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Kuwait National Healthcare-associated
Infections Surveillance System

Urinary Tract Infection (Catheter-Associated Urinary Tract Infection [CAUTI] and Non-Catheter-Associated Urinary Tract Infection [UTI]) and Other Urinary System Infection [USI] Events

Settings:

Surveillance will occur in all inpatient locations in Kuwait Ministry of Health hospitals.

NOTE:

Surveillance for UTIs after the patient is discharged from the facility is not required. However, if discovered, any UTIs with a date of event on the day of discharge or the next day should be reported to KNHSS (see Transfer Rule). No additional indwelling catheter days are reported.

Definitions:

Present on Admission (POA): Infections that are POA, are not considered Healthcare-associated infections (HAIs) and therefore are never reported to KNHSS.

Healthcare-associated infections (HAI): All NHSN site specific infections must first meet the HAI definition before a site specific infection (e.g., CAUTI) can be reported to KNHSS.

Urinary tract infections (UTI) are defined using Symptomatic Urinary Tract Infection (SUTI) criteria, Asymptomatic Bacteremic UTI (ABUTI), or Urinary System Infection (USI) criteria (See Table 1 and Figure 3).

Date of event (DOE): For a UTI, the date of event is the date when the first element used to meet the UTI infection criterion occurred for the first time within the 7-day Infection Window Period. Synonyms: infection date, event date.

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 catheter is also present. Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.

Catheter-associated UTI (CAUTI): A UTI where an indwelling urinary catheter was in place for >2 calendar days on the date of event, with day of device placement being Day 1,

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AND

an indwelling urinary catheter was in place on the date of event or the day before. If an indwelling urinary catheter was in place for > 2 calendar days and then removed, the date of event for the UTI must be the day of discontinuation or the next day for the UTI to be catheter-associated.

Example of Associating Catheter Use to UTI:

A patient in an inpatient unit has a Foley catheter inserted and the following day is the date of event for a UTI. Because the catheter has not been in place >2 calendar days on the date of event, this is not a CAUTI. However, depending on the date of admission, this may be a healthcare-associated UTI.

Notes:

1. SUTI 1b and USI cannot be catheter-associated.
2. Indwelling urinary catheters that are removed and reinserted: If, after indwelling urinary catheter removal, the patient is without an indwelling urinary catheter for at least 1 full calendar day (**NOT** to be read as 24 hours), then the urinary catheter day count will start anew. If instead, a new indwelling urinary catheter is inserted before a full calendar day has passed without an indwelling urinary catheter being present, the urinary catheter day count will continue.

Figure 1: Associating Catheter Use to UTI

	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
Patient B	Foley Day 3	Foley Day 4	Foley removed (Foley Day 5)	No Foley	Foley replaced (Foley Day 1)	Foley Day 2	Foley Day 3

Rationale: KNHSS surveillance for infection is not aimed at a specific device. Instead surveillance is aimed at identifying risk to the patient that is the result of device use in general.

- In the examples above, Patient A is eligible for a CAUTI beginning on March 31, through April 6th, since a Foley was in place for some portion of each calendar day until April

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6th. A UTI with date of event on April 6th would be a CAUTI since the catheter had been in place greater than 2 days and was removed the day before the date of event.

- Patient B is eligible for a CAUTI on March 31 (Foley Day 3) through April 3. The catheter had been in place > 2 days and an HAI occurring on the day of device discontinuation or the following calendar day is considered a device-associated infection.

Location of attribution: The inpatient location where the patient was assigned on the date of the UTI event. See Date of Event definition (above). See Exception to Location of Attribution (below).

Exception to Location of Attribution

Transfer Rule: If the date of event for a CAUTI is on the date of transfer or discharge, or the next day, the infection is attributed to the transferring/discharging location. This is called the Transfer Rule and examples are shown below. Receiving facilities should share information about such HAIs with the transferring location or facility to enable reporting.

