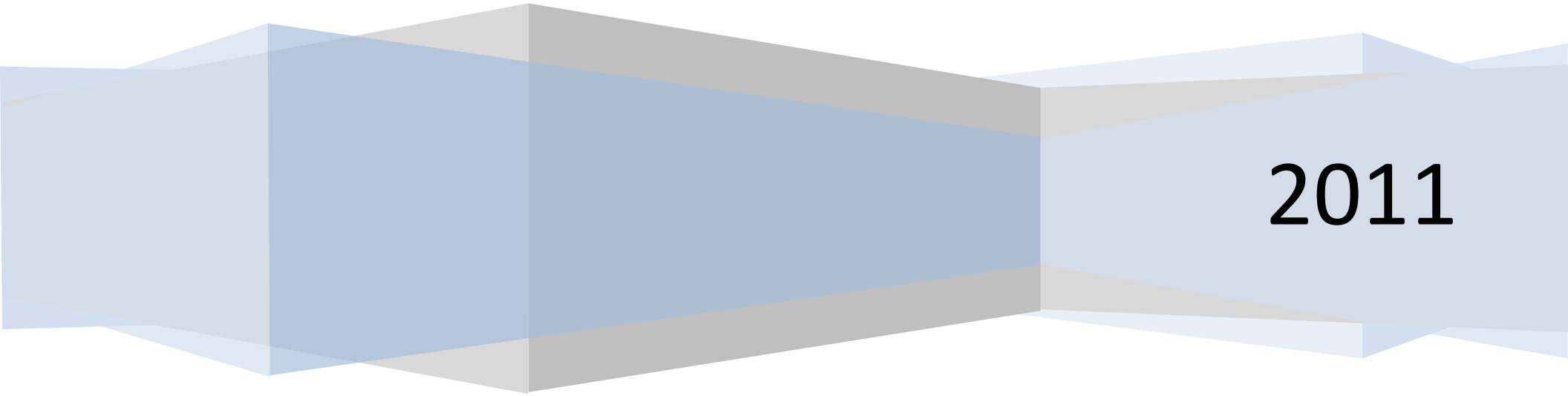
Nevada State Health Division

# Sentinel Event Reporting Guidance

## Compliance Manual

version 1.1.1



2011

# surgery on wrong body part

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| surgical | surgery performed on the wrong body part | surgery on wrong body part | Defined as any surgery performed on a body part that is not consistent with the correctly documented informed consent for that patient.<br><br>Surgery includes endoscopies and other invasive procedures.<br><br>Excludes emergent situations that occur in the course of surgery and/or whose exigency precludes obtaining informed consent. | NQF |

**implementation guidance**

This event is intended to capture:

- Surgery on the right body part, but on the wrong location on the body; for example, left versus right (appendages and/or organs), level (spine).
- Wrong site surgery, even if corrected intraoperatively, as long as the surgery had begun, based on the definition below.

This event is not intended to capture:

- Changes in plan upon surgical entry into the patient due to the discovery of pathology in close proximity to the intended site when the risk of a second surgery outweighs the benefit of patient consultation; or the discovery of an unusual physical configuration (e.g., adhesions, spine level/extra vertebrae).

**NAC 449.9743 "Surgery" defined.** (NRS 449.037) "Surgery" means the treatment of a human being by a physician using one or more of the following procedures:

1. Cutting into any part of the body using a scalpel, electrocautery or any other means for diagnosis or the removal or repair of diseased or damaged tissue, organs, tumors or foreign bodies.

2. The reduction of a fracture or the dislocation of a bone, joint or bony structure.

3. The repair of a malformation of the body resulting from an injury, a birth defect or another cause, that requires cutting and manipulation or a suture.

4. An instrumentation of the uterine cavity of a woman for diagnostic or therapeutic purposes, including the procedure commonly known as dilation and curettage.

5. Any instrumentation of, or injection of a substance into, the uterine cavity of a woman to terminate a pregnancy.

6. Any procedure to sterilize a human being.

7. An endoscopic procedure.

8. A laproscopic procedure.

Organizations may choose to adopt a list of surgical procedures to supplement the definition above; for example, the Institute of Clinical Systems Improvement list of procedures is commonly used.

Surgery begins, regardless of setting, at the point of surgical incision, tissue puncture, or the insertion of an instrument into tissues, cavities, or organs.

Surgery ends after counts have concluded, the surgical incision has been closed, and/or operative device(s) such as probes have been removed, regardless of setting (e.g., postanesthesia recovery unit, surgical suite, endoscopy unit).

Although an incorrectly placed surgical mark could result in surgery being performed on the wrong body part, surgery does not begin at the time a surgical mark is made on the patient. Placing a mark on the wrong body part does not in itself constitute wrong site surgery.

**examples**

*actual sentinel event*: A hand surgeon performs trigger finger surgery on the wrong finger. Before applying the dressing, the surgeon realizes the mistake. He then performs the procedure on the correct finger.

# surgery on wrong patient

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| surgical | surgery performed on the wrong patient | surgery on wrong patient | Defined as any surgery on a patient that is not consistent with the correctly documented informed consent for that patient.<br><br>Surgery includes endoscopies and other invasive procedures. | NQF |

**implementation guidance**

This event is intended to capture:

- Surgical procedures (whether or not completed) initiated on one patient that were intended for a different patient.

**NAC 449.9743 "Surgery" defined.** (NRS 449.037) "Surgery" means the treatment of a human being by a physician using one or more of the following procedures:

1. Cutting into any part of the body using a scalpel, electrocautery or any other means for diagnosis or the removal or repair of diseased or damaged tissue, organs, tumors or foreign bodies.

2. The reduction of a fracture or the dislocation of a bone, joint or bony structure.

3. The repair of a malformation of the body resulting from an injury, a birth defect or another cause, that requires cutting and manipulation or a suture.

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6. Any procedure to sterilize a human being.

7. An endoscopic procedure.

8. A laproscopic procedure.

Organizations may choose to adopt a list of surgical procedures to supplement the definition above; for example, the Institute of Clinical Systems Improvement list of procedures is commonly used.

Surgery begins, regardless of setting, at the point of surgical incision, tissue puncture, or the insertion of an instrument into tissues, cavities, or organs.

Surgery ends after counts have concluded, the surgical incision has been closed, and/or operative device(s) such as probes have been removed., regardless of setting (e.g., postanesthesia recovery unit, surgical suite, endoscopy unit).

**examples**

*risk thereof sentinel event*: A 42 year-old male is admitted for pneumonia. The patient is *not* planning to have any surgical procedure. The patient's roommate is scheduled to have an elective cyst removal. A nurse confuses the bed numbers and takes the patient with the pneumonia to the operating room. The patient is prepped and placed under general anesthesia. Following the administration of anesthesia, the mistake is identified. There has been no skin perforation, yet there was a risk of surgery on the wrong patient.

# wrong surgical procedure

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| surgical | wrong surgical procedure performed on a patient | wrong surgical procedure | Defined as any surgical procedure performed on a patient that is not consistent with the correctly documented informed consent for that patient.<br><br>Surgery includes endoscopies and other invasive procedures.<br><br>Excludes emergent situations that occur in the course of surgery and/or whose exigency precludes obtaining informed consent. | NQF |

**implementation guidance**

This event is intended to capture:

- Any surgical procedure performed incorrectly.

This event is not intended to capture:

- Changes in plan upon surgical entry into the patient due to the discovery of pathology in close proximity to the intended site when the risk of a second surgery outweighs the benefit of patient consultation; or the discovery of an unusual physical configuration (e.g., adhesions, spine level/extra vertebrae).

**NAC 449.9743 "Surgery" defined.** (NRS 449.037) "Surgery" means the treatment of a human being by a physician using one or more of the following procedures:

1. Cutting into any part of the body using a scalpel, electrocautery or any other means for diagnosis or the removal or repair of diseased or damaged tissue, organs, tumors or foreign bodies.

2. The reduction of a fracture or the dislocation of a bone, joint or bony structure.

3. The repair of a malformation of the body resulting from an injury, a birth defect or another cause, that requires cutting and manipulation or a suture.

4. An instrumentation of the uterine cavity of a woman for diagnostic or therapeutic purposes, including the procedure commonly known as dilation and

curettage.

5. Any instrumentation of, or injection of a substance into, the uterine cavity of a woman to terminate a pregnancy.

6. Any procedure to sterilize a human being.

7. An endoscopic procedure.

8. A laproscopic procedure.

Organizations may choose to adopt a list of surgical procedures to supplement the definition above; for example, the Institute of Clinical Systems Improvement list of procedures is commonly used.

Surgery begins, regardless of setting, at the point of surgical incision, tissue puncture, or the insertion of an instrument into tissues, cavities, or organs.

Surgery ends after counts have concluded, the surgical incision has been closed, and/or operative device(s) such as probes have been removed, regardless of setting (e.g., postanesthesia recovery unit, surgical suite, endoscopy unit).

**examples**

# retained foreign object

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| surgical | unintended retention of a foreign object in a patient after surgery or other procedure | retained foreign object | Excludes a) objects present prior to surgery that are intentionally left in place; b) objects intentionally implanted as part of a planned intervention; and c) objects not present prior to surgery that are intentionally left in when the risk of removal exceeds the risk of retention (such as microneedles, broken screws). | NQF |

**implementation guidance**

This event is intended to capture:

- Occurrences of unintended retention of objects at any point after the surgery ends, regardless of setting or of whether the object is removed.

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1. Cutting into any part of the body using a scalpel, electrocautery or any other means for diagnosis or the removal or repair of diseased or damaged tissue, organs, tumors or foreign bodies.

2. The reduction of a fracture or the dislocation of a bone, joint or bony structure.

3. The repair of a malformation of the body resulting from an injury, a birth defect or another cause, that requires cutting and manipulation or a suture.

4. An instrumentation of the uterine cavity of a woman for diagnostic or therapeutic purposes, including the procedure commonly known as dilation and curettage.

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6. Any procedure to sterilize a human being.

7. An endoscopic procedure.

8. A laproscopic procedure.

Organizations may choose to adopt a list of surgical procedures to supplement the definition above; for example, the Institute of Clinical Systems Improvement list of procedures is commonly used.

Surgery begins, regardless of setting, at the point of surgical incision, tissue puncture, or the insertion of an instrument into tissues, cavities, or organs.

Surgery ends after counts have concluded, the surgical incision has been closed, and/or operative device(s) such as probes have been removed, regardless of setting (e.g., postanesthesia recovery unit, surgical suite, endoscopy unit).

**examples**

*risk thereof sentinel event*: A 29 year-old female presents in active labor. The patient is taken to labor and delivery. During labor, the baby is found to be in fetal distress and a leg is identified at the cervical os. The mother is taken to the operating room emergently. A C-section is performed and a healthy baby is delivered. During the initial count, a missing lap is identified. The cavity is examined, and the count is repeated, but the missing lap remains. Radiologic evaluation does not reveal the lap either. The incision is closed. While the patient is transferred to the recovery room, an end of a lap is noted in the vaginal canal and is successfully removed.

## intra- or post-operative death

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| surgical | intraoperative or immediately postoperative death in an ASA Class I patient<br><br>ASA 1: No organic pathology or patients in whom the pathological process is localized and does not cause any systemic disturbance or abnormality<br><br>(Unexpected death in other ASA Class patients would be captured in OTHER category) | intra- or post-operative death | Includes all ASA Class I patient deaths in situations in which anesthesia was administered; the planned surgical procedure may or may not have been carried out.<br><br>Immediately postoperative means within 24 hours after surgery or other invasive procedure was completed, or after administration of anesthesia (if surgery was not completed). | NQF |

**implementation guidance**

This event is intended to capture:

- ASA Class I patient death associated with the administration of any anesthesia including local, whether or not the planned surgical procedure was carried out.

**NAC 449.9743 "Surgery" defined.** (NRS 449.037) "Surgery" means the treatment of a human being by a physician using one or more of the following procedures:

1. Cutting into any part of the body using a scalpel, electrocautery or any other means for diagnosis or the removal or repair of diseased or damaged tissue, organs, tumors or foreign bodies.

2. The reduction of a fracture or the dislocation of a bone, joint or bony structure.

3. The repair of a malformation of the body resulting from an injury, a birth defect or another cause, that requires cutting and manipulation or a suture.

4. An instrumentation of the uterine cavity of a woman for diagnostic or therapeutic purposes, including the procedure commonly known as dilation and

curettage.

5. Any instrumentation of, or injection of a substance into, the uterine cavity of a woman to terminate a pregnancy.

6. Any procedure to sterilize a human being.

7. An endoscopic procedure.

8. A laproscopic procedure.

Organizations may choose to adopt a list of surgical procedures to supplement the definition above; for example, the Institute of Clinical Systems Improvement list of procedures is commonly used.

Surgery begins, regardless of setting, at the point of surgical incision, tissue puncture, or the insertion of an instrument into tissues, cavities, or organs.

Surgery ends after counts have concluded, the surgical incision has been closed, and/or operative device(s) such as probes have been removed, regardless of setting (e.g., postanesthesia recovery unit, surgical suite, endoscopy unit).

**examples**

# contaminated drug, device, or biologics

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| product or device | patient death or serious disability associated with the use of contaminated drugs, devices, or biologics provided by the healthcare facility | contaminated drug, device, or biologics | Includes detectable contaminants in drugs, devices, or biologics regardless of the source of contamination and/or product. | NQF |

| implementation guidance |
|---|
| The term detectable is intended to capture contaminations that can with or without the use of detection mechanisms that are in general use; these contaminations are to be reported when they become known to the provider or healthcare facility. Detection mechanisms may include cultures and tests that signal changes in pH or glucose levels. |

| examples |
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# device failure

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| product or device | patient death or serious disability associated with the use or function of a device in patient care in which the device is used or functions other than as intended | device failure | Includes, but is not limited to, catheters, drains and other specialized tubes, infusion pumps, and ventilators. | NQF |

**implementation guidance**

This event is intended to capture occurrences whether or not the use is intended or described by the device manufacturers' literature.

The Food and Drug Administration defines medical device as "an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article, including a component part, or accessory which is:

- recognized in the official National Formulary, or the United States Pharmacopoeia, or any supplement to them,
- intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease, in man or other animals, or
- intended to affect the structure or any function of the body of man or other animals, and which does not achieve any of its primary intended purposes through chemical action within or on the body of man or other animals and which is not dependent upon being metabolized for the achievement of any of its primary intended purposes."

