

Surgical site infection surveillance protocol

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**Organ Space
Infection
Definitions
Supplement.**

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Female reproductive system operations (Abdominal hysterectomy and Caesarean section)

*Organ/ spaces: **intra-abdominal** (including peritoneum, subphrenic or subdiaphragmatic space or other intra-abdominal tissue or area not specified elsewhere), **endometritis, vaginal cuff, other infections of the female reproductive tract** (vagina, ovaries, uterus, or other deep pelvic tissues).*

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

Criterion 1: patient has organisms cultured from purulent material from intra-abdominal space obtained during a surgical operation or needle aspiration.

Criterion 2: patient has abscess or other evidence of intra-abdominal infection seen during a surgical operation or histopathologic examination.

Criterion 3: patient has at least two of the following signs or symptoms with no other recognised cause: fever (>38°C), nausea, vomiting, abdominal pain.

And

at least one of the following:

- a) organisms cultured from drainage from surgically placed drain (e.g. closed suction drainage system, open drain, 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, magnetic resonance imaging (MRI), or radiolabel scans (gallium, technetium, etc) or on abdominal x-ray.

Endometritis must meet at least one of the following criteria:

Criterion 1: patient has organisms cultured from tissue or fluid from endometrium obtained during surgical operation, by needle aspiration, or by brush biopsy.

Criterion 2: patient has at least two of the following signs and symptoms with no other recognised cause: fever (>38°C), abdominal pain, uterine tenderness, or purulent drainage from uterus.

Other infections of the female reproductive tract must meet the following criteria:

Criterion 1: patient has organisms cultured from tissue or fluid from affected site.

Criterion 2: patient has an abscess or other evidence of infection of affected site seen during a surgical operation or histopathologic examination.

Criterion 3: patient has at least 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:

- a) organisms cultured from blood.
- b) diagnosis by physician.

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

Criterion 1: post hysterectomy patient has purulent drainage from the vaginal cuff.

Criterion 2: post hysterectomy patient has an abscess at the vaginal cuff.

Criterion 3: post hysterectomy patient has pathogens cultured from fluid or tissue obtained from the vaginal cuff.

Criteria used to determine abdominal hysterectomy organ/space infections:

- nausea
- vomiting
- dysuria
- fever
- pain or tenderness
- organisms seen on Gram stain
- organisms cultured from fluid/tissue/purulent Material/drainage/blood
- abscess or evidence of infection
- diagnosis by surgeon or trained healthcare worker

Breast surgery

Organ/ spaces: **breast abscess or mastitis**

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

- Criterion 1: patient has a positive culture of affected breast tissue or fluid obtained by incision and drainage or needle aspiration.
- Criterion 2: patient has a breast abscess or other evidence of infection seen during a surgical operation or histopathologic examination.
- Criterion 3: patient has fever (>38°C) and local inflammation of the breast.
And
physicians diagnosis of breast abscess.

Criteria used to determine breast organ/space infections:

- organisms cultured from fluid/tissue
- abscess or evidence of infection
- fever
- redness
- diagnosis by surgeon or trained healthcare worker

Cranial Surgery

Organ/ spaces: Osteomyelitis, Intracranial infection (brain abscess, subdural or epidural infection encephalitis), Meningitis or ventriculitis

Osteomyelitis must meet at least one of the following criteria:

Criterion 1: Patient has organisms cultured from bone.

Criterion 2: Patient has evidence of Osteomyelitis on direct examination of the bone during a surgical operation or histopathological examination.

Criterion 3: 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:

- a) Organisms cultured from blood.
- b) Positive blood antigen test (e.g. *Haemophilus influenzae*, *Streptococcus pneumoniae*).
- c) radiographic evidence of infection, e.g. abnormal findings on x-ray, CT scan, magnetic resonance imaging (MRI), radiolabel scan (gallium, technetium, etc).

Intracranial infection (brain abscess, subdural or epidural infection , encephalitis)

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

Criterion 1: Patient has organisms cultured from brain tissue or dura.

Criterion 2: Patient has an abscess or evidence of intracranial infection seen during a surgical operation or histopathologic examination.

