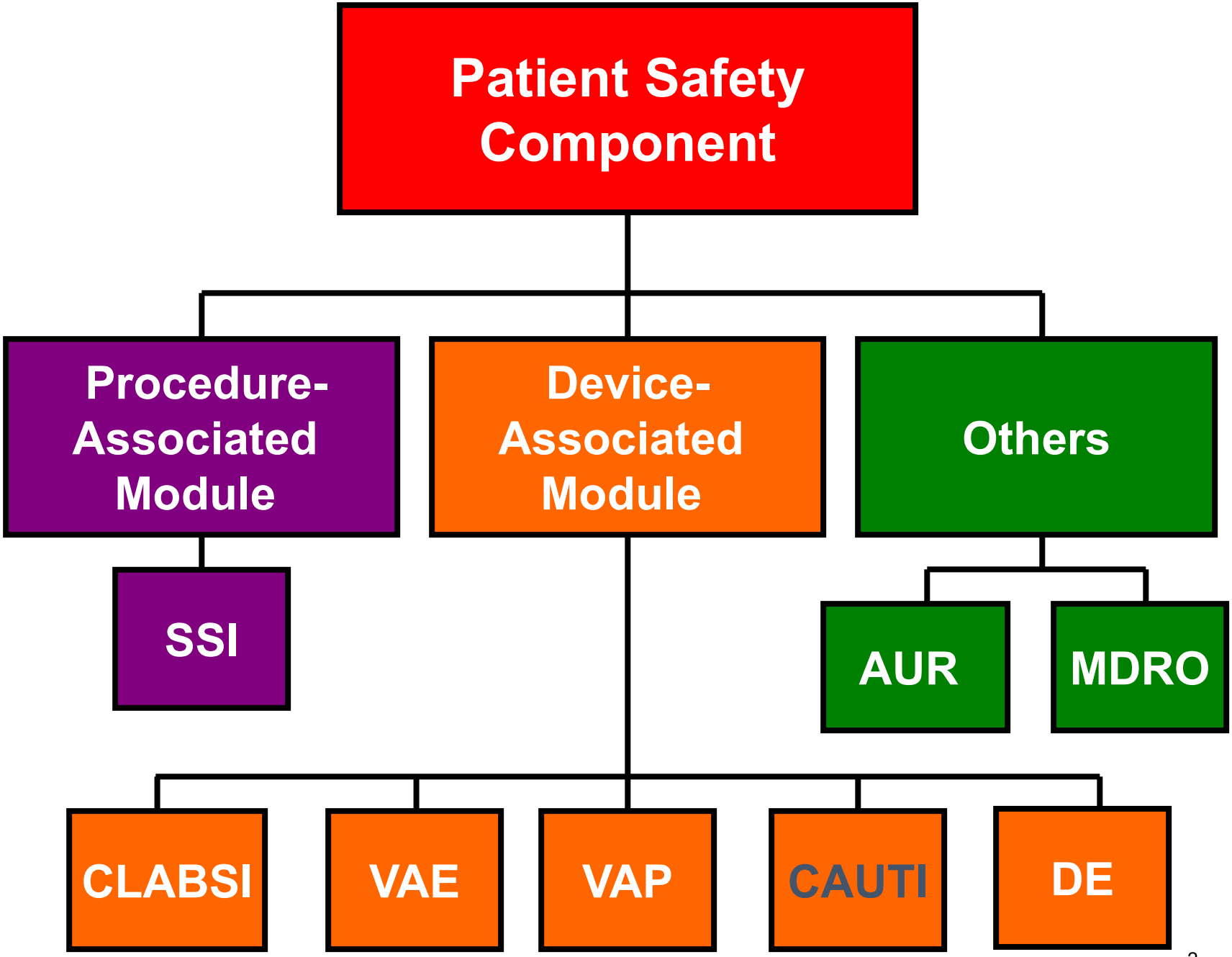
وزارة الصحة
Ministry of Health

CAUTI Surveillance

General Directorate Of Infection Prevention And Control

Ministry Of Health, KSA


Patient Safety Component
Procedure-Associated Module
Device-Associated Module
Others
SSI
AUR
MDRO
CLABSI
VAE
VAP
CAUTI
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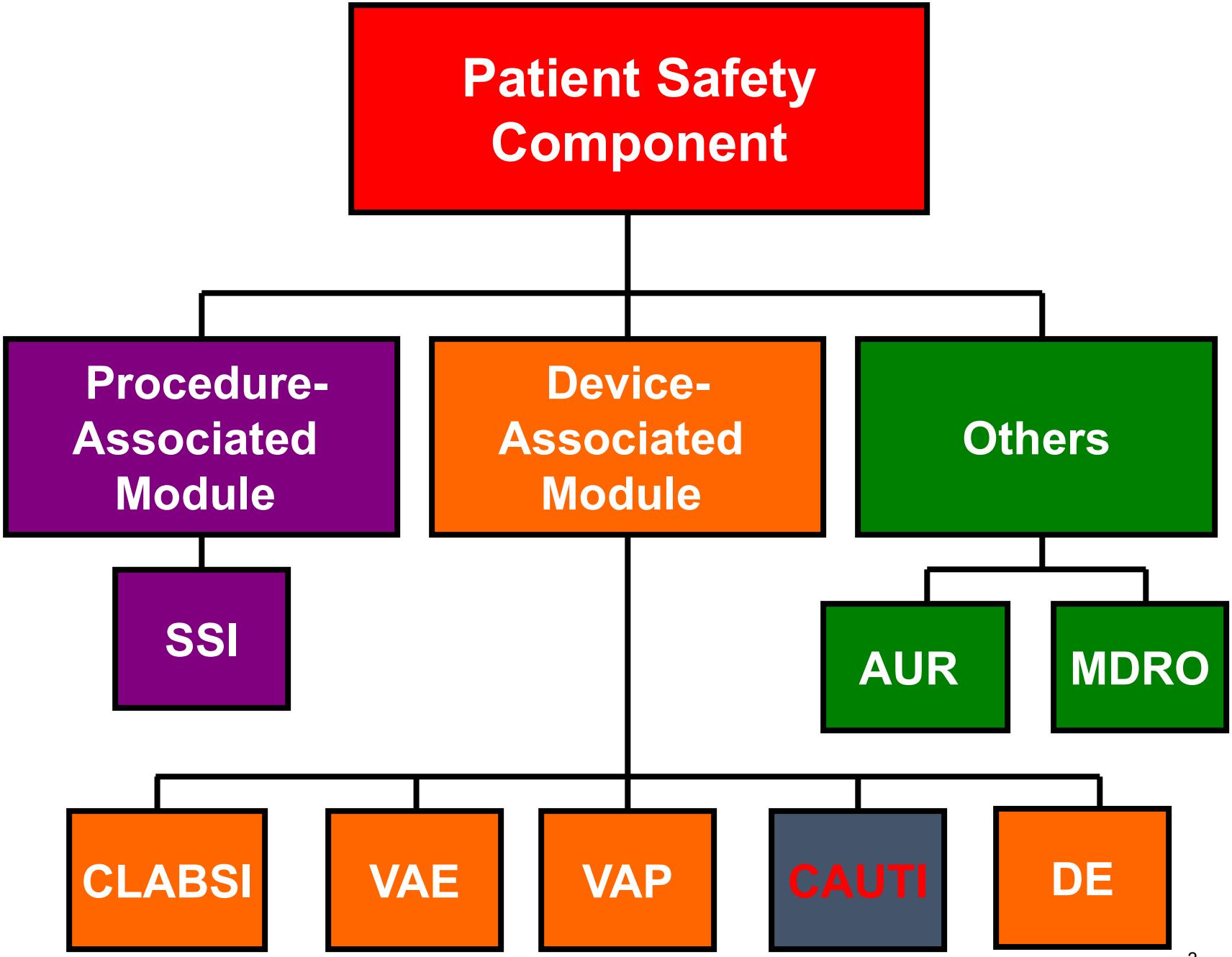
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Impact of CAUTI

- CAUTI is the one of the most common site of HAI in acute care hospitals
- The attributable mortality for CAUTI is approximately 2.3%
- Leading cause of secondary BSI with ~10% mortality
- In developing countries: crude mortality of CAUTI is 17% with attributable mortality 7%
- Prolongs ICU stay by an average 5-6 days
- Excess cost of $3,000 per patient
- One-third of antimicrobial use inappropriately aimed at treatment of asymptomatic bacteriuria

CAUTI Surveillance

Catheter-associated UTI (CAUTI)

- CAUTI is defined as symptomatic urinary tract infection (SUTI) or asymptomatic bacteremic UTI (ABUTI) in a patient who had an indwelling urinary catheter

Catheter-associated UTI

- Indwelling urinary catheter has to be in place for >2 days and in place at the date of event or the day before.