**examples**

# air embolism

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| product or device | patient death or serious disability associated with intravascular air embolism that occurs while being cared for in a healthcare facility | air embolism | Excludes death or serious disability associated with neurosurgical procedures known to present a high risk of intravascular air embolism. | NQF |

| implementation guidance |
|---|
| High-risk procedures, other than neurosurgical procedures, that include a small but known risk of air embolism are reportable under this event, including, but not limited to, those involving the head and neck, vaginal delivery and cesarean section, spinal instrumentation procedures, and liver transplantation. |

| examples |
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| *risk thereof sentinel event*: Air embolism includes procedures that have a small but known risk—again confirming the fact that risk does not imply expected outcome. |

# infant discharge to wrong person

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| patient protection | infant discharged to the wrong person | infant discharged to wrong person | | NQF |

| implementation guidance |
|---|
| Stedman's Online Medical Dictionary defines an infant as a child under the age of one year. |

| examples |
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| *risk thereof sentinel event*: Mrs. M delivers a healthy baby boy. In preparation for discharge home, Mrs. M signs all documents and is ready to go. At the time of departure, Mrs. G's baby is delivered to Mrs. M. Upon arrival of the baby, Mrs. M states that the baby is not hers. Nursing is notified, the error is acknowledged, and the correct baby goes home with Mrs. M. In this situation, multiple corrective measures failed to recognize the wrong baby. |

# elopement

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| patient protection | patient death or serious disability associated with patient elopement (disappearance) | elopement | Excludes events involving competent adults. | NQF |

| implementation guidance |
|---|
| This event is not intended to capture death or serious disability that occurs due to circumstances unrelated to the elopement (after the patient is located).<br><br>The term competent adult should be interpreted in accordance with prevailing legal standards. |

| examples |
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# suicide

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| patient protection | patient suicide, or attempted suicide, while being cared for in a healthcare facility | suicide | Defined as events that result from patient actions after admission to a healthcare facility. Excludes deaths resulting from self-inflicted injuries that were the reason for admission to the healthcare facility. | NQF |

| implementation guidance |
|---|
| This event is not intended to capture patient suicide or attempted suicide when the patient is not physically present in the “healthcare facility”. |

| examples |
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# medication error

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | patient death or serious disability associated with a medication error (e.g., errors involving the wrong, drug, wrong dose, wrong patient, wrong time, wrong rate, wrong preparation, or wrong route of administration) | medication error | Excludes reasonable differences in clinical judgment involving drug selection and dose.<br><br>Includes administration of a medication to which a patient has a known allergy and drug-drug interactions for which there is known potential for death or serious disability. | NQF |

**implementation guidance**

This event is intended to capture:

- The most serious medication errors, including occurrences in which a patient known to have serious allergies to specific medications/agents receives those medications/agents, resulting in serious harm or death. These events may occur as a result of failure to collect allergy information; failure to review available allergy information; failure to assure the availability of allergy information and prominently display it; or through other system failures that are determined by investigation to be the cause of the adverse event.
- Occurrences in which a patient dies or suffers serious disability as a result of failure to administer a prescribed medication.
- Occurrences in which a patient dies or suffers serious disability as a result of the wrong administration technique.

This event is not intended to capture:

- Patient death or serious disability associated with allergies that could not reasonably have been known or discerned in advance of the event. These unexpected deaths would be captured in “other” category.

**examples**

*actual sentinel event*: A terminally ill cancer patient receives a 10-fold overdose of morphine and dies within 24 hours. The patient was lucid prior to the overdose; after the overdose, the patient is comatose and never recovers consciousness before dying. Despite the patient’s terminal condition this is a medication error. Event if the patient was resuscitated and lived, this would still be a sentinel event.

# transfusion error

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | transfusion error | transfusion error | | NQF |

| implementation guidance |
|---|
| This event is not intended to capture:<br><br>▪ These deaths would be categorized in 'other' category. |

| examples |
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## labor or delivery

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | maternal death or serious disability associated with labor or delivery in a pregnancy while being cared for in a healthcare facility | labor or delivery | | NQF |

| implementation guidance |
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| examples |
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# hypoglycemia

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | patient death or serious disability associated with hypoglycemia, the onset of which occurs while the patient is being cared for in a healthcare facility | hypoglycemia | | NQF |

| implementation guidance |
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| Hypoglycemia is defined as blood glucose levels <60mgdL (ICD-9, 251.0).<br><br>Very difficult to determine and not likely to account for many sentinel events. |

| examples |
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# neonate hyperbilirubinemia

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | death or serious disability (kernicterus) associated with failure to identify and treat hyperbilirubinemia in neonates | neonate hyperbilirubinemia | Hyperbilirubinemia is defined as bilirubin levels >30 mg/dl. | NQF |

| implementation guidance |
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| The organization's obligation is to report the event when it is made aware of the death or serious disability either by re-admittance or by the patient's family. |

| examples |
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# pressure ulcer (stage 3 or 4)

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | stage 3 or 4 pressure ulcer acquired after admission to a healthcare facility | pressure ulcer (stage 3 or 4) | | NQF |

| implementation guidance |
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| This is intended for Stage 3 -4 pressure ulcers only. |

| examples |
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| *actual sentinel event*: A 68 year-old male with history of acute and chronic respiratory failure and diagnosis of lung cancer presents. Skin assessment on admission is clear. Nursing notes revealed redness on hospital day 14. On hospital day 23, patient found to have stage 4 pressure ulcer. Despite patient's diagnosis and co-morbidities, a pressure ulcer is not expected. |

# spinal manipulation

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | patient death or serious disability due to spinal manipulative therapy | spinal manipulation | | NQF |

| implementation guidance |
|---|
| Spinal manipulative therapy encompasses all types of manual techniques, including spinal mobilization (movement of a joint within its physiologic range of motion) and manipulation (movement beyond its physiologic range of motion), regardless of their precise anatomic and physiologic focus or their discipline of origin. |

| examples |
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## wrong sperm or egg

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| care management | artificial insemination with the wrong donor sperm or wrong egg | wrong sperm or egg | | NQF |

| implementation guidance |
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| The organization's obligation is to report the event when it is made aware of the occurrence. |

| examples |
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# electric shock

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| environment | patient death or serious disability associated with an electric shock while being cared for in a healthcare facility | electric shock | | NQF |

| implementation guidance |
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| This event is intended to capture:<br>▪ Patient death or disability associated with unintended electric shock during the course of care or treatment.<br>This event is not intended to capture:<br>▪ Patient death or disability associated with emergency defibrillation during ventricular fibrillation. |

| examples |
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# wrong or contaminated gas

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| environment | any incident in which a line designated for oxygen or other gas to be delivered to a patient contains the wrong gas or is contaminated by toxic substances | wrong or contaminated gas | | NQF |

| implementation guidance |
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| examples |
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# burn

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| environment | patient death or serious disability associated with a burn incurred from any source while being cared for in a healthcare facility | burn | | NQF |

| implementation guidance |
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| examples |
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# fall

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| environment | patient death or serious disability or risk thereof associated with a fall while being cared for in a healthcare facility | fall | | NQF |

| implementation guidance |
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| This category is not intended to include slips and trips. |

| examples |
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| *risk thereof sentinel event*: A 44 year-old morbidly obese male is admitted for a knee replacement. At the time of diagnosis, patient is assessed as a high risk for a fall and appropriate measures are recommended. The measures include 2-person assist, call light, close proximity to nursing, and room signage. During hospitalization, the patient uses the call light to alert nursing that he needs to use the restroom. Only 1 nurse responds and assists the patient to the restroom. The nurse then leaves the patient on the toilet to get the second nurse to assist. The patient falls from the toilet and strikes his hip and leg. Two nurses then return to the room and assist the patient back to bed. The patient complains of sore hip and X-rays are done, but no fracture is identified. This is a process failure and falls into the risk thereof category and thus needs to be reported. A fall does not need to result in permanent loss of function or death as a direct result of injuries sustained by the fall to qualify as a sentinel event.<br><br>*actual sentinel event*: A patient is admitted with a diagnosis of lithium intoxication. The patient falls while in the hospital resulting in a fracture of the right humerus. Post X-ray, the patient is placed in a sling, and no other intervention is required. Hospital reasons that this is not a sentinel event because the injury sustained as a result of the fall did not lead to major permanent loss of function or death. The sentinel event definition contains no such criterion by which an event must result in permanent loss or death to qualify as a sentinel event. Permanent loss of function or death are not required outcomes for an event to be considered a sentinel event. |

# restraint

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| environment | patient death or serious disability associated with the use of restraints or bedrails while being cared for in a healthcare facility | restraint | | NQF |

**implementation guidance**

The event is intended to capture instances in which restraints are implicated in the death; for example, the use led to strangulation/entrapment. Death/disability resulting from falls caused by lack of restraints would be captured under falls.

Restraint is currently defined by the Joint Commission, by the Centers for Medicare and Medicaid Services, and by some states. If none of those definitions apply to an institution, the following definition, which is intended to comprise definitions from the named organizations, is offered: Restraint is defined as any method of restricting a patient's freedom of movement that: is not a usual and customary part of a medical diagnostic or treatment procedure to which the patient or his or her legal representative has consented; that is not indicated to treat the patient's medical condition or symptoms; or that does not promote the patient's independent functioning.

**examples**

# impersonation of healthcare provider

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| criminal | any instance of care ordered by or provided by someone impersonating a physician, nurse, pharmacist, or other licensed healthcare provider | impersonation of healthcare provider | | NQF |

| implementation guidance |
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| examples |
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# abduction

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| criminal | abduction of a patient of any age | abduction | | NQF |

| implementation guidance |
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| examples |
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## sexual assault

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| criminal | sexual assault on a patient within or on the grounds of a healthcare facility | sexual assault | | NQF |

| implementation guidance |
|---|
| Language and definitions may vary based on state statute (e.g.,many states have existing statutes that may use the terms sexual assault or simple assault or criminal sexual conduct); however, the principle and intent remain regardless of the language required based on jurisdiction.<br><br>**NRS 200.366 Sexual assault: Definition; penalties.**<br><br>1. A person who subjects another person to sexual penetration, or who forces another person to make a sexual penetration on himself or herself or another, or on a beast, against the will of the victim or under conditions in which the perpetrator knows or should know that the victim is mentally or physically incapable of resisting or understanding the nature of his or her conduct, is guilty of sexual assault. |

| examples |
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# physical assault

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| criminal | death or significant injury of a patient or staff member resulting from a physical assault (i.e., battery) that occurs within or on the grounds of a healthcare facility | physical assault | | NQF |

| implementation guidance |
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| Language and definitions may vary based on state statute (e.g., many states have existing statutes that use the terms first degree assault or second degree assault or battery). |

| examples |
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# CLABSI

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| healthcare-associated infection | primary bloodstream infection that is central line-associated | CLABSI | | AHRQ<br><br>NHSN |

| implementation guidance |
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| A simplified tool based on NHSN guidance and a CLABSI checklist are included on the next few pages. |

| examples |
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| *actual sentinel event*: A catheter tip isolate is *S aureus*. The blood culture isolate is coagulase-negative *staphylococci* (CNS). The hospital reasons that when CNS is found in a blood culture, it is usually a skin contaminant and the specimen is probably just contaminated and, therefore, unreliable. The case could not rule out infection from another source causing the blood-stream infection. Despite this reasoning, if a common commensal is isolated, it should not be automatically assumed that it does not meet the criteria for a CLABSI. NHSN criteria must be reviewed to help make the appropriate determination.<br><br>*actual sentinel event*: One of two cultures test positive. The hospital reasons that the positive test is probably just due to contamination since only one of two cultures test positive; therefore, the CLABSI is not proven. Despite this reasoning, it should not be assumed that just because only one of two cultures test positive that the NHSN criteria for a CLABSI are not met. NHSN criteria must be reviewed to help make the appropriate determination. |

# CLABSI Criteria 1 & 2 – Used for Patients of any Age

Facility: _____ Date: _____
Patient #_____ Medical Record #_____
Admission Date: _____ Discharge Date: _____
Reviewer Initials: _____ **Notes:**

_____
_____
_____
_____
_____
_____
_____
_____
_____

**Blood Cultures** (list here)

Date: _____Organism: _____#_____
Date: _____Organism: _____#_____
Date: _____ Organism: _____#_____
Date: _____ Organism: _____#_____
Date: _____ Organism: _____#_____
Date: _____ Organism: _____#_____
Date: _____ Organism: _____#_____

**Non-blood cultures** (list here)

Date: _____Source: _____Organism: _____
Date: _____Source: _____Organism: _____
Date: _____Source: _____ Organism: _____
Date: _____Source: _____ Organism: _____
Date: _____Source: _____ Organism: _____
Date: _____Source: _____ Organism: _____
Date: _____Source: _____ Organism: _____

Central line (CL) in place or within 48 hours of CL discontinuation when blood cultures drawn *(mark yes & to Criteria 1 or 2)* ☐
**Notes:** Dates & site notes if needed: _____

→ No – Does not meet NHSN

## Criteria 1

Patient has a **recognized pathogen** cultured from **one or more blood cultures** *(circle pathogen in blood culture section & check yes)* **Yes** ☐

→ No – Does not meet NHSN

Organism cultured from blood is <u>not</u> related to an infection at another site *(check if <u>not</u> related)* ☐

→ No – Does not meet NHSN

→ Yes (not related) – Meets Criteria

## Criteria 2

**Common commensal** cultured from **<u>two</u> or more blood cultures drawn on separate occasions** *(circle commensals in blood culture section & check yes)* **Yes** ☐

→ No – Does not meet NHSN

Organism cultured from blood is <u>not</u> related to an infection at another site *(check if <u>not</u> related)* ☐

Patient has at least one of the following signs or symptoms (circle all that apply): *(check if yes)* ☐
**Fever (>38 C or 100.4 F)** **Admit Temp**: _____
**Chills**
**Hypotension** **Admit Blood Pressure**: _____
Date: _____ Symptom: _____
Date: _____ Symptom: _____
Date: _____ Symptom: _____

Signs or symptoms not related to an infection at another site *(check if <u>not</u> related)* ☐

→ Yes (not related) – Meets Criteria 2

→ No – Does not meet NHSN

**CIRCLE CONCLUSION**

YES

NO

INDETERMINATE

**Central Line- Associated Bloodstream Infection (CLABSI) Event Check List Criteria**

*Instructions for use*

Use this check list to determine if an infection meets the NHSN CLABSI criteria.

Blood cultures: Fill in relevant blood cultures in blood culture section, if you need to ensure there are 2 different blood cultures then include the unique identifying number for the blood culture next to #_____.

Non-blood cultures: Fill in the relevant cultures to help you determine if a secondary infection exists.

Then go down the flow sheet using Criteria 1 if you find a recognized pathogen and Criteria 2 if you find common commensals cultured from 2 or more blood cultures. As instructed in the flow sheet, circle the relevant cultures used to assist in make the CLABSI determination, for example, you would circle the recognized pathogen in the blood cultures box that was used to come up with a determination of a CLABSI. If none, do not circle.

You must understand the terms defined in bold below to complete the criteria checklist. You will find the terms in **bold letters** in the checklist.

**Central line** defined: An intravascular catheter (used for infusion, withdrawal of blood, or hemodynamic monitoring) that terminates at or close to the heart or in one of the great vessels which includes the: aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, femoral veins, and in neonates, the umbilical artery/vein.

The Central line (CL) must be in place or within 48 hours of CL discontinuation when blood cultures drawn are drawn.

**Common Commensals** include but are not limited to (for a more extensive list, please refer to common commensal list):

- Diphtheroids (*Corynebacterium* spp. not C. diphtheria
- *Bacillus* spp. not *B. anthracis, Propionibacterium* spp.
- Coagulase-negative staphylococci including *S. epidermidis*
- Viridans group streptococci, *Aerococcus* spp*., Mircrococcus* spp*., S. salivarius*

**Recognized pathogens** (Do Not include common commensals) include but are not limited to:

- *S. aureus*
- *Enterococcus* spp.
- *E. coli*
- *Pseudomonas* spp.
- *Klebsiella* spp.
- *Candida* spp.

**One or more blood cultures** means at least one bottle from each blood draw (each draw/culture requires 2 bottles) is reported by the laboratory to have grown organisms. It is a positive blood culture. For example, two blood cultures would require 4 bottles and for both blood cultures to be positive, one bottle from each set would have to grown organisms.

**Two or more blood cultures drawn on separate occasions** means:

1. Blood from at least 2 blood draws were collected within two days of each other
2. At least one bottle from each blood draw is reported by the laboratory as having grown the same common commensal. It is considered a positive blood culture.

Pediatric blood draw consideration

Blood culture may consist of a single bottle for a pediatric blood draw. Therefore to meet criteria, each bottle from two or more draws would have to be culture-positive for the same commensal.