Criterion 3: Patient has at least two of the following signs or symptoms with no other recognised cause: headache, dizziness, fever (>38°C), localising neurological signs, changing level of consciousness or confusion.

And

at least one of the following:

- a) organisms seen on microscopic examination of brain or abscess tissue obtained by needle aspiration or by biopsy during a surgical operation or autopsy.
- b) positive antigen test on blood or urine.
- c) radiographic evidence of infection, e.g. abnormal findings on ultrasound, CT scan magnetic resonance imaging (MRI), radionuclide brain scan, or arteriogram.
- d) diagnosis single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen.

And

if diagnosis is made ante mortem, physician institutes appropriate antimicrobial therapy.

Meningitis or ventriculitis

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

Criterion 1: Patient has organisms cultured from cerebrospinal fluid (CSF).

Criterion 2: 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:

- a) increase white cells, elevated protein and/or decrease glucose in CSF.
- b) Organisms seen on Gram stain of CSF.
- c) Organisms cultured from blood.
- d) Positive antigen test of CSF, blood or urine.
- e) Diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen.

And

if diagnosis is made ante mortem, physician institutes appropriate Antimicrobial therapy

Criteria used to determine cranial surgery organ/space infections:

- pain or tenderness
- swelling
- headache or stiff neck
- dizziness
- fever
- heat
- neurological signs
- cranial nerve signs
- irritability

- changing level of consciousness or confusion
- organisms cultured from bone/blood/brain tissue/dura/cerebrospinal fluid
- organism seen on Gram stain of CSF
- increase white cells, elevated protein, and/or decrease glucose in CSF
- abscess or evidence of infection
- positive antigen test on blood or urine
- diagnostic single antibody titer (IgM) or fourfold increase in paired sera (IgG) for pathogen

Cardiac system surgery

Organ/ spaces: **Arterial or venous, Mediastinitis, Myocarditis/Pericarditis, Endocarditis**

Arterial or venous infection must meet the following criteria:

Criterion 1: patient has organisms cultured from arteries or veins removed during an operation.

And

blood culture not done or no organisms cultured from blood.

Criterion 2: patient has evidence of arterial or venous infection seen during a surgical operation or histopathologic examination.

Criterion 3: patient has a purulent discharge at involved vascular site.

And

blood culture not done or no organisms cultured from blood.

Mediastinitis must meet at least one of the following criteria:

Criterion 1: patient has organisms cultured from mediastinal tissue or fluid obtained during a surgical operation or needle aspiration.

Criterion 2: patient has evidence of Mediastinitis seen during a surgical operation histopathologic examination.

Criterion 3: patient has at least one of the following signs and symptoms with no other recognised cause: fever (>38°C), chest pain or sternal instability.

And

at least one of the following:

a) purulent discharge from mediastinal area.

- b) organisms cultured from blood or discharge from mediastinal area.
- c) mediastinal widening on x-ray.

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

Criterion 1: patient has organisms cultured from pericardial tissue or fluid obtained by needle aspiration or during a surgical operation.

Criterion 2: 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:

- a) abnormal ECG consistent with Myocarditis.
- b) positive antigen test on blood.
- c) evidence of Myocarditis or Pericarditis on histologic examination of heart tissue.
- a) fourfold rise in type-specific antibody with or without isolation of virus from pharynx or faeces.
- b) pericardial effusion identified by echocardiogram, CT, MRI or angiography.

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

Criterion 1: patient has organisms cultured from valve or vegetation.

Criterion 2: 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 manifestation, congestive heart failure or cardiac conduction abnormality.

And

at least one of the following:

- a) organisms cultured from two or more blood cultures.
- b) organisms seen on Gram stain of valve when culture is negative or not done.
- c) valvular vegetation seen during a surgical operation or autopsy.
- d) positive antigen test on blood or urine.
- e) evidence of new vegetation seen on echocardiogram.

And

- f) if diagnosis is made antemortem, physician institutes antimicrobial therapy.