Indwelling urinary catheter

- Indwelling catheter: A drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a drainage bag (including leg bags).
- These devices are also called Foley catheters.
- Condom or straight in-and-out catheters are not included nor are nephrostomy tubes, ileoconduits, or suprapubic catheters unless a Foley's catheter is also present.
- Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.

Surveillance Methodology

- Active
- Patient based
- Prospective
- Priority-directed targeted
- Yield risk-adjusted incidence rates

CAUTI surveillance

- **Surveillance location:** any inpatient locations where denominator data can be collected
    - ICUs
    - SCA
    - Other inpatient locations

  NICUs are excluded from the CAUTI Surveillance
- **Date of event(DOE):** Date of first element used to meet the UTI infection criterion occurred for the first time within the 7-day Infection Window Period

Location of attribution

- The inpatient location where the patient was assigned on the date of the CAUTI event, which is further defined as the date when the first element used to meet the CAUTI criterion occurred.

- OR/Post Anesthesia Care Unit/Recovery Room/dialysis unit /ERs cannot be considered a location of attribution for CAUTI.

- **Example**: Patient in the SICU with a Foley's catheter, which has been in place for 5 days, is transferred to a surgical ward. The next day is determined to be the date of event for a CAUTI. This is reported as a CAUTI for the SICU.

Multiple Transfers

- If the patient has been transferred to more than one location on the date of CAUTI, or the day before, attribute the CAUTI to the first location in which the patient was housed the day before the CAUTI's date of event

CAUTI
Multiple Transfer

Patient MRN	May 24	May 25 (transfer)	May 26 (transfer)	Location attribution
5000007	Unit A	Unit A >> Unit B >> Unit C	Unit C >> Unit D CAUTI diagnosed	

CAUTI
Multiple Transfer

Patient MRN	May 24	May 25 (transfer)	May 26 (transfer)	Location attribution
5000007	Unit A	Unit A >> Unit B >> Unit C	Unit C >> Unit D CAUTI diagnosed	

Patient is in 2 locations on the day of event

CAUTI
Multiple Transfer

Patient MRN	May 24	May 25 (transfer)	May 26 (transfer)	Location attribution
5000007	Unit A	Unit A >> Unit B >> Unit C	Unit C >> Unit D CAUTI diagnosed	

Attribute the infection to the first location in which the patient was housed the day before the infection's date of event.

CAUTI
Multiple Transfer

Patient MRN	May 24	May 25 (transfer)	May 26 (transfer)	Location attribution
5000007	Unit A	Unit A >> Unit B >> Unit C	Unit C >> Unit D CAUTI diagnosed	**Unit A**

Attribute the infection to the first location in which the patient was housed the day before the infection's date of event.

CAUTI Updates

General HAI changes

- 7-day Infection Window Period
  - Date of Event
  - POA (Present on admission)
  - HAI including transfer and multiple transfer rules
  - 14-day Repeat Infection Timeframe (RIT)
  - Urinary catheter removal and reinsertion
  - Secondary BSI Attribution Period
  - Pathogen Assignment Guidance
  - Use of non-culture based microbiologic testing method only for blood in ABUTI (not urine)

Catheters that are removed and reinserted

- If indwelling urinary catheter was removed and reinserted before a full calendar day, then continue the day count.

- Therefore, if the patient is without a urinary catheter for at least one full calendar day (NOT to be read as 24 hours), then start a new day count.

Urinary catheter is removed & reinserted

	March 31 (Hospital day 3)	April 1	April 2	April 3	April 4	April 5	April 6
Patient A	Foley **Day 3**	Foley **Day 4**	Foley removed **(Foley Day 5)**	Foley replaced **(Foley Day 6)**	Foley **Day 7**	Foley removed **Day 8**	No Foley

Continue the UC day count; No one-day gap

Urinary catheter is removed & reinserted

	March 31 (Hospital day 3)	April 1	April 2	April 3	April 4	April 5	April 6
Patient A	Foley **Day 3**	Foley **Day 4**	Foley removed **(Foley Day 5)**	Foley replaced **(Foley Day 6)**	Foley **Day 7**	Foley removed **Day 8**	No Foley

Start a new UC day count; one-day gap

Repeat Infection time frame (RIT)

- It is 14-day timeframe during which no new CAUTI of the same type are reported.