**Infection at another site:**

In Criteria's 1 or 2 in order to make the determination of a CLABSI you must ensure that the organism cultured from the blood is not related to an infection at another site. Look at non-blood culture results to see if the organism cultured in the blood is the same as an organism cultured from a different source. In addition, refer to NHSN manual, Chapter 17 to see if the signs or symptoms a patient is having meet the NHSN criteria for an infection. If so, the organism cultured from the blood would be related to an infection at another site and would not meet NHSN criteria for a CLABSI.

**Other Considerations:**

Patient has a peripheral IV and central line (CL) in place at the same time:

Primary BSI attributed to peripheral line and not the central line if pus at the peripheral line insertion site matches the blood pathogen.

Cather tip cultures

Purulent phlebitis confirmed with a positive semiquantitative culture of a catheter tip, but with either negative or no blood culture is considered a cardiovascular system- venous arterial system related infection, not a BSI or CLABSI.

Localized infection at Central Line site:

A positive blood culture and localized infection at the central line site and no other infection would be considered a primary BSI.

For further details refer to the Device-associated CLABSI module

# VAP

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| healthcare-associated infection | pneumonia that is ventilator-associated | VAP | | AHRQ<br><br>NHSN |

| implementation guidance |
|---|
| NHSN guidance included on the next few pages. |

| examples |
|---|
| |

# Ventilator-Associated Pneumonia (VAP) Event

**Introduction:** In 2002, an estimated 250,000 healthcare-associated pneumonias developed in U.S. hospitals and 36,000 of these were associated with deaths.[1]Patients with mechanically-assisted ventilation have a high risk of developing healthcare-associated pneumonia. From 2006-2007, within NHSN facilities almost 5,400 VAPs were reported and incidence for various types of hospital units ranged from 2.1-11.0 per 1,000 ventilator days.[1]

Prevention and control of healthcare-associated pneumonia is discussed in the CDC/HICPAC document, *Guidelines for Prevention of Healthcare-Associated Pneumonia, 2003*[2]. The Guideline strongly recommends that surveillance be conducted for bacterial pneumonia in ICU patients who are mechanically ventilated to facilitate identification of trends and for interhospital comparisons.

**Settings:** Surveillance will occur in any inpatient location where denominator data can be collected, which may include critical/intensive care units (ICU), specialty care areas (SCA), neonatal units, including neonatal intensive care units (NICUs), stepdown units, wards, and long term care units. A complete listing of inpatient locations can be found in Chapter 15.

NOTE: It is not required to monitor for VAPs after the patient is discharged from the facility, however, if discovered, a VAP should be reported to NHSN. No additional ventilator days are reported.

**Requirements:** Surveillance for VAP in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).
**Definitions**: As for all infections reported to NHSN, infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection area not considered healthcare associated. Therefore, infections that become apparent within the first few days of admission must be carefully reviewed to determine whether they should be considered healthcare associated.

Pneumonia (PNEU) is identified by using a combination of radiologic, clinical and laboratory criteria. The following pages outline the various assessment criteria that may be used for meeting the surveillance definition of healthcare-associated pneumonia (Tables 2-5 and Figures 1 and 2). Report PNEUs that are ventilator-associated (i.e., patient was intubated and ventilated at the time of, or within 48 hours before, the onset of the event).

NOTE: There is no minimum period of time that the ventilator must be in place in order for the PNEU to be considered ventilator associated.

Location of attribution: The inpatient location where the patient was assigned on the date of the PNEU event, which is further defined as the date when the first clinical evidence appeared or the date the specimen used to meet the PNEU criterion was collected, whichever came first.
EXAMPLE: Patient is intubated and ventilated in the Operating Room and then is admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for PNEU. This is

reported to NHSN as a VAP for the MICU, because the Operating Room is not an inpatient location and no denominator data are collected there.

TRANSFER RULE EXCEPTION: If a VAP develops within 48 hours of transfer from one inpatient location to another in the same facility or a new facility,, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below:

- Patient on a ventilator in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for PNEU. This is reported to NHSN as a VAP for the SICU.
- Patient is transferred to the medical ward from the MSICU after having ventilator removed. Within 24 hours, the patient meets criteria for a PNEU. This is reported to NHSN as a VAP for the MSICU.
- Patient on a ventilator is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for a PNEU. This is reported to NHSN as a VAP for the CCU.
- Patient on the Respiratory ICU (RICU) of Hospital A had the endotracheal tube and ventilator removed and is discharged home a few hours later. The ICP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a PNEU. This VAP should be reported to NHSN for, and by, Hospital A and attributed to the RICU. No additional ventilator days are reported.

Ventilator: A device to assist or control respiration continuously, inclusive of the weaning period, through a tracheostomy or by endotracheal intubation.

NOTE: Lung expansion devices such as intermittent positive-pressure breathing (IPPB); nasal positive end-expiratory pressure (PEEP); and continuous nasal positive airway pressure (CPAP, hypoCPAP) are not considered ventilators unless delivered via tracheostomy or endotracheal intubation (e.g., ET-CPAP).

General Comments Applicable to All Pneumonia Specific Site Criteria:

1. Physician's diagnosis of pneumonia alone is not an acceptable criterion for healthcare-associated pneumonia.
2. Although specific criteria are included for infants and children, pediatric patients may meet any of the other pneumonia specific site criteria.
3. Ventilator-associated pneumonia (i.e., pneumonia in persons who had a device to assist or control respiration continuously through a tracheostomy or by endotracheal intubation within the 48-hour period before the onset of infection, inclusive of the weaning period) should be so designated when reporting data.
4. When assessing a patient for presence of pneumonia, it is important to distinguish between changes in clinical status due to other conditions such as myocardial infarction, pulmonary embolism, respiratory distress syndrome, atelectasis, malignancy, chronic obstructive pulmonary disease, hyaline membrane disease, bronchopulmonary dysplasia, etc. Also, care must be taken when assessing intubated patients to distinguish between tracheal colonization, upper respiratory tract infections (e.g., tracheobronchitis), and early onset pneumonia. Finally, it should be recognized that it may be difficult to determine healthcare-associated pneumonia in the elderly, infants, and immunocompromised patients since such conditions

may mask typical signs or symptoms associated with pneumonia. Alternate specific criteria for the elderly, infants and immunocompromised patients have been included in this definition of healthcare-associated pneumonia.

5. Healthcare-associated pneumonia can be characterized by its onset: early or late. Early onset pneumonia occurs during the first four days of hospitalization and is often caused by *Moraxella catarrhalis, H. influenzae,* and *S. pneumoniae*. Causative agents of late onset pneumonia are frequently gram negative bacilli or *S. aureus*, including methicillin-resistant *S. aureus*. Viruses (e.g., Influenza A and B or Respiratory Syncytial Virus) can cause early and late onset healthcare-associated pneumonia, whereas yeasts, fungi, legionellae, and *Pneumocystis carinii* are usually pathogens of late onset pneumonia.
6. Pneumonia due to gross aspiration (for example, in the setting of intubation in the emergency room or operating room) is considered healthcare-associated if it meets any specific criteria and was not clearly present or incubating at the time of admission to the hospital.
7. Multiple episodes of healthcare-associated pneumonia may occur in critically ill patients with lengthy hospital stays. When determining whether to report multiple episodes of healthcare-associated pneumonia in a single patient, look for evidence of resolution of the initial infection. The addition of or change in pathogen alone is not indicative of a new episode of pneumonia. The combination of new signs and symptoms and radiographic evidence or other diagnostic testing is required.
8. Positive Gram stain for bacteria and positive KOH (potassium hydroxide) mount for elastin fibers and/or fungal hyphae from appropriately collected sputum specimens are important clues that point toward the etiology of the infection. However, sputum samples are frequently contaminated with airway colonizers and therefore must be interpreted cautiously. In particular, *Candida* is commonly seen on stain, but infrequently causes healthcare-associated pneumonia.

***Table 1: Abbreviations used in PNEU laboratory criteria***

| | |
|---|---|
| BAL – bronchoalveolar lavage | LRT – lower respiratory tract |
| EIA – enzyme immunoassay | PCR – polymerase chain reaction |
| FAMA – fluorescent-antibody staining of membrane antigen | PMN – polymorphonuclear leukocyte |
| IFA – immunofluorescent antibody | RIA − radioimmunoassay |

REPORTING INSTRUCTIONS:

- There is a hierarchy of specific categories within the major site pneumonia. Even if a patient meets criteria for more than one specific site, report only one:
    - If a patient meets criteria for both PNU1 and PNU2, report PNU2
    - If a patient meets criteria for both PNU2 and PNU3, report PNU3
    - If a patient meets criteria for both PNU1 and PNU3, report PNU3
- Report concurrent lower respiratory tract infection (e.g., abscess or empyema) and pneumonia with the same organism(s) as pneumonia
- Lung abscess or empyema without pneumonia are classified as LUNG
- Bronchitis, tracheitis, tracheobronchitis, or bronchiolitis without pneumonia are classified as BRON.

***Table 2: Specific Site Algorithms for Clinically Defined Pneumonia (PNU1)***

| Radiology | Signs/Symptoms/Laboratory |
|---|---|
| Two or more serial chest radiographs with at least **one** of the following[1,2]:<br><br>New or progressive and persistent infiltrate<br><br>Consolidation<br><br>Cavitation<br><br>Pneumatoceles, in infants ≤ 1 year old<br><br>NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), one definitive chest radiograph is acceptable.[1] | FOR ANY PATIENT, at least **one** of the following:<br><br>-Fever (>38°C or >100.4°F) with no other recognized cause<br>-Leukopenia (<4000 WBC/mm$^3$) or leukocytosis (≥12,000 WBC/mm$^3$)<br>-For adults ≥70 years old, altered mental status with no other recognized cause<br><br>**and**<br>at least **two** of the following:<br><br>-New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements<br>-New onset or worsening cough, or dyspnea, or tachypnea[5]<br>-Rales[6] or bronchial breath sounds<br>-Worsening gas exchange (e.g. $O_2$ desaturations (e.g., $PaO_2/FiO_2 \leq 240$)[7], increased oxygen requirements, or increased ventilator demand) |
| | ALTERNATE CRITERIA, for infants ≤1 year old:<br><br>Worsening gas exchange (e.g., $O_2$ desaturations [e.g. pulse oximetry < 94%], increased oxygen requirements, or increased ventilator demand)<br><br>**and**<br>at least **three** of the following:<br><br>-Temperature instability with no other recognized cause<br>-Leukopenia (<4000 WBC/mm$^3$) or leukocytosis (≥15,000 WBC/mm$^3$) and left shift (≥10% band forms)<br>-New onset of purulent sputum[3] or change in character of sputum[4], or increased respiratory secretions or increased suctioning requirements<br>-Apnea, tachypnea[5], nasal flaring with retraction of chest wall or grunting<br>-Wheezing, rales[6], or rhonchi<br>-Cough<br>-Bradycardia (<100 beats/min) or tachycardia (>170 beats/min) |
| | ALTERNATE CRITERIA, for child >1 year old or ≤ 12 years old, at least **three** of the following:<br><br>-Fever (>38.4°C or >101.1°F) or hypothermia (<36.5°C or <97.7°F) with no other recognized cause<br>-Leukopenia (<4000 WBC/mm$^3$) or leukocytosis (≥15,000 WBC/mm$^3$)<br>-New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements<br>-New onset or worsening cough, or dyspnea, apnea, or tachypnea[5].<br>-Rales[6] or bronchial breath sounds.<br>-Worsening gas exchange (e.g. $O_2$ desaturations [e.g. pulse oximetry < 94%], increased oxygen requirements, or increased ventilator demand) |

***Table 3: Specific Site Algorithms for Pneumonia with Common Bacterial or Filamentous Fungal Pathogens and Specific Laboratory Findings (PNU2)***

| Radiology | Signs/Symptoms | Laboratory |
|---|---|---|
| Two or more serial chest radiographs with at least one of the following[1,2]:<br><br>New or progressive and persistent infiltrate<br><br>Consolidation<br><br>Cavitation<br><br>Pneumatoceles, in infants ≤ 1 year old<br><br>NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), one definitive chest radiograph is acceptable.[1] | At least **one** of the following:<br><br>Fever (>38°C or >100.4°F) with no other recognized cause<br><br>Leukopenia (<4000 WBC/$mm^3$) or leukocytosis (≥12,000 WBC/$mm^3$)<br><br>For adults ≥70 years old, altered mental status with no other recognized cause<br><br>**and**<br><br>at least **one** of the following:<br><br>New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements<br><br>New onset or worsening cough, or dyspnea or tachypnea[5]<br><br>Rales[6] or bronchial breath sounds<br><br>Worsening gas exchange (e.g. $O_2$ desaturations [e.g., $PaO_2/FiO_2 \leq 240$][7], increased oxygen requirements, or increased ventilator demand) | At least **one** of the following:<br><br>Positive growth in blood culture[8] not related to another source of infection<br><br>Positive growth in culture of pleural fluid<br><br>Positive quantitative culture[9] from minimally contaminated LRT specimen (e.g., BAL or protected specimen brushing)<br><br>≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (e.g., Gram stain)<br><br>Histopathologic exam shows at least **one** of the following evidences of pneumonia:<br><br>Abscess formation or foci of consolidation with intense PMN accumulation in bronchioles and alveoli<br><br>Positive quantitative culture[9] of lung parenchyma<br>Evidence of lung parenchyma invasion by fungal hyphae or pseudohyphae |

***Table 4: Specific Site Algorithms for Viral, Legionella, and other Bacterial Pneumonias with Definitive Laboratory Findings (PNU2)***

| Radiology | Signs/Symptoms | Laboratory |
|---|---|---|
| Two or more serial chest radiographs with at least one of the following[1,2]:<br><br>New or progressive and persistent infiltrate<br><br>Consolidation<br><br>Cavitation<br><br>Pneumatoceles, in infants ≤ 1 year old<br><br>NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), one definitive chest radiograph is acceptable.[1] | At least **one** of the following:<br><br>Fever (>38°C or >100.4°F) with no other recognized cause<br><br>Leukopenia (<4000 WBC/$mm^3$) or leukocytosis (≥12,000 WBC/$mm^3$)<br><br>For adults ≥70 years old, altered mental status with no other recognized cause<br><br>**and**<br><br>at least one of the following:<br><br>New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements<br><br>New onset or worsening cough or dyspnea, or tachypnea[5]<br><br>Rales[6] or bronchial breath sounds<br><br>Worsening gas exchange (e.g. $O_2$ desaturations [e.g., $PaO_2/FiO_2 \leq 240$][7], increased oxygen requirements, or increased ventilator demand) | At least **one** of the following[10-12]:<br><br>Positive culture of virus or *Chlamydia* from respiratory secretions<br><br>Positive detection of viral antigen or antibody from respiratory secretions (e.g., EIA, FAMA, shell vial assay, PCR)<br><br>Fourfold rise in paired sera (IgG) for pathogen (e.g., influenza viruses, *Chlamydia*)<br><br>Positive PCR for *Chlamydia* or *Mycoplasma*<br><br>Positive micro-IF test for *Chlamydia*<br><br>Positive culture or visualization by micro-IF of *Legionella* spp, from respiratory secretions or tissue.<br><br>Detection of *Legionella pneumophila* serogroup 1 antigens in urine by RIA or EIA<br><br>Fourfold rise in *L. pneumo*phila serogroup 1 antibody titer to ≥1:128 in paired acute and convalescent sera by indirect IFA. |

