Streptococcus spp., other	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	GPCOTH
Gram – cocci	*Moraxella catharralis*	MORCAT
	Moraxella spp., other	MOROTH
	Moraxella spp., not specified	MORNSP
	Neisseria meningitides	NEIMEN
	Neisseria spp., other	NEIOTH
	Neisseria spp., not specified	NEINSP
	Gram-negative cocci, not specified	GNCNSP
	Other Gram-negative cocci	GNCOTH
Gram + 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	*Citrobacter freundii*	CITFRE
	Citrobacter koseri (eg *diversus*)	CITDIV
	Citrobacter spp., other	CITOTH
	Citrobacter spp., not specified	CITNSP

Family	Microorganism	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 pneumonia	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	ETBOTH
	Enterobacteriaceae, not specified	ETBNSP
Gram – 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

Family	Microorganism	Code
	Pseudomonadaceae family, other	PSEOTH
	Pseudomonadaceae family, not specified	PSENSP
	Haemophilus influenza	HAEINF
	Haemophilus parainfluenzae	HAEPAI
	Haemophilus spp., other	HAEOTH
	Haemophilus spp., not specified	HAENSP
	Legionella spp.	LEGSPP
	Achromobacter spp.	ACHSPP
	Aeromonas spp.	AEMSPP
	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, non enterobacteriaceae	GNBOTH
Anaerobic bacilli	*Bacteroïdes fragilis*	BATFRA
	Bacteroïdes other	BATOTH
	Clostridium difficile	CLODIF
	Clostridium other	CLOOTH
	Propionibacterium spp.	PROSPP
	Prevotella spp.	PRESPP
	Anaerobes, not specified	ANANSP
	Other anaerobes	ANAOTH
Other bacteria	Mycobacterium, atypical	MYCATY
	Mycobacterium tuberculosis complex	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	CANOTH
	Candida spp., not specified	CANNSP
	Aspergillus fumigates	ASPFUM

Family	Microorganism	Code
	Aspergillus niger	ASPNIG
	Aspergillus spp., other	ASPOTH
	Aspergillus spp., not specified	ASPNSP
	Other yeasts	YEAOTH
	Fungi other	FUNOTH
	Filaments other	FILOTH
	Other parasites	PAROTH
Viruses	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
	Influenza A virus	VIRINA
	Influenza B virus	VIRINB
	Influenza C virus	VIRINC
	Norovirus	VIRNOR
	Parainfluenzavirus	VIRPIV
	Respiratory syncytial virus (RSV)	VIRRSV
	Rhinovirus	VIRRHI
	Rotavirus	VIRROT
	SARS virus	VIRSAR
	Varicella-zoster virus	VIRVZV
	Virus, not specified	VIRNSP
	Other virus	VIROTH
Microorganism not identified – evidence exists that a microbiological examination has been done, but the micro-organism cannot be correctly classified		_NONID
Examination not done – no diagnostic sample taken, no microbiological examination done		_NOEXA
Sterile examination – a microbiological examination has been done AND the result was negative (ie negative culture)		_STERI
Result not (yet) available or missing – the results of the microbiological examination are not yet available or cannot be found		_NA

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Antimicrobial resistance markers and codes

For each antimicrobial marker, indicate whether microorganism is susceptible (S), intermediate (I), resistant (R) or susceptibility unknown (U):

Staphylococcus aureus:

- MRSA: susceptibility to oxacillin (OXA) or other marker of methicillin-resistant *S. aureus* (MRSA), such as cefoxitin (FOX), cloxacillin (CLO), dicloxacillin (DIC), flucloxacillin (FLC), (methicillin (MET)
- VISA, VRSA: susceptibility to glycopeptides (GLY): vancomycin (VAN) or teicoplanin (TEC); record the most resistant on phenotypic testing from VAN or GLY

Enterococcus spp.:

- VRE: susceptibility to glycopeptides (GLY): vancomycin (VAN) or teicoplanin (TEC); record the most resistant on phenotypic testing from VAN or GLY

Enterobacteriaceae (*Escherichia coli, Klebsiella* spp., *Enterobacter* spp., *Proteus* spp., *Citrobacter* spp., *Serratia* spp., *Morganella* spp.)

- third-generation cephalosporins (C3G): cefotaxime (CTX), ceftriaxone (CRO), ceftazidime (CAZ); record the most resistant on phenotypic testing from C3G
- carbapenems (CAR): imipenem (IPM), meropenem (MEM), doripenem (DOR); record the most resistant on phenotypic testing from IPM or MEM or DOR; ertapenem is NOT included

Pseudomonas aeruginosa:

- carbapenems (CAR): imipenem (IPM), meropenem (MEM), doripenem (DOR); record the most resistant on phenotypic testing from IPM or MEM or DOR

Acinetobacter spp.:

- carbapenems (CAR): imipenem (IPM), meropenem (MEM), doripenem (DOR); record the most resistant on phenotypic testing from IPM or MEM or DOR

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