- The date of event is Day 1 of the 14-day RIT.

Organisms not acceptable for CAUTI

- Commensal urine flora:
  - Mixed flora
- Organisms cannot be used to meet the UTI definition:
  - Candida species or yeast not otherwise specified
  - Mold
  - Dimorphic fungi or
  - Parasites
- Specific community-associated fungal pathogens:
  - Blastomyces
  - Coccidioides
  - Cryptococcus
  - Histoplasma
  - Paracoccidioides
  - Pneumocystis

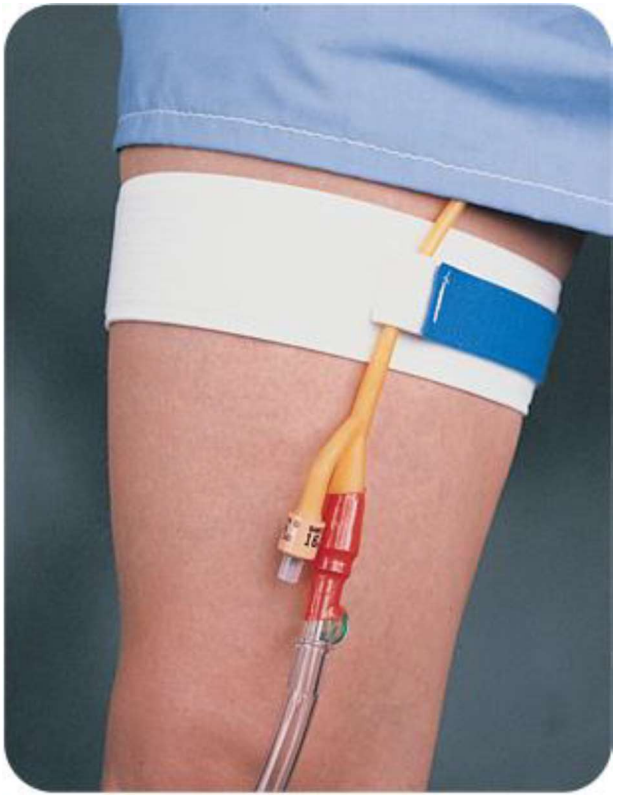
CAUTI Criteria

Symptomatic UTI (SUTI-1)

- **Patient must meet 1, 2, and 3 below:**

1. Patient had an indwelling urinary catheter that had been in place for > 2 days on the date of event AND was either:
   - ❑ Present for any portion of the calendar day on the date of event OR
   - ❑ Removed the day before the date of event
2. Patient has at least one of the following signs or symptoms:
   - ❑ Fever (>38.0°c)
   - ❑ Suprapubic pain or tenderness
   - ❑ Costovertebral angle pain or tenderness
   - ❑ Urinary urgency*
   - ❑ Urinary frequency*
   - ❑ Dysuria*
3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium $\geq 10^5$ CFU/ml.

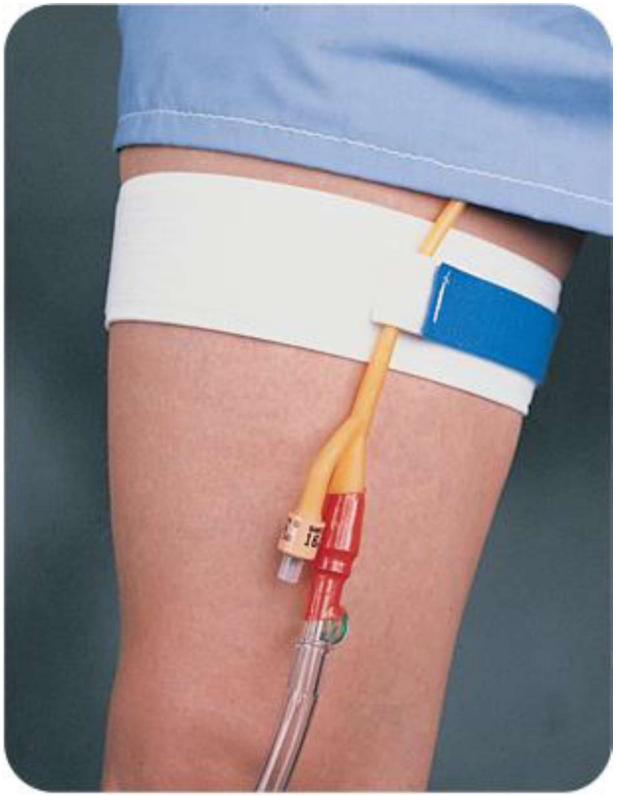
Symptomatic UTI (SUTI-1)