***Table 5: Specific Site Algorithm for Pneumonia in Immunocompromised Patients (PNU3)***

| Radiology | Signs/Symptoms | Laboratory |
|---|---|---|
| Two or more serial chest radiographs with at least <u>one</u> of the following[1,2]:<br><br>New or progressive <u>and</u> persistent infiltrate<br><br>Consolidation<br><br>Cavitation<br><br>Pneumatoceles, in infants ≤ 1 year old<br><br>NOTE: In patients **without** underlying pulmonary or cardiac disease (e.g. respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), <u>one</u> <u>definitive</u> chest radiograph is acceptable.[1] | Patient who is immunocompromised[13] has at least **<u>one</u>** of the following:<br><br>Fever (>38°C or >100.4°F) with no other recognized cause<br><br>For adults <u>≥</u>70 years old, altered mental status with no other recognized cause<br><br>New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements<br><br>New onset or worsening cough, or dyspnea, or tachypnea[5]<br><br>Rales[6] or bronchial breath sounds<br><br>Worsening gas exchange (e.g. $O_2$ desaturations [e.g., $PaO_2/FiO_2$ <u>≤</u> 240][7], increased oxygen requirements, or increased ventilator demand)<br><br>Hemoptysis<br><br>Pleuritic chest pain | At least **<u>one</u>** of the following:<br><br>Matching positive blood and sputum cultures with *Candida* spp. [14, 15]<br><br>Evidence of fungi or *Pneumocystis carinii* from minimally contaminated LRT specimen (e.g., BAL or protected specimen brushing) from one of the following:<br><br>- Direct microscopic exam<br>- Positive culture of fungi<br><br>Any of the following from<br><br>**LABORATORY CRITERIA DEFINED UNDER PNU2** |

Footnotes to Algorithms:

1. Occasionally, in nonventilated patients, the diagnosis of healthcare-associated pneumonia may be quite clear on the basis of symptoms, signs, and a single definitive chest radiograph. However, in patients with pulmonary or cardiac disease (for example, interstitial lung disease or congestive heart failure), the diagnosis of pneumonia may be particularly difficult. Other non-infectious conditions (for example, pulmonary edema from decompensated congestive heart failure) may simulate the presentation of pneumonia. In these more difficult cases, serial chest radiographs must be examined to help separate infectious from non-infectious pulmonary processes. To help confirm difficult cases, it may be useful to review radiographs on the day of diagnosis, 3 days prior to the diagnosis and on days 2 and 7 after the diagnosis. Pneumonia may have rapid onset and progression, but does not resolve quickly. Radiographic changes of pneumonia persist for several weeks. As a result, rapid radiographic resolution suggests that the patient does <u>not</u> have pneumonia, but rather a non-infectious process such as atelectasis or congestive heart failure.
2. Note that there are many ways of describing the radiographic appearance of pneumonia. Examples include, but are not limited to, “air-space disease”, “focal opacification”, “patchy areas of increased density”. Although perhaps not specifically delineated as pneumonia by the radiologist, in the appropriate clinical setting these alternative descriptive wordings should be seriously considered as potentially positive findings.

3. Purulent sputum is defined as secretions from the lungs, bronchi, or trachea that contain ≥25 neutrophils and ≤10 squamous epithelial cells per low power field (x100). If your laboratory reports these data qualitatively (e.g., "many WBCs" or "few squames"), be sure their descriptors match this definition of purulent sputum. This laboratory confirmation is required since written clinical descriptions of purulence are highly variable.
4. A single notation of either purulent sputum or change in character of the sputum, is not meaningful; repeated notations over a 24 hour period would be more indicative of the onset of an infectious process. Change in character of sputum refers to the color, consistency, odor and quantity.
5. In adults, tachypnea is defined as respiration rate >25 breaths per minute. Tachypnea is defined as >75 breaths per minute in premature infants born at <37 weeks gestation and until the $40^{th}$ week; >60 breaths per minute in patients <2 months old; >50 breaths per minute in patients 2-12 months old; and >30 breaths per minute in children >1 year old.
6. Rales may be described as "crackles".
7. This measure of arterial oxygenation is defined as the ratio of the arterial tension ($PaO_2$) to the inspiratory fraction of oxygen ($FiO_2$).
8. Care must be taken to determine the etiology of pneumonia in a patient with positive blood cultures and radiographic evidence of pneumonia, especially if the patient has invasive devices in place such as intravascular lines or an indwelling urinary catheter. In general, in an immunocompetent patient, blood cultures positive for coagulase negative staphylococci, common skin contaminants, and yeasts will not be the etiologic agent of the pneumonia.
9. Refer to Threshold values for cultured specimens (Table 6). An endotracheal aspirate is not a minimally contaminated specimen. Therefore, an endotracheal aspirate does not meet the laboratory criteria.
10. Once laboratory-confirmed cases of pneumonia due to respiratory syncytial virus (RSV), adenovirus, or influenza virus have been identified in a hospital, clinician's presumptive diagnosis of these pathogens in subsequent cases with similar clinical signs and symptoms is an acceptable criterion for presence of healthcare-associated infection.
11. Scant or watery sputum is commonly seen in adults with pneumonia due to viruses and *Mycoplasma* although sometimes the sputum may be mucopurulent. In infants, pneumonia due to RSV or influenza yields copious sputum. Patients, except premature infants, with viral or mycoplasmal pneumonia may exhibit few signs or symptoms, even when significant infiltrates are present on radiographic exam.
12. Few bacteria may be seen on stains of respiratory secretions from patients with pneumonia due to *Legionella* spp, mycoplasma, or viruses.
13. Immunocompromised patients include those with neutropenia (absolute neutrophil count <500/$mm^3$), leukemia, lymphoma, HIV with CD4 count <200, or splenectomy; those who are early post-transplant, are on cytotoxic chemotherapy, or are on high dose steroids (e.g., >40mg of prednisone or its equivalent (>160mg hydrocortisone, >32mg methylprednisolone, >6mg dexamethasone, >200mg cortisone) daily for >2weeks).
14. Blood and sputum specimens must be collected within 48 hours of each other.
15. Semiquantitative or nonquantitative cultures of sputum obtained by deep cough, induction, aspiration, or lavage are acceptable. If quantitative culture results are available, refer to algorithms that include such specific laboratory findings

**Figure 1: Pneumonia Flow Diagram**

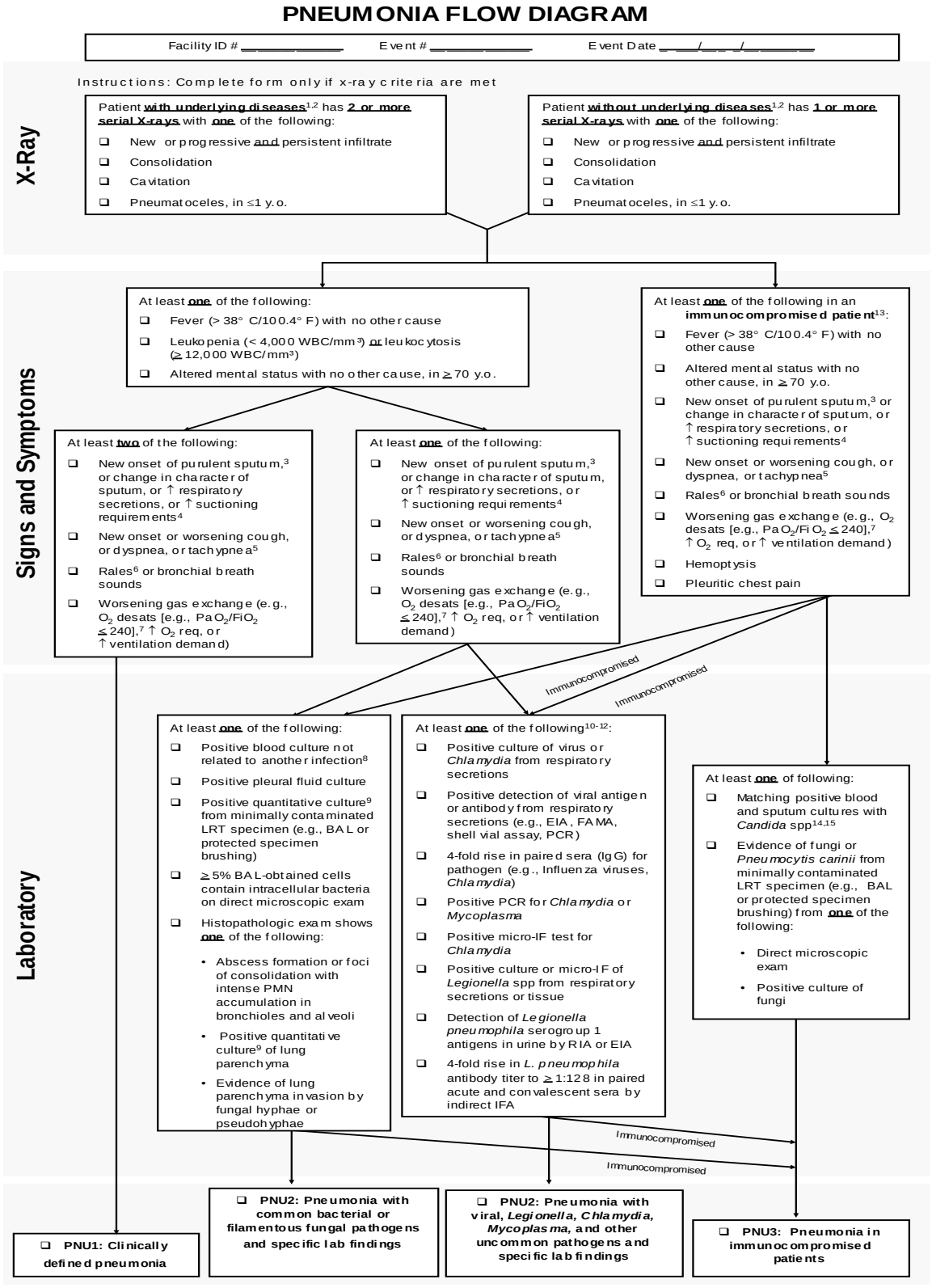

**Figure 2: Pneumonia Flow Diagram, Alternative Criteria for Infants and Children**

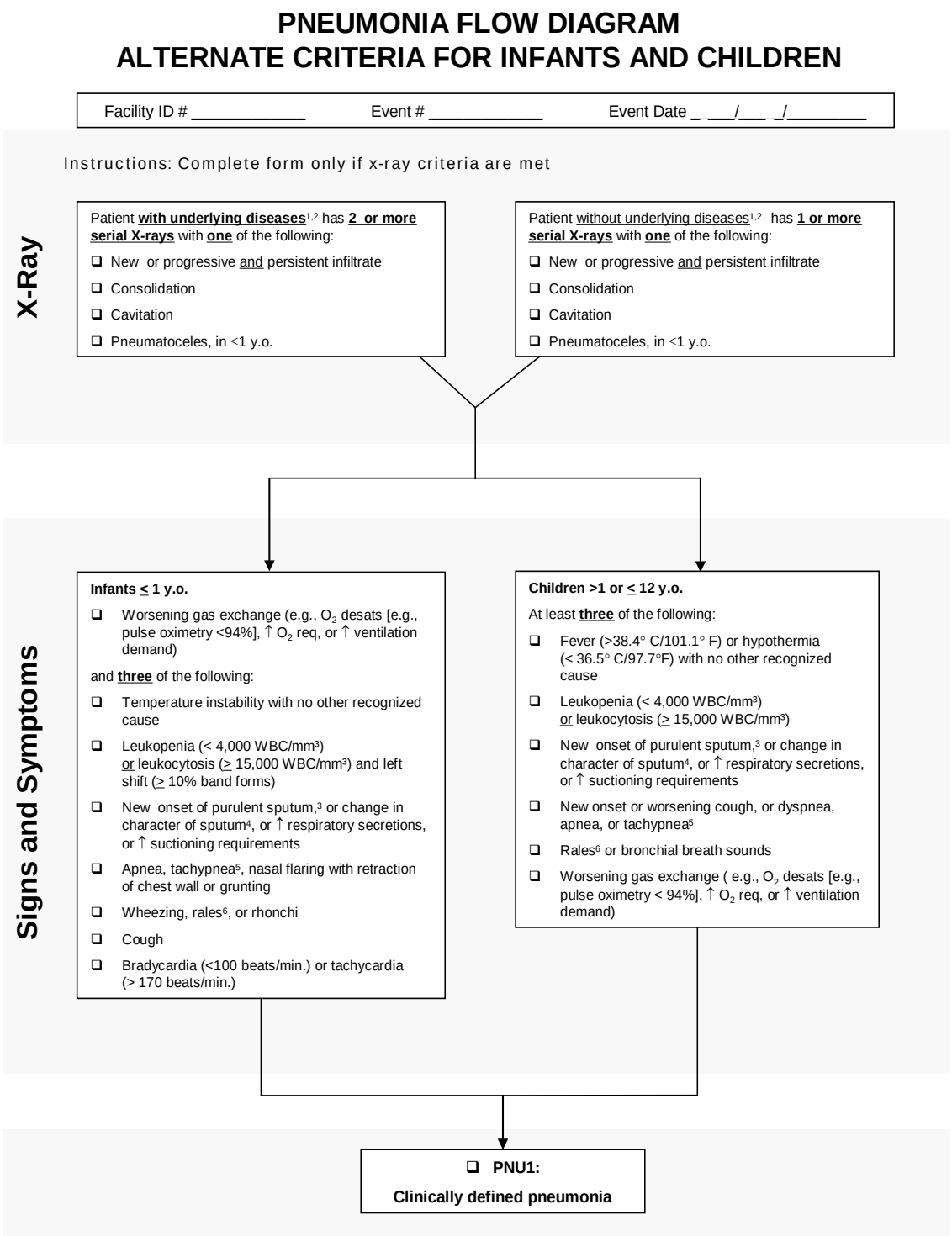

***Table 6: Threshold values for cultured specimens used in the diagnosis of pneumonia***

| **Specimen collection/technique** | **Values** |
|---|---|
| Lung parenchyma* | $\geq 10^4$ cfu/g tissue |
| | |
| Bronchoscopically (B) obtained specimens | |
| Bronchoalveolar lavage (B-BAL) | $\geq 10^4$ cfu/ml |
| Protected BAL (B-PBAL) | $\geq 10^4$ cfu/ml |
| Protected specimen brushing (B-PSB) | $\geq 10^3$ cfu/ml |
| | |
| Nonbronchoscopically (NB) obtained (blind) specimens | |
| NB-BAL | $>10^4$ cfu/ml |
| NB-PSB | $\geq 10^3$ cfu/ml |

cfu = colony forming units
g = gram
ml = milliliter

COMMENT:
* Open-lung biopsy specimens and immediate post-mortem specimens obtained by transthoracic or transbronchial biopsy

**Numerator Data:** The *Pneumonia (PNEU)* from (CDC 57.111) is used to collect and report each VAP that is identified during the month selected for surveillance. The *Instructions for Completion of Pneumonia Form* (Tables of Instructions, Tables 4 and 2a) includes brief instructions for collection and entry of each data element on the form. The pneumonia form includes patient demographic information and information on whether or not mechanically assisted ventilation was present. Additional data include the specific criteria met for identifying pneumonia, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

**Denominator data:** Device days and patient days are used for denominators (see Chapter 16 Key Terms). Ventilator days, which are the number of patients managed with a ventilatory device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.116, 57.117, and 57.118). These daily counts are summed and only the total for the month is entered into NHSN. Ventilator and patient days are collected for each of the locations monitored. When denominator data are available from electronic sources (e.g., ventilator days from respiratory therapy),

these sources may be used as long as the counts are not substantially different (+/- 5%) from manually collected counts.

**Data Analyses:** The SIR is calculated by dividing the number of observed infections by the number of expected infections. The number of expected infections, in the context of statistical prediction, is calculated using PNEU rates from a standard population during a baseline time period as reported in the NHSN Report.