Criteria used to determine cardiac organ/space infections:

- organisms cultured from fluid/tissue/arteries or veins/blood/valve or vegetation
- organisms cultured from two or more blood cultures
- organisms seen on Gram stain
- purulent discharge
- fever
- chest pain
- blood culture not done or no organisms isolated from blood
- paradoxical pulse
- increased heart size
- abnormal consistent ECG
- positive antigen test on blood or urine
- fourfold rise in type-specific antibody
- pericardial effusion
- mediastinal widening on x-ray
- sternal instability
- evidence of infection/mediastinitis
- new or changing murmur

- embolic phenomena
- skin manifestations
- congestive heart failure
- cardiac conduction abnormality
- valvular vegetation on operation or post mortem
- new vegetation on echocardiogram
- antimicrobial therapy

Vascular surgery

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

Criterion 1: patient has organisms cultured from arteries or veins removed during an operation.

And

blood culture not done or no organisms cultured from blood.

Criterion 2: patient has evidence of arterial or venous infection seen during a surgical operation or histopathologic examination.

Criterion 3: patient has at least one of the following signs or symptoms with not 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.

Criterion 4: patient has a purulent discharge at involved vascular site.

And

blood culture not done or no organisms cultured from blood.

Criteria used to determine major vascular organ/space infections:

- blood culture not done or no organisms cultured from blood
- organisms cultured from arteries or veins
- evidence of infection
- fever
- pain
- redness
- heat

Large bowel Surgery

Gastrointestinal tract infection This includes oesophagus, stomach, small and large bowel, and rectum (excluding gastroenteritis and appendicitis), and must meet at least one of the following criteria:

Criterion 1: There is an abscess or other evidence of infection seen during a surgical operation or on histopathological examination.

Criterion 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 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 pathological findings on radiological examination.
- e) evidence of pathological findings on endoscopic examination (e.g. *Candida oesophagitis* or proctitis).

Intra-abdominal infection This includes gall bladder, bile ducts, liver (excluding viral hepatitis), spleen, pancreas, peritoneum, subphrenic or subdiaphragmatic space, or other intra-abdominal tissue or area not specified elsewhere, **and** must meet at least one of the following criteria:

Criterion 1: Organisms are cultured from purulent material from intra-abdominal space obtained during a surgical operation or needle aspiration.

Criterion 2: There is an abscess or other evidence of intra-abdominal infection during a surgical operation or on histopathological examination.

Criterion 3: The 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:

- a) organisms cultured from drainage from surgically placed drain (e.g., closed suction drainage system, open drain, 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, magnetic resonance imaging (MRI), or radiolabelled scans (gallium, technetium, etc.) or on abdominal x-ray.

Criteria used to determine large bowel organ/space infections:

- nausea
- vomiting
- fever
- pain or tenderness
- organisms seen on Gram stain
- organisms cultured from fluid/tissue/purulent material/drainage/blood
- abscess or evidence of infection
- abnormal findings on scan or x-ray
- diagnosis by surgeon or trained healthcare worker

Orthopaedic surgery

Organ/ spaces: joint, bursa or bone

Joint or bursa infection must meet at least one of the following criteria:

- Criterion 1: patient has organisms cultured from joint fluid or synovial biopsy.
- Criterion 2: patient has evidence of joint or bursa infection seen during a surgical operation or histopathologic examination.
- Criterion 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 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 or radiolabel scan.

Osteomyelitis must meet at least one of the following criteria:

- Criterion 1: patient has organisms cultured from bone.
- Criterion 2: patient has evidence of osteomyelitis on direct examination of the bone during a surgical operation or histopathologic examination.

Criterion 3: 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:

- a) organisms cultured from blood.
- b) positive blood antigen test.
- c) radiographic evidence of infection.

Criteria used to determine orthopaedic organ/space infections:

- limitation of motion
- evidence of effusion
- organisms and white blood cells seen on Gram stain of joint fluid
- positive antigen test on blood, urine or joint fluid
- cellular profile and chemistries of joint fluid compatible with infection
- organisms cultured from fluid/tissue/biopsy/blood/bone
- evidence of infection
- fever
- swelling
- pain or tenderness
- heat
- drainage