- Fever (>38.0°c)
- Suprapubic pain or tenderness
- Costovertebral angle pain or tenderness

Indwelling urinary catheter present for any portion of the calendar day on the date of event

Symptomatic UTI (SUTI-1)



- ❑ Fever (>38.0°c)
- ❑ Suprapubic pain or tenderness
- ❑ Costovertebral angle pain or tenderness
- ❑ Urinary urgency
- ❑ Urinary frequency
- ❑ Dysuria

Indwelling urinary catheter removed the day before the date of event

Symptomatic UTI (SUTI-2)

Patient must meet 1, 2, and 3 below:

1. Patient is ≤1 year and had an indwelling urinary catheter that had been in place for > 2 days on the date of event AND was either:
   - ❑ Present for any portion of the calendar day on the date of event OR
   - ❑ Removed the day before the date of event
2. Patient has at least one of the following signs or symptoms:
   - ❑ fever (>38.0°C)
   - ❑ hypothermia (<36.0°C)
   - ❑ apnea
   - ❑ bradycardia
   - ❑ lethargy
   - ❑ vomiting
   - ❑ suprapubic tenderness*
3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium $\geq 10^5$ CFU/ml.

Asymptomatic Bacteremic UTI (ABUTI)

Patient must meet 1, 2, and 3 below:

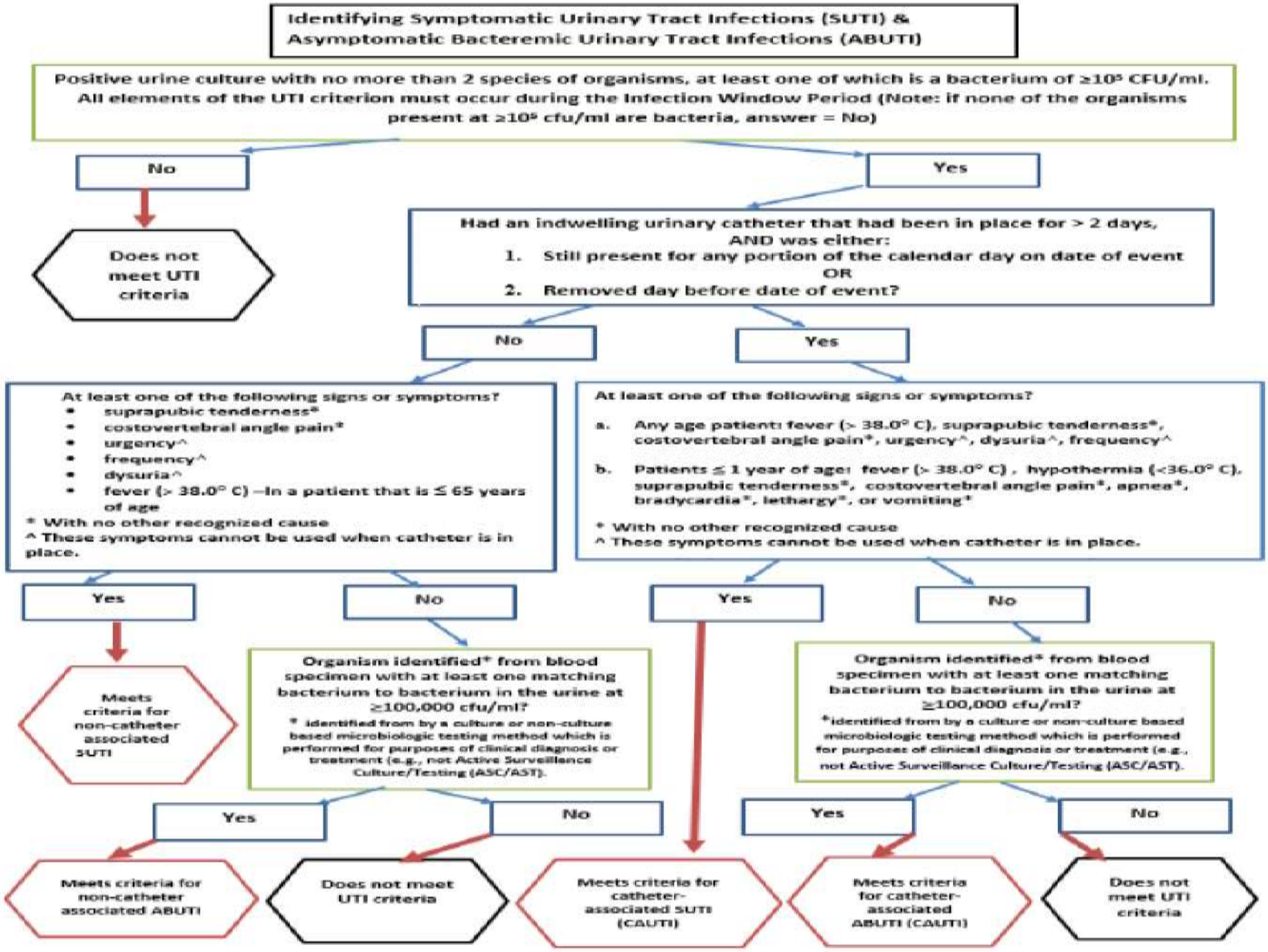
1. Patient with* or without an indwelling urinary catheter has no signs or symptoms of SUTI 1 or 2 according to age (Note: Patients > 65 years of age may have a fever and still meet the ABUTI criterion BUT the indwelling urinary catheter needs to be in place > 2 calendar days on the date of event)

1. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium $\geq 10^5$ CFU/m

1. Patient has organism identified from blood specimen with at least one matching bacterium to the bacterium identified in the urine specimen, or meets LCBI criterion 2 (without fever) and matching common commensal(s) in the urine.

All elements of the ABUTI criterion must occur during the Infection Window Period

Figure 3: Identifying SUTI and ABUTI Flowchart



Notes on CAUTI criteria

- In SUTI criteria, pain or tenderness of suprapubic region or costovertebral angle should be without other recognized cause

- Fever is a non-specific symptom of infection and cannot be excluded from UTI determination because it is thought clinically it is due to another recognized cause.

- Suprapubic tenderness whether elicited by palpation (tenderness-sign) or provided as a subjective complaint of suprapubic pain (pain-symptom), documentation of either found in the medical record is acceptable as a part of SUTI criterion

Secondary BSI caused by CAUTI

- Positive urine specimen
  - Organisms identified by a culture method only
  - During infection window period
- Matching positive blood specimen
  - Organisms identified by a culture or non-culture based microbiologic testing method
  - During BSI attribution period

Mixed flora

- The majority of urine culture recover one pathogen. More than two species in the same culture means mixed flora
- Acceptable positive urine culture for STUI should have no more than 2 species of microorganisms.
- More than two species in the same culture cannot be used to meet the SUTI criteria.
- Examples
- Culture with Pseudomonas aeruginosa and Providencia stuartii= 2 species
- Culture with E. Coli, enterococcus, & proteus= 3 species
- MSSA and MRSA = 1 species (report most resistant)

Specimen Collection

- 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.
- 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 catheterization or suprapubic aspiration.
- Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection.

Specimen Processing

- 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

Collection of denominator data for CAUTI

- Manual, daily: patient days and urinary catheter days should be collected at the same time, every day, for each location performing surveillance to ensure that different collection methods don't result in device days being > patient days.

CAUTI analysis

$$\text{CAUTI SIR} = \frac{\text{Observed CAUTI events}}{\text{Expected CAUTI events}}$$

SIR: Standardized Infection Ratio

Observed # of CAUTI:

The number of detected CAUTI

Expected or predicted # of CAUTI:

urinary catheter days *(NHSN CAUTI rate/1000)

Note: The SIR can be calculated only if the number of expected CAUTI is ≥ 1

CAUTI analysis

$$\text{CAUTI rate} = \frac{\text{CAUTI events}}{\text{Urinary catheter days}} \times 1000$$

$$\text{Urinary Catheter Utilization Ratio} = \frac{\text{Urinary catheter days}}{\text{Patient-days}}$$

Rate & ratio stratification:

- By location: e.g. ICU or ward type

THANKS