**NOTE: The SIR will be calculated only if the number of expected HAIs (numExp) is ≥ 1.**

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

While the PNEU SIR can be calculated for single locations, the measure also allows you to summarize your data by multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you will be able to obtain one PNEU SIR adjusting for all locations reported. Similarly, you can obtain one PNEU SIR for all specialty care areas in your facility.

The VAP rate per 1000 ventilator days is calculated by dividing the number of VAPs by the number of ventilator days and multiplying the result by 1000. The Ventilator Utilization Ratio is calculated by dividing the number of ventilator days by the number of patient days. These calculations will be performed separately for the different types of ICUs, SCAs, and other locations in the institution, as well as by each birthweight category in NICUs.

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[1]Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[2]Centers for Disease Control and Prevention. Guidelines for preventing health-care-associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. MMWR 2004;53(No. RR-3).

# SSI

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| healthcare-associated infection | surgical site infection | SSI | Results in serious physical injury ,death or higher level of care including but not limited to prolonged hospital stay, IV antibiotics | AHRQ<br><br>NHSN |

| implementation guidance |
|---|
| There will be surgical site infections that are reported to NHSN but are NOT sentinel events.<br><br>NHSN guidance included on the next few pages. |

| examples |
|---|
| *not a sentinel event*: A 41 year-old male presents to hospital to have an ankle fusion. The fusion is done successfully. At day 2 prior to discharge, the wound is noted to be red, painful, and warm to the touch. There is neither purulence nor fluctuation. The patient is treated with post-operative Keflex and discharged. Patient follow up with the surgeon reveals a well-healed wound. This would meet the definition of a superficial, incisional SSI but not a sentinel event. |

# Surgical Site Infection (SSI) Event

**Introduction:** In 2002, in the United States, an estimated 14 million NHSN operative procedures were performed (CDC unpublished data). SSIs were the second most common healthcare-associated infection, accounting for 17% of all HAIs among hospitalized patients[1]. A similar rate was obtained from NHSN hospitals reporting data in 2006-2008 (15,862 SSI following 830,748 operative procedures) (CDC, unpublished data) with an overall rate of nearly 2%.

While advances have been made in infection control practices, including improved operating room ventilation, sterilization methods, barriers, surgical technique, and availability of antimicrobial prophylaxis, SSIs remain a substantial cause of morbidity and mortality among hospitalized patients. In one study, among nearly 100,000 HAIs reported in one year, deaths were associated with SSIs in more than 8,000 cases.[2]

Surveillance of SSI with feedback of appropriate data to surgeons has been shown to be an important component of strategies to reduce SSI risk.[3,4,5,6,7] A successful surveillance program includes the use of epidemiologically-sound infection definitions and effective surveillance methods, stratification of SSI rates according to risk factors associated with SSI development, and data feedback.[4,5] Recommendations are outlined in the CDC's *Guideline for Prevention of Surgical Site Infection, 1999.*[7]

**Settings:** Surveillance will occur with surgical patients in any inpatient/outpatient setting where the selected NHSN operative procedure(s) are performed.

**Requirements:** Select at least one NHSN operative procedure category (Table 1) and indicate this on the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Collect numerator and denominator data on all selected procedure categories for at least one month.

The *International Classification of Diseases, 9th Revision Clinical Modifications* (ICD-9-CM) codes, which are defined by the ICD-9 Coordination and Maintenance Committee of the National Center for Health Statistics and the Centers for Medicare and Medicaid Services (CMS), are developed as a tool for classification of morbidity data. The preciseness of the data, as well as their wide use, allows their use in grouping surgery types for the purpose of determining SSI rates. ICD-9-CM codes are updated annually in October and NHSN operative procedure categories are subsequently updated and changes shared with NHSN users. Table 1: NHSN Operative Procedure Category Mappings to ICD-9-CM Codes, below, outlines operative procedures and their grouping into NHSN operative procedure categories according to ICD-9-CM codes. A brief description of the types of operations contained in the NHSN operative procedure categories is also provided.

**Table 1. NHSN Operative Procedure Category Mappings to ICD-9-CM Codes**

| Legacy Code | Operative Procedure | Description | ICD-9-CM Codes |
|---|---|---|---|
| AAA | Abdominal aortic aneurysm repair | Resection of abdominal aorta with anastomosis or replacement | 38.34, 38.44, 38.64 |
| AMP | Limb amputation | Total or partial amputation or disarticulation of the upper or lower limbs, including digits | 84.00-84.19, 84.91 |
| APPY | Appendix surgery | Operation of appendix (not incidental to another procedure) | 47.01, 47.09, 47.2, 47.91, 47.92, 47.99 |
| AVSD | Shunt for dialysis | Arteriovenostomy for renal dialysis | 39.27, 39.42 |
| 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, 51.91-51.95, 51.99, 52.09, 52.12, 52.22, 52.3**,** 52.4, 52.51-52.53, 52.59-52.6, 52.7, 52.92, 52.95, 52.96, 52.99 |
| 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, 85.53-85.55, 85.6, 85.70-85.76, 85.79, 85.93-85.96 |
| 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, 35.31-35.35, 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, 37.10-37.12, 37.31-37.33, 37.35-37.37, 37.41, 37.49, 37.60***** |
| CEA | Carotid endarterectomy | Endarterectomy on vessels of head and neck (includes carotid artery and jugular vein) | 38.12 |

| Legacy Code | Operative Procedure | Description | ICD-9-CM Codes |
|---|---|---|---|
| CBGB | Coronary artery bypass graft with **both** chest and donor site incisions | Chest procedure to perform direct revascularization of the heart; includes obtaining suitable vein from donor site for grafting. | 36.10-36.14, 36.19 |
| CBGC | Coronary artery bypass graft with chest incision only | Chest procedure to perform direct vascularization of the heart using, for example the internal mammary (thoracic) artery | 36.15-36.17, 36.2 |
| CHOL | Gallbladder surgery | Cholecystectomy and cholecystotomy | 51.03, 51.04, 51.13, 51.21-51.24 |
| 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 |
| CRAN | Craniotomy | Excision repair, or exploration of the brain or meninges; does not include taps or punctures | 01.12, 01.14, 01.20-01.25, 01.28, 01.29, 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 |
| CSEC | Cesarean section | Obstetrical delivery by Cesarean section | 74.0, 74.1, 74.2, 74.4, 74.91, 74.99 |
| FUSN | Spinal fusion | Immobilization of spinal column | 81.00-81.08 |
| FX | Open reduction of fracture | Open reduction of fracture or dislocation of long bones with or without 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 |
| 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 |

| Legacy Code | Operative Procedure | Description | ICD-9-CM Codes |
|---|---|---|---|
| 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 |
| HPRO | Hip prosthesis | Arthroplasty of hip | 00.70-00.73, 00.85-00.87, 81.51-81.53 |
| HTP | Heart transplant | Transplantation of heart | 37.51-37.55 |
| HYST | Abdominal hysterectomy | Abdominal approach with uterine removal | 68.31, 68.39, 68.41, 68.49, 68.61, 68.69 |
| KPRO | Knee prosthesis | Arthroplasty of knee | 00.80-00.84, 81.54, 81.55 |
| KTP | Kidney transplant | Transplantation of kidney | 55.61, 55.69 |
| 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 |
| LTP | Liver transplant | Transplantation of liver | 50.51, 50.59 |
| 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 |
| 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 |
| OVRY | Ovarian surgery | Operations on ovary and related structures | 65.01, 65.09, 65.12, 65.13, 65.21-65.25, 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 |
| PACE | Pacemaker surgery | Insertion, manipulation or replacement of pacemaker | 00.50-00.54, 17.51, 17.52, 37.70-37.77, 37.79-37.83, 37.85-37.87, 37.89, 37.94-37.99 |
| PRST | Prostate surgery | Suprapubic, retropubic, radical, or perineal excision of the prostate; does not include transurethral | 60.12, 60.3, 60.4, 60.5, 60.61, 60.62, 60.69 |

| Legacy Code | Operative Procedure | Description | ICD-9-CM Codes |
|---|---|---|---|
| | | resection of the prostate. | |
| PVBY | Peripheral vascular bypass surgery | Bypass operations on peripheral arteries | 39.29 |
| 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 |
| RFUSN | Refusion of spine | Refusion of spine | 81.30-81.39 |
| 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 |
| SPLE | Spleen surgery | Resection or manipulation of spleen | 41.2, 41.33, 41.41-41.43, 41.5, 41.93, 41.95, 41.99 |
| THOR | Thoracic surgery | Noncardiac, nonvascular thoracic surgery; includes pneumonectomy and hiatal hernia repair or diaphragmatic hernia repair (except through abdominal approach.) | 32.09, 32.1, 32.20-32.23, 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 |
| 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 |
| VHYS | Vaginal hysterectomy | Vaginal approach with uterine removal | 68.51, 68.59, 68.71, 68.79 |
| 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^ |
| XLAP | Abdominal surgery | Abdominal operations not involving the gastrointestinal tract or biliary system includes diaphragmatic hernia repair through abdominal approach. | 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, 54.71-54.75, 54.92, 54.93 |

*****NOTE: The procedure represented by this ICD-9-CM code can be performed in a number of ways. However, as for all surgeries, if, at the end of the procedure, the skin incision edges do not meet because of wires, devices or other objects extruding through the incision, the incision is not considered primarily closed. Therefore the procedure is not considered an NHSN operative procedure and any subsequent infection is not considered a procedure-associated infection (i.e., not an SSI or PPP).

†NOTE: If this procedure is performed percutaneously, it is not considered an NHSN operative procedure and should not be included in LAM denominator data.

^ NOTE: Include only if this procedure involves ventricular shunt.

For a complete mapping of all ICD-9-CM codes to their assignment as an NHSN operative procedure category, a surgical procedure other than an NHSN operative procedure (OTH), or a non-operative procedure (NO), see ICD-9-CM Procedure Code Mapping to NHSN Operative Procedure Categories at http://www.cdc.gov/nhsn/library.html.

**Definitions:**

An NHSN operative procedure is a procedure

1) that is performed on a patient who is an NHSN inpatient or an NHSN outpatient; 2) takes place during an operation (defined as a single trip to the operating room (OR) where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the OR; and 3) that is included in Table 1.

*****NOTE: If the skin incision edges do not meet because of wires or devices or other objects extruding through the incision, the incision is not considered primarily closed and therefore the procedure is not considered an operation. Further, any subsequent infection is not considered a procedure-associated infection (i.e., not an SSI or PPP).

NHSN Inpatient: A patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.

NHSN Outpatient: A patient whose date of admission to the healthcare facility and date of discharge are the same calendar day.

Operating Room (OR): A patient care area that met the Facilities Guidelines Institute's (FGI) or American Institute of Architects' (AIA) criteria for an operating room when it was constructed or renovated.[7] This may include an operating room, C-Section room, interventional radiology room, or a cardiac catheterization lab.

Implant: A nonhuman-derived object, material, or tissue that is permanently placed in a patient during an operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes. Examples include: porcine or synthetic heart valves, mechanical heart, metal rods, mesh, sternal wires, screws, cements, internal staples, hemoclips, and other devices. Non-absorbable

sutures are excluded because Infection Preventionists may not easily identify and/or differentiate the soluble nature of suture material used.

Transplant: Human cells, tissues, organs, or cellular- or tissue-based products that are placed into a human recipient via grafting, infusion, or transfer. Examples include: heart valves, organs, ligaments, bone, blood vessels, skin, corneas, and bone marrow cells.
*Autologous* or "autograft" transplants are products that originate from the patient's own body.
*Non-autologous* or "allograft" transplants are tissues or other products derived from another human body, either a donor cadaver or a live donor.

REPORTING INSTRUCTIONS:

- Some products are a combination of human- and nonhuman-derived materials, such as demineralized human bone matrix with porcine gel carrier. When placed in a patient during an operative procedure, indicate "Yes" for both the Implant and Non-autologous Transplant fields.
- Some operative procedures involve placement of both autologous and non-autologous products. For these procedures, indicate "Yes" for Non-autologous Transplant field.

A **superficial incisional SSI** must meet one of the following criteria:

Infection occurs within 30 days after the operative procedure
and
involves only skin and subcutaneous tissue of the incision
and
patient has at least one of the following:

a. purulent drainage from the superficial incision.
b. organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
c. at least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat, and superficial incision is deliberately opened by surgeon, and is culture-positive or not cultured. A culture-negative finding does not meet this criterion.
d. diagnosis of superficial incisional SSI by the surgeon or attending physician.

NOTE: There are two specific types of superficial incisional SSIs:

1. Superficial Incisional Primary (SIP) – a superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB)
2. Superficial Incisional Secondary (SIS) – a superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site [leg] incision for CBGB)

REPORTING INSTRUCTIONS:

- Do not report a stitch abscess (minimal inflammation and discharge confined to the points of suture penetration) as an infection.

- Do not report a localized stab wound infection as SSI. While it would be considered either a skin (SKIN) or soft tissue (ST) infection, depending on its depth, it is not reportable under this module.
- "Cellulitis", by itself, does not meet the criteria for Superficial Incisional SSI.
- If the incisional site infection involves or extends into the fascial and muscle layers, report as a deep-incisional SSI.
- Classify infection that involves both superficial and deep incision sites as deep incisional SSI.
- An infected circumcision site in newborns is classified as CIRC. Circumcision is not an NHSN operative procedure. CIRC is not reportable under this module.
- An infected burn wound is classified as BURN and is not reportable under this module

A **deep incisional SSI** must meet one of the following criteria:
Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure
and
involves deep soft tissues (e.g., fascial and muscle layers) of the incision
and
patient has at least one of the following:

a. purulent drainage from the deep incision but not from the organ/space component of the surgical site
b. a deep incision spontaneously dehisces or is deliberately opened by a surgeon and is culture-positive or not cultured and the patient has at least one of the following signs or symptoms: fever (>38°C), or localized pain or tenderness. A culture-negative finding does not meet this criterion.
c. an abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination
d. diagnosis of a deep incisional SSI by a surgeon or attending physician.

NOTE: There are two specific types of deep incisional SSIs:

1. Deep Incisional Primary (DIP) – a deep incisional SSI that is identified in a primary incision in a patient that has had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB)
2. Deep Incisional Secondary (DIS) – a deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site [leg] incision for CBGB)

REPORTING INSTRUCTIONS:

- Classify infection that involves both superficial and deep incision sites as deep incisional SSI.

An **organ/space SSI** involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure. Specific sites are assigned to organ/space SSI to further identify the location of the infection. The table below lists the specific sites that must be used to differentiate organ/space SSI. An example is appendectomy with

subsequent subdiaphragmatic abscess, which would be reported as an organ/space SSI at the intraabdominal specific site (SSI-IAB). Specific sites of organ/space (Table 2) have specific criteria which must be met in order to qualify as an NHSN event. These criteria are in addition to the general criteria for organ/space SSI and can be found in Chapter 17.

An **organ/space SSI** must meet one of the following criteria:
Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure
and
infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure
and
patient has at least one of the following:

a. purulent drainage from a drain that is placed through a stab wound into the organ/space
b. organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space
c. 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
d. diagnosis of an organ/space SSI by a surgeon or attending physician.

REPORTING INSTRUCTIONS:

- Occasionally an organ/space infection drains through the incision. Such infection generally does not involve reoperation and is considered a complication of the incision. Therefore, classify it as a deep incisional SSI.
- Report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as SSI-MED rather than SSI-BONE.
- If meningitis (MEN) and a brain abscess (IC) are present together after operation, report as SSI-IC.
- Report CSF shunt infection as SSI-MEN if it occurs ≤ 1 year of placement; if later or after manipulation/access, it is considered CNS-MEN and is not reportable under this manual.
- Report spinal abscess with meningitis as SSI-MEN following spinal surgery.
- Episiotomy is not considered an operative procedure in NHSN.

***Table 2. Specific sites of an organ/space SSI***. Criteria for these sites can be found in the NHSN Help System (must be logged in to NHSN) or Chapter 17.

| Code | Site | Code | Site |
|---|---|---|---|
| BONE | Osteomyelitis | JNT | Joint or bursa |
| BRST | Breast abscess or mastitis | LUNG | Other infections of the respiratory tract |
| CARD | Myocarditis or pericarditis | MED | Mediastinitis |
| DISC | Disc space | MEN | Meningitis or ventriculitis |
| EAR | Ear, mastoid | ORAL | Oral cavity (mouth, tongue, or gums) |
| EMET | Endometritis | OREP | Other infections of the male or female reproductive tract |

| Code | Site | Code | Site |
|---|---|---|---|
| ENDO | Endocarditis | OUTI | Other infections of the urinary tract |
| EYE | Eye, other than conjunctivitis | SA | Spinal abscess without meningitis |
| GIT | GI tract | SINU | Sinusitis |
| HEP | Hepatitis | UR | Upper respiratory tract |
| IAB | Intraabdominal, not specified else-where | VASC | Arterial or venous infection |
| IC | Intracranial, brain abscess or dura | VCUF | Vaginal cuff |

**Numerator Data:** All patients having the selected operative procedure are monitored for signs of SSI. The *Surgical Site Infection (SSI)* form (CDC 57.120) is completed for each such patient found to have an SSI.

NOTES:

1. If a patient has several NHSN operative procedures prior to an infection, report the operative procedure code of the operation that was performed most closely in time prior to the infection date, unless there is evidence that the infection is associated with a different operation.
2. If a procedure from more than one NHSN operative procedure category was done through a single incision, attempt to determine the procedure that is thought to be associated with the infection. If it is not clear (as is often the case when the infection is a superficial incisional SSI), or if the infection site being reported is not an SSI, use the NHSN Principal Operative Procedure Category Selection Lists (Table 3) to select which operative procedure to report.

***Table 3. NHSN Principal Operative Procedure Category Selection Lists***

| The following lists are derived from Table 1, NHSN Operative Procedure Categories. The operative procedures with the highest risk of surgical site infection are listed before those with a lower risk. | | |
|---|---|---|
| | | |
| **Priority** | **Code** | **Abdominal Operations** |
| 1 | SB | Small bowel surgery |
| 2 | KTP | Kidney transplant |
| 3 | LTP | Liver transplant |
| 4 | BILI | Bile duct, liver or pancreatic surgery |
| 5 | REC | Rectal surgery |
| 6 | COLO | Colon surgery |
| 7 | GAST | Gastric surgery |
| 8 | CSEC | Cesarean section |
| 9 | SPLE | Spleen surgery |
| 10 | APPY | Appendix surgery |
| 11 | HYST | Abdominal hysterectomy |
| 12 | VHYS | Vaginal Hysterectomy |
| 13 | OVRY | Ovarian surgery |
| 14 | HER | Herniorrhaphy |

| The following lists are derived from Table 1, NHSN Operative Procedure Categories. The operative procedures with the highest risk of surgical site infection are listed before those with a lower risk. | | |
|---|---|---|
| 15 | CHOL | Gall bladder surgery |
| 16 | AAA | Abdominal aortic aneurysm repair |
| 17 | NEPH | Kidney surgery |
| 18 | XLAP | Laparotomy |
| | | |
| **Priority** | **Code** | **Thoracic Operations** |
| 1 | HTP | Heart transplant |
| 2 | CBGB | Coronary artery bypass graft with donor incision(s) |
| 3 | CBGC | Coronary artery bypass graft, chest incision only |
| 4 | CARD | Cardiac surgery |
| 5 | THOR | Thoracic surgery |
| | | |
| **Priority** | **Code** | **Neurosurgical (Spine) Operations** |
| 1 | RFUSN | Refusion of spine |
| 2 | FUSN | Spinal fusion |
| 3 | LAM | Laminectomy |
| | | |
| **Priority** | **Code** | **Neurosurgical (Brain) Operations** |
| 1 | VSHN | Ventricular shunt |
| 2 | CRAN | Craniotomy |
| | | |
| **Priority** | **Code** | **Neck Operations** |
| 1 | NECK | Neck surgery |
| 2 | THYR | Thyroid and or parathyroid surgery |

The *Instructions for Completion of Surgical Site Infection* form (Tables of Instructions, Tables 12 and 2a) includes brief instructions for collection and entry of each data element on the form. The SSI form includes patient demographic information and information about the operative procedure, including the date and type of procedure. Information about the SSI includes the date of SSI, specific criteria met for identifying the SSI, when the SSI was detected, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and the organisms' antimicrobial susceptibilities.

**Denominator Data:** For all patients having a procedure selected for surveillance during the month, complete the *Denominator for Procedure* form (CDC 57.121). The data are collected individually for each operative procedure performed during the month specified on the *Patient Safety Monthly Surveillance Plan* (CDC 57.106). The *Instructions for Completion of Denominator for Procedure* form (Tables of Instructions, Table 13) includes brief instructions for collection and entry of each data element on the form.

NOTES:

1. If procedures in more than one NHSN operative procedure category are performed during the same trip to the OR even if performed through the same incision, a Denominator for Procedure (CDC 57.121) record is reported for each operative procedure being monitored. For example, if a CARD and CBGC are done through the same incision, a *Denominator for Procedure* record is reported for each.
2. EXCEPTION: If a patient has both a CBGC and CBGB during the same trip to the OR, report only as a CBGB. Only report as a CBGC when there is a chest incision only. CBGB and CBGC are never reported for the same patient for the same trip to the OR. For bilateral operative procedures see #4 below.
3. If procedures of different ICD-9-CM codes from the same NHSN Operative Procedure Category are performed through the same incision, record only one procedure for that category. For example, if your facility is performing surveillance for both CBGB and CARD procedures, and a patient undergoes an aortocoronary bypass of one coronary vessel (36.11, CBGB) and the replacement of both the mitral and tricuspid valves (35.23 and 35.27, both CARD) during the same trip to the OR, you would complete a *Denominator for Procedure* record for the CBGB and another for the CARD.
4. If more than one NHSN operative procedure category is performed through the same incision, record the combined duration of all procedures, which is the time from skin incision to primary closure.
5. For bilateral operative procedures (e.g., KPRO), two separate Denominator for Procedure (CDC 57.121) records are completed. To document the duration of the procedure, indicate the incision time to closure time for each procedure separately or, alternatively, take the total time for both procedures and split it evenly between the two. See "5" below.
6. Laparoscopic hernia repairs are considered one procedure, regardless of the number of hernias that are repaired in that trip to the OR. In most cases there will be only one incision time documented for this procedure. If more than one time is documented, total the durations. In this situation, if more than one of the incisions should become infected, only report as a single SSI. Open [i.e., non-laparoscopic] hernia repairs are reported as one procedure for each hernia repaired via a separate incision, i.e., if two incisions are made to repair two defects, then two procedures will be reported. It is anticipated that separate incision times will be recorded for these procedures. If not, take the total time for both procedures and split it evenly between the two.
7. If a patient goes to the OR more than once during the same admission and another procedure is performed through the same incision within 24 hours of the original operative incision, report only one procedure on the *Denominator for Procedure* (CDC 57.121) form combining the durations for both procedures. For example, a patient has a CBGB lasting 4 hours. He returns to the OR six hours later to correct a bleeding vessel. The surgeon reopens the initial incision, makes the repairs, and recloses in 1.5 hours. Record the operative procedure as one CBGB and the duration of operation as 5 hour 30 minutes. If the wound class has changed, report the higher wound class. If the ASA class has changed, report the higher ASA class.

**Data Analyses:** The SIR is calculated by dividing the number of observed infections by the number of expected infections. The number of expected infections, in the context of statistical prediction, is calculated using SSI probabilities estimated from multivariate logistic regression models constructed from NHSN data during a baseline time period to represent a standard population.

**NOTE: The SIR will be calculated only if the number of expected HAIs (numExp) is ≥ 1.**

$$SIR = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

While the SSI SIR can be calculated for single procedure categories, and for specific surgeons, the measure also allows you to summarize your data across multiple procedure categories, while adjusting for differences in the estimated probability of infection among the patients included across the procedure categories. For example, you will be able to obtain one SSI SIR adjusting for all procedures reported. Alternatively, you can obtain one SSI SIR for all colon surgeries (COLO) only within your facility.

SSI rates per 100 operative procedures are calculated by dividing the number of SSIs by the number of specific operative procedures and multiplying the results by 100. SSI will be included in the numerator of a rate based on the date of procedure, not the date of event. Rate calculations can be performed separately for the different types of operative procedures and stratified by the basic risk index. SSI rate calculation options are available in the advanced analysis feature of the NHSN application.

- Basic SSI Risk Index. The index used in NHSN assigns surgical patients into categories based on the presence of three major risk factors:

  1. Operation lasting more than the duration cut point hours, where the duration cut point is the approximate 75$^{th}$ percentile of the duration of surgery in minutes for the operative procedure.
  2. Contaminated (Class 3) or Dirty/infected (Class 4) wound class.
  3. ASA classification of 3, 4, or 5.

  The patient's SSI risk category is simply the number of these factors present at the time of the operation.

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[1]Klevens RM, Edwards JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[2] Emori TG, Gaynes RP. An overview of healthcare-associated infections, including the role of the microbiology laboratory. Clin Microbiol Rev 1993;6(4):428-42.

[3] Condon RE, Schulte WJ, Malangoni MA, Anderson-Teschendorf MJ. Effectiveness of a surgical wound surveillance program. Arch Surg 1983;118:303-7.

[4] Society for Healthcare Epidemiology of America, Association for Professionals in Infection Control and Epidemiology, Centers for Disease Control and Prevention, Surgical Infection Society. Consensus paper on the surveillance of surgical wound infections. Infect Control Hosp Epidemiol 1992;13(10):599-605.

[5]Haley RW, Culver DH, White JW, Morgan WM, Emori TG, Munn VP. The efficacy of infection surveillance and control programs in preventing healthcare-associated infections in US hospitals. Am J Epidemiol 1985;121:182-205.

[6]Centers for Disease Control and Prevention. Guideline for prevention of surgical site infection,1999. Infect Control Hosp Epidemiol, 1999;20(4):247-278.

[7] Facilities Guidelines Institute. Guidelines for design and construction of health care facilities. American Society for Healthcare Engineering; Chicago IL; 2010.

# CAUTI

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| healthcare-associated infection | urinary tract infection that is catheter-associated | SSI | | AHRQ<br><br>NHSN |

| implementation guidance |
|---|
| NHSN guidance included on the next few pages. |

| examples |
|---|
| |

# Catheter-Associated Urinary Tract Infection (CAUTI) Event

**Introduction:** The urinary tract is the most common site of healthcare-associated infection, accounting for more than 30% of infections reported by acute care hospitals[1]. Virtually all healthcare- associated urinary tract infections (UTIs) are caused by instrumentation of the urinary tract.

CAUTI can lead to such complications as cystitis, pyelonephritis, gram-negative bacteremia, prostatitis, epididymitis, and orchitis in males and, less commonly, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis in all patients. Complications associated with CAUTI cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality. Each year, more than 13,000 deaths are associated with UTIs.[1]

Prevention of CAUTIs is discussed in the CDC/HICPAC document, *Guideline for Prevention of Catheter-associated Urinary Tract Infections*[2].

**Settings:** Surveillance will occur in any inpatient locations where denominator data can be collected, which may include critical intensive care units (ICU), specialty care areas (SCA), stepdown units, and long term care wards. Neonatal units are NOT included. A complete listing of inpatient locations can be found in Chapter 15.

NOTE: It is not required to monitor for CAUTIs after the patient is discharged from the facility, however, if discovered, they should be reported to NHSN. No additional indwelling catheter days are reported.

**Requirements:** Surveillance for CAUTI is performed in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

**Definitions:** As for all infections reported to NHSN, infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection area not considered healthcare associated. Therefore, infections that become apparent within the first few days of admission must be carefully reviewed to determine whether they should be considered healthcare associated.

Urinary tract infections (UTI) are defined using symptomatic urinary tract infection (SUTI) criteria or Asymptomatic Bacteremic UTI (ABUTI) criteria (Table 1 and Figure 1). Report UTIs that are catheter-associated (i.e. patient had an indwelling urinary catheter at the time of or within 48 hours before onset of the event).

NOTES:

1. There is no minimum period of time that the catheter must be in place in order for the UTI to be considered catheter-associated. EXAMPLE: Patient has a Foley catheter in place on an inpatient unit. It is discontinued, and 4 days later patient meets the criteria for a UTI. This is not reported as a CAUTI because the time since Foley discontinuation exceeds 48 hours.
2. SUTI 1b and 2b and other UTI (OUTI) cannot be catheter-associated.

Location of attribution: The location where the patient was assigned on the date of the UTI event, which is further defined as the date when the first clinical evidence appeared or the date the specimen use to meet the criterion was collected, whichever came first. EXAMPLE: Patient who had no clinical signs or symptoms of UTI upon arrival to the Emergency Department, has a Foley catheter inserted there before being admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for UTI. This is reported to the NHSN as a CAUTI for the MICU, because the Emergency Department is not an inpatient location and no denominator data are collected there.

TRANSFER RULE EXCEPTION: If a CAUTI develops within 48 hours of transfer from one inpatient location to another in the same facility, or a new facility, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below.

- Patient with a Foley catheter in place in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the SICU.
- Patient is transferred to the medical ward from the MSICU after having the Foley catheter removed. Within 24 hours, patient meets criteria for a UTI. This is reported to NHSN as a CAUTI for the MSICU.
- Patient with a Foley catheter in place is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the CCU.
- EXAMPLE: Patient on the urology ward of Hospital A had the Foley catheter removed and is discharged home a few hours later. The ICP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a UTI. This CAUTI should be reported to NHSN for Hospital A and attributed to the urology ward.

Indwelling catheter: a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system; also called a Foley catheter; does not include straight in-and-out catheters.

**Numerator Data:** The *Urinary Tract Infection (UTI*) F*orm* (CDC 57.114) is used to collect and report each CAUTI that is identified during the month selected for surveillance. The *Instructions for Completion of Urinary Tract Infection Form* (Tables of Instructions, Tables 5 and 2a) includes brief instructions for collection and entry of

each data element on the form. The UTI form includes patient demographic information and information on whether or not an indwelling urinary catheter was present. Additional data include the specific criteria met for identifying the UTI, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

**Denominator data:** Device days and patient days are used for denominators (See Chapter 16 Key Terms). Indwelling urinary catheter days, which are the number of patients with an indwelling urinary catheter device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.117, and 57.118). When denominator data are available from electronic databases, these sources may be used as long as the counts are not substantially different (+/- 5%) from manually collected counts. These daily counts are summed and only the total for the month is entered into NHSN. Indwelling urinary catheter days and patient days are collected separately for each of the locations monitored.

**Data Analyses:** The SIR is calculated by dividing the number of observed infections by the number of expected infections. The number of expected infections, in the context of statistical prediction, is calculated using CAUTI rates from a standard population during a baseline time period as reported in the NHSN Report.

**NOTE: The SIR will be calculated only if the number of expected HAIs (numExp) is ≥ 1.**

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

While the CAUTI SIR can be calculated for single locations, the measure also allows you to summarize your data by multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you will be able to obtain one CAUTI SIR adjusting for all locations reported. Similarly, you can obtain one CAUTI SIR for all specialty care areas in your facility.

The CAUTI rate per 1000 urinary catheter days is calculated by dividing the number of CAUTIs by the number of catheter days and multiplying the result by 1000. The Urinary Catheter Utilization Ratio is calculated by dividing the number of urinary catheter days by the number of patient days. These calculations will be performed separately for the different types of ICUs, specialty care areas, and other locations in the institution, except for neonatal locations.

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[1]Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[2]Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA. Guideline for prevention of catheter-associated urinary tract infections 2009. Infect Control Hosp Epidemiol. 2010;31(4):319-26.

**Table 1: Urinary Tract Infection Criteria**

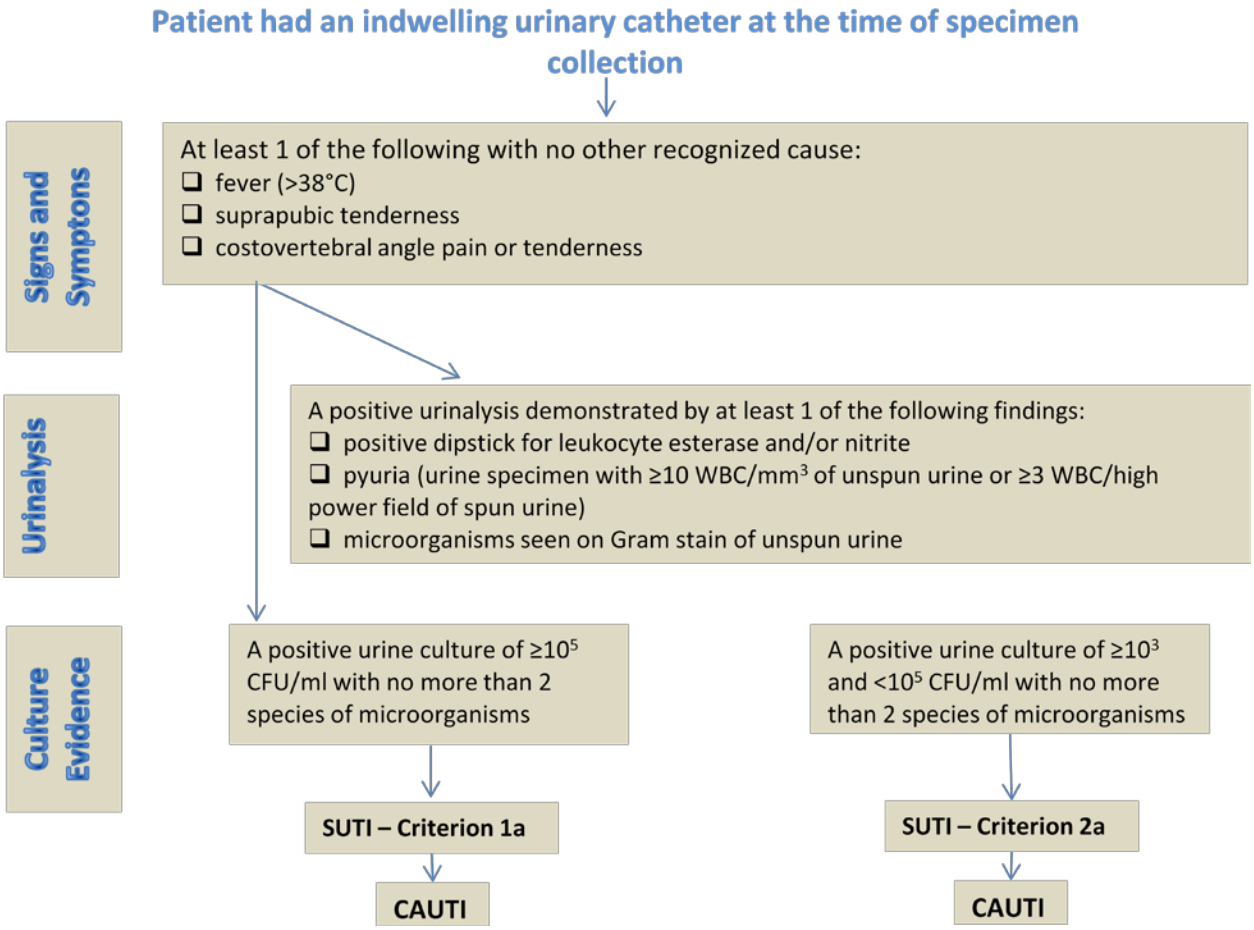
| Criterion | Urinary Tract Infection (UTI) |
|---|---|
| | **Symptomatic Urinary Tract Infection (SUTI)**<br>Must meet at least 1 of the following criteria |
| 1a | Patient had an indwelling urinary catheter in place at the time of specimen collection<br>*and*<br>at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness<br>*and*<br>a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms.<br><br>----------OR----------<br><br>Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection<br>*and*<br>at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness<br>*and*<br>a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. |
| 1b | Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection<br>*and*<br>has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness<br>*and*<br>a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms. |
| 2a | Patient had an indwelling urinary catheter in place at the time of specimen collection<br>*and*<br>at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness<br>*and*<br>a positive urinalysis demonstrated by at least 1 of the following findings:<br>a. positive dipstick for leukocyte esterase and/or nitrite<br>b. pyuria (urine specimen with ≥10 white blood cells [WBC]/$mm^3$ of unspun urine or ≥3 WBC/high power field of spun urine) |

| Criterion | Urinary Tract Infection (UTI) |
|---|---|
| | c. microorganisms seen on Gram stain of unspun urine<br>*and*<br>a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.<br><br>----------OR----------<br><br>Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection<br>*and*<br>at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness<br>*and*<br>a positive urinalysis demonstrated by at least 1 of the following findings:<br>a. positive dipstick for leukocyte esterase and/or nitrite<br><br>b. pyuria (urine specimen with $\geq 10$ white blood cells [WBC]/$mm^3$ of unspun urine or $\geq 3$ WBC/high power field of spun urine)<br>c. microorganisms seen on Gram stain of unspun urine<br>*and*<br>a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms. |
| 2b | Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection<br>*and*<br>has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness<br>*and*<br>a positive urinalysis demonstrated by at least 1 of the following findings:<br>a. positive dipstick for leukocyte esterase and/or nitrite<br><br>b. pyuria (urine specimen with $\geq 10$ WBC/$mm^3$ of unspun urine or $\geq 3$ WBC/high power field of spun urine)<br>c. microorganisms seen on Gram stain of unspun urine<br>*and*<br>a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms. |
| 3 | Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or |

| Criterion | Urinary Tract Infection (UTI) |
|---|---|
| | vomiting<br>*and*<br>a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms. |
| 4 | Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting<br>*and*<br>a positive urinalysis demonstrated by at least one of the following findings:<br>a. positive dipstick for leukocyte esterase and/or nitrite<br>b. pyuria (urine specimen with ≥10 WBC/$mm^3$ of unspun urine or ≥3 WBC/high power field of spun urine)<br>c. microorganisms seen on Gram's stain of unspun urine<br>*and*<br>a positive urine culture of between $\geq 10^3$ and $<10^5$ CFU/ml with no more than two species of microorganisms. |
| **Criterion** | **Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)** |
| | Patient with or without an indwelling urinary catheter has no signs or symptoms (i.e., for any age patient, no fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness, OR for a patient ≤1 year of age, no fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting)<br>*and*<br>a positive urine culture of $>10^5$ CFU/ml with no more than 2 species of uropathogen microorganisms*<br>*and*<br>a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture, or at least 2 matching blood cultures drawn on separate occasions if the matching pathogen is a common skin contaminant.<br><br>* Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*,and *Corynebacterium* (urease positive). |
| **Comments** | • Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection.<br>• Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization. Specimens from indwelling catheters should be aspirated through the disinfected sampling ports.<br>• In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by |

| Criterion | Urinary Tract Infection (UTI) |
|---|---|
| | catheterization or suprapubic aspiration.<br>• Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate urine preservative. Refrigerated specimens should be cultured within 24 hours.<br>• Urine specimen labels should indicate whether or not the patient is symptomatic.<br>• Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI).<br>• Report only pathogens in both blood and urine specimens for ABUTI.<br>• Report *Corynebacterium* (urease positive) as either *Corynebacterium* species unspecified (COS) or, as *C. urealyticum* (CORUR) if so speciated. |
| **Criterion** | **Other Urinary Tract Infection (OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperineal or perinephric space)** |
| | Other infections of the urinary tract must meet at least 1 of the following criteria: |
| 1 | Patient has microorganisms isolated from culture of fluid (other than urine) or tissue from affected site. |
| 2 | Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination. |
| 3 | Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site<br>*and*<br>at least 1 of the following:<br>a. purulent drainage from affected site<br>b. microorganisms cultured from blood that are compatible with suspected site of infection<br>c. radiographic evidence of infection (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]). |
| 4 | Patient ≤ 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, lethargy, or vomiting<br>*and*<br>at least 1 of the following:<br>a. purulent drainage from affected site<br>b. microorganisms cultured from blood that are compatible with suspected site of infection<br>c. radiographic evidence of infection, (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]). |
| **Comment** | • Report infections following circumcision in newborns as SST-CIRC. |

**Figure 1: Identification and Categorization of SUTI Indwelling Catheter at the Time of Specimen Collection**



| Criterion | Urinary Tract Infection (UTI) |
|---|---|
| | catheterization or suprapubic aspiration.<br>• Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate urine preservative. Refrigerated specimens should be cultured within 24 hours.<br>• Urine specimen labels should indicate whether or not the patient is symptomatic.<br>• Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI).<br>• Report only pathogens in both blood and urine specimens for ABUTI.<br>• Report *Corynebacterium* (urease positive) as either *Corynebacterium* species unspecified (COS) or, as *C. urealyticum* (CORUR) if so speciated. |
| **Criterion** | **Other Urinary Tract Infection (OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperineal or perinephric space)** |
| | Other infections of the urinary tract must meet at least 1 of the following criteria: |
| 1 | Patient has microorganisms isolated from culture of fluid (other than urine) or tissue from affected site. |
| 2 | Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination. |
| 3 | Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site<br>*and*<br>at least 1 of the following:<br>a. purulent drainage from affected site<br>b. microorganisms cultured from blood that are compatible with suspected site of infection<br>c. radiographic evidence of infection (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]). |
| 4 | Patient ≤ 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, lethargy, or vomiting<br>*and*<br>at least 1 of the following:<br>a. purulent drainage from affected site<br>b. microorganisms cultured from blood that are compatible with suspected site of infection<br>c. radiographic evidence of infection, (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]). |
| **Comment** | • Report infections following circumcision in newborns as SST-CIRC. |

**Figure 1: Identification and Categorization of SUTI Indwelling Catheter at the Time of Specimen Collection**

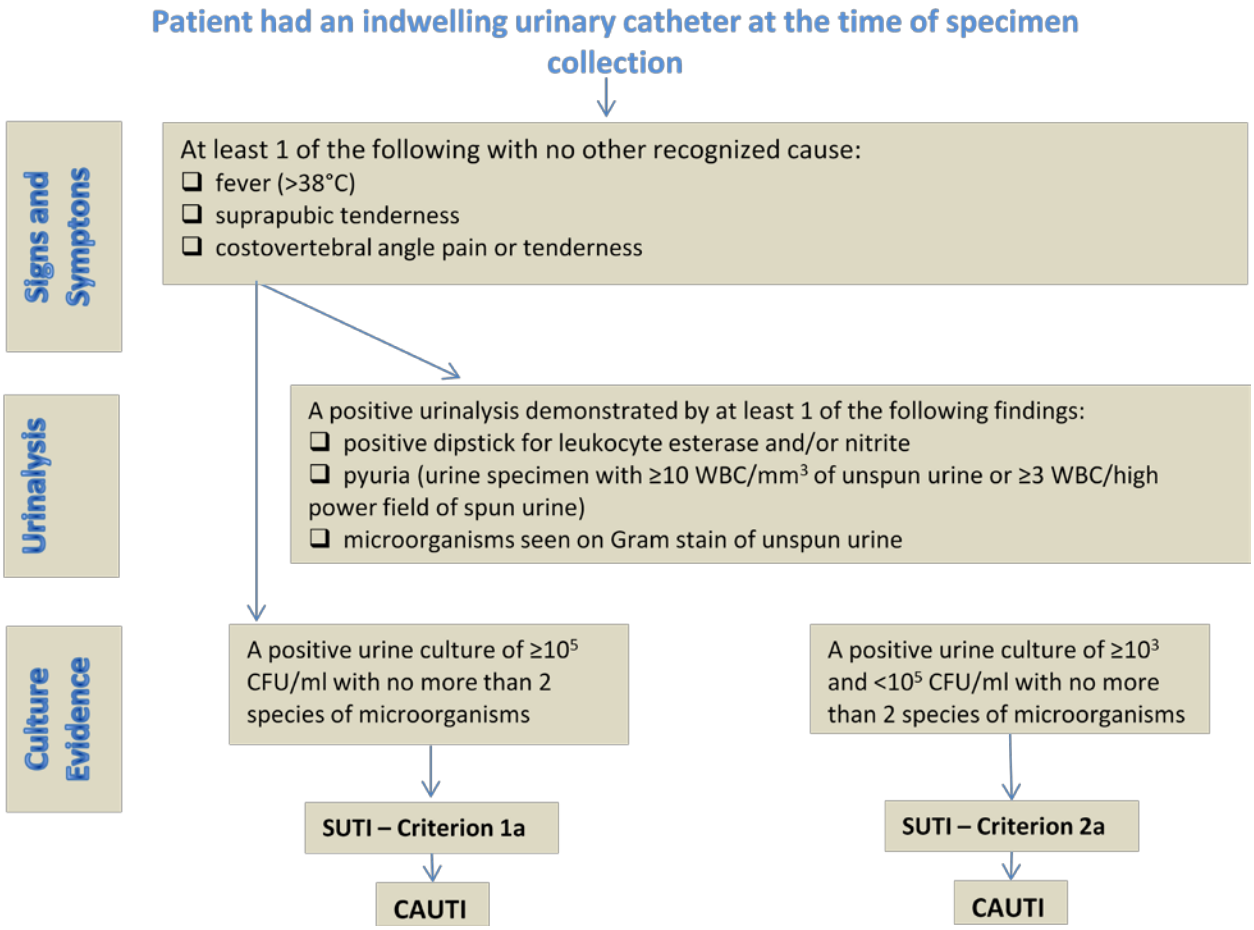


**Figure 2: Identification and Categorization of SUTI Indwelling Catheter Discontinued in Prior 48 Hours**

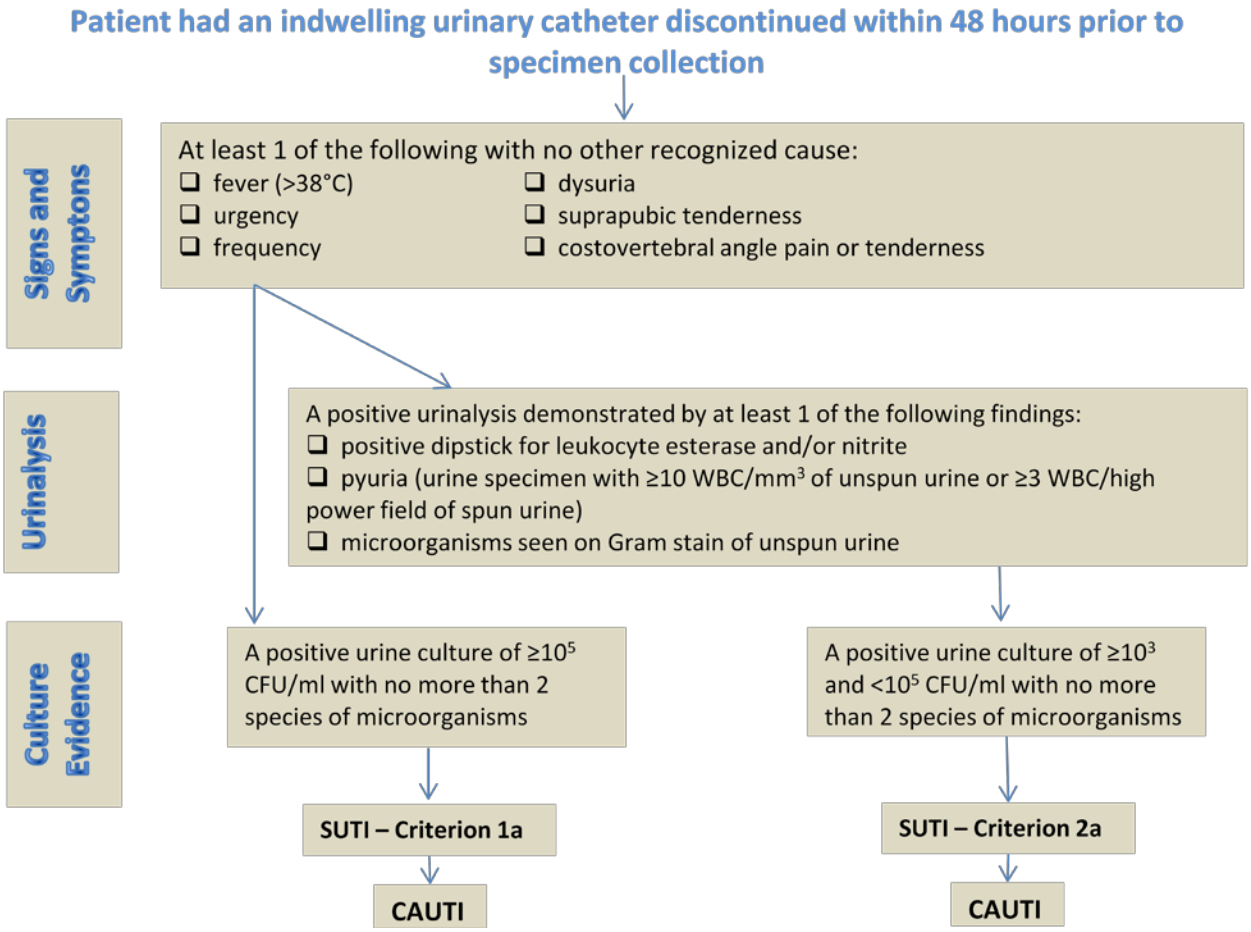


**Figure 3: Identification and Categorization of SUTI Without Indwelling Catheter at Time of or Within 48 Hours Prior to Specimen Collection**

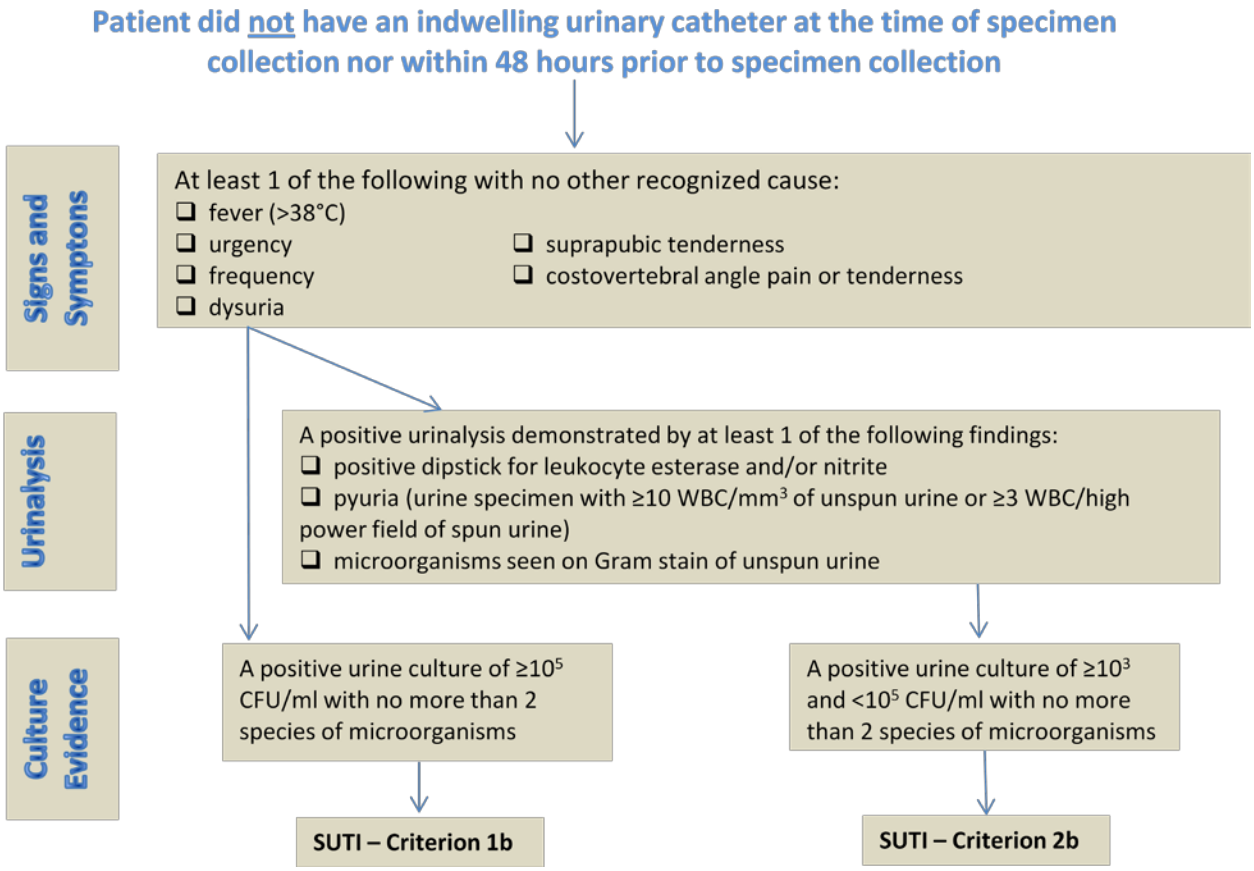


**Figure 4: Identification and Categorization of SUTI in Patient ≤1 Year of Age**

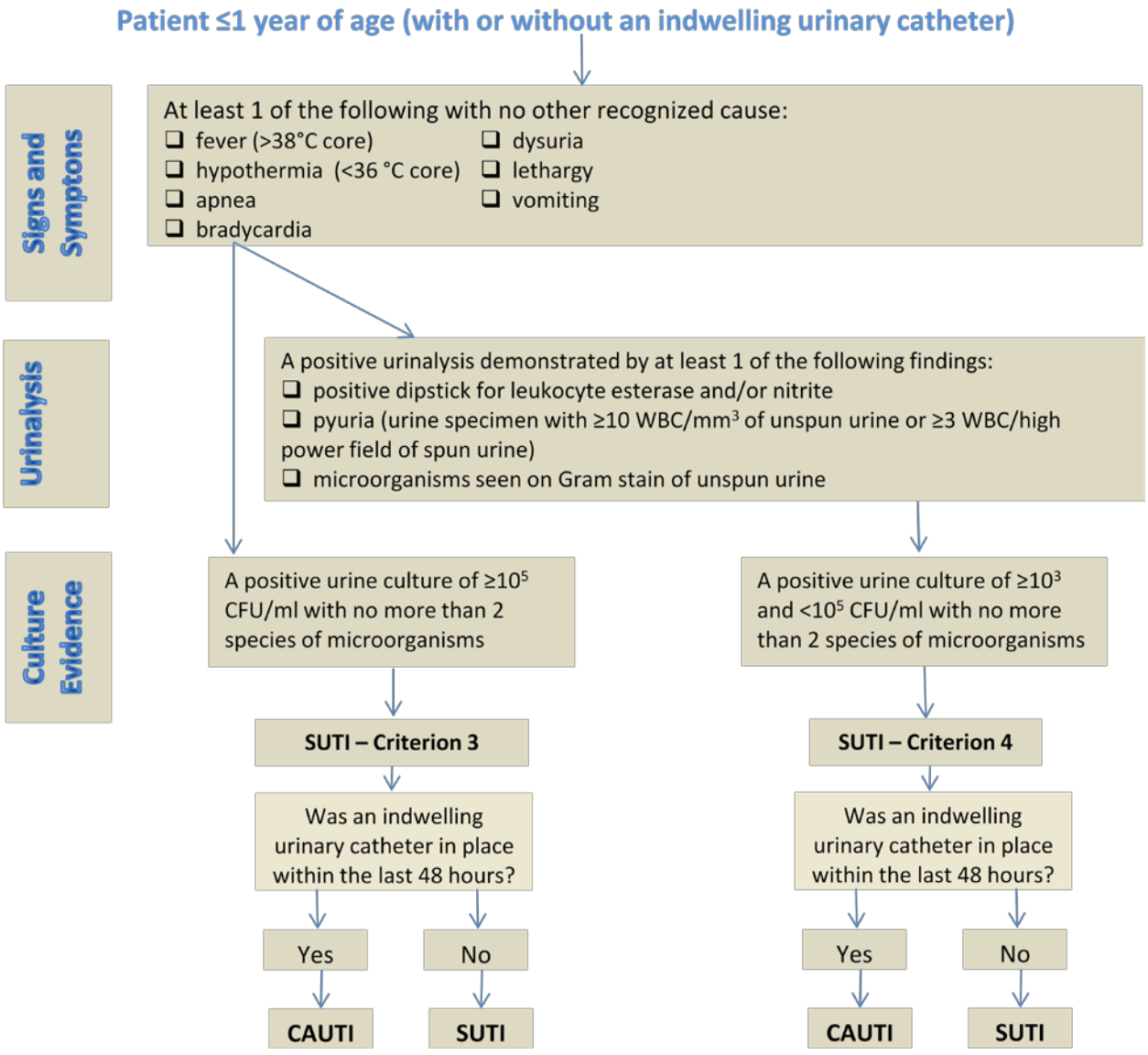
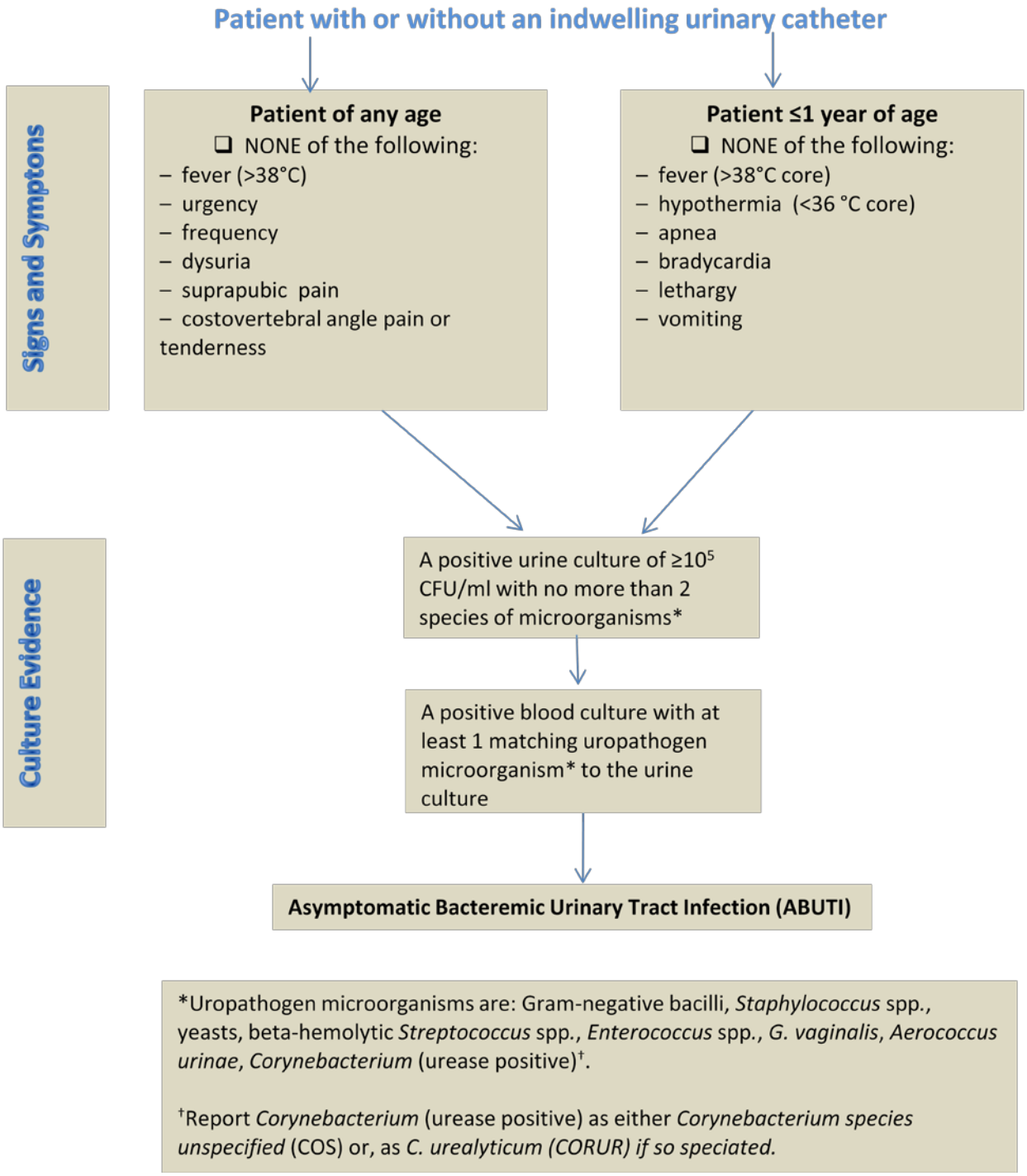


**Figure 5: Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)**



# HAI – other

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| other | healthcare-associated infection | HAI | | NRS |

| implementation guidance |
|---|
| This area is intended to capture events not previously covered in above categories. Reviewing 2009-2010 data categorical inclusion: *E Coli* in sputum on ventilator, stool infection, necrotizing pancreatitis. |

| examples |
|---|
| *actual sentinel event*: A 68 year-old male is admitted with stool impaction and a urinary tract infection. After 4 days in hospital, the patient's condition worsens, and he is subsequently found to have *C difficile* in his stool. The infection results in sepsis and 3-day prolonged hospitalization with admission to intensive care unit. |

# other – specify

| event category | full term | short term | specifications | standard |
|---|---|---|---|---|
| other | other | other | | NRS |

| implementation guidance |
|---|
| Any unexpected death not elsewhere classified qualifies as a sentinel event and should be reported under the other category with a brief description accompanying it. |

| examples |
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| *actual sentinel event*: A patient undergoes a surgical procedure and pre-operative assessment reveals no allergies. The patient receives intravenous Cephalexin and has a subsequent anaphylactic reaction. All attempts are made to revive patient, but they are unsuccessful, and the patient dies.<br><br>*actual sentinel event*: A 62 year-old patient with underlying HTN, diabetes, and obesity is medically cleared for a hip replacement. The patient is anesthetized without complication. An intra-operative cardiac arrhythmia is noted, and the patient is defibrillated without success and is subsequently pronounced dead.<br><br>*not a sentinel event*: 72 year-old Hispanic male diagnosed with end-stage pancreatic cancer agrees to a palliative surgery to improve comfort. The day after surgery, the patient has a cardiac arrhythmia and dies. Death is attributed to the patient's terminal cancer. This does not need to be reported. |