Examples of the Transfer Rule:

- Patient in the SICU with a Foley 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 to KNHSS as a CAUTI for the SICU.
- Patient is transferred in the morning to the medical ward from the MSICU after having the Foley catheter removed, which had been in place for 6 days. Later that night, the patient experiences urinary frequency and the next day, all other UTI criteria are met. This is reported to KNHSS as a CAUTI for the MSICU as the date of event (date when the first element of UTI criteria, first appeared during the infection window) was the day of transfer from that location.
- On Monday, patient with a Foley catheter in place is transferred from the medical ward to the coronary care unit (CCU). Wednesday in the CCU, patient has a fever and urine culture collected that day is positive for 100,000 CFU/ml of *E. coli*. This is reported to KNHSS as a CAUTI for the CCU, as the UTI event date is LATER THAN the day after transfer.
- A patient has a Foley catheter removed on catheter day 5 and is discharged the same day from hospital A's urology ward. The next day, the IP from Hospital B calls to report that this patient has been admitted to Hospital B meeting UTI criteria. This CAUTI should be reported to KNHSS for Hospital A and attributed to the urology ward.

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Multiple Transfers

In instances where a patient has been transferred to more than one location on the date of a UTI, or the day before, attribute the UTI to the **first** location in which the patient was housed the **day before** the UTI's date of event.

Figure 2: Multiple Transfers within the Transfer Rule Time Frame

Date	22/3	23/3	24/3
Locations in which patient was housed	Unit A	Unit A Unit B Unit C	Unit C Unit D This is also the date for a CAUTI. CAUTI is attributed to Unit A since Unit A was the first location in which the patient was housed the day before the date of event

Table 1: Urinary Tract Infection Criteria

Criterion	Urinary Tract Infection (UTI)
Symptomatic UTI (SUTI) Must meet at least <u>one</u> of the following criteria:	
SUTI 1a Catheter-associated Urinary Tract Infection (CAUTI)	Patient must meet <u>1, 2, and 3</u> below: 1. Patient had an indwelling urinary catheter that had been in place for > 2days on the date of event (day of device placement = Day 1) AND was either: <ul style="list-style-type: none">• <i>INPLACE</i>: i.e. present for the entire day or part of the day on the date of event <p style="text-align: center;">OR</p> <ul style="list-style-type: none">• <i>REMOVED</i>: i.e. removed the day before the date of event and 2. Patient has at least <u>one</u> of the following signs or symptoms: <ul style="list-style-type: none">• fever (>38.0°C)• suprapubic tenderness*• costovertebral angle pain or tenderness*• urinary urgency*• urinary frequency*• dysuria*

	<p>and</p> <p>3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacteria of $\geq 10^5$ CFU/ml. All elements of the UTI criterion must occur during the Infection Window Period.</p> <ul style="list-style-type: none"> • *With no other recognized cause (see Notes below) <p>Notes:</p> <ul style="list-style-type: none"> • An indwelling urinary catheter present in place would constitute “other recognized cause” for patient complaints of <u>“frequency” “urgency” or “dysuria” and therefore these cannot be used as symptoms when catheter is present.</u> • Fever and hypothermia are non-specific symptoms of infection and <u>cannot</u> be excluded from UTI determination because they are clinically deemed due to another recognized cause.
<p>SUTI 1b</p> <p>Non-Catheter-associated Urinary Tract Infection (Non-CAUTI)</p>	<p>Patient must meet <u>1, 2, and 3</u> below:</p> <p>1. One of the following is true:</p> <ul style="list-style-type: none"> • Patient has/had an indwelling urinary catheter but it has/had <u>not</u> been in place >2 calendar days on the date of event† <p>OR</p> <ul style="list-style-type: none"> • Patient did <u>not</u> have a urinary catheter in place on the date of event nor the day before the date of event† <p>and</p> <p>2. Patient has at least <u>one</u> of the following signs or symptoms:</p> <ul style="list-style-type: none"> • fever (>38°C) in a patient that is ≤ 65 years of age • suprapubic tenderness* • costovertebral angle pain or tenderness* • urinary frequency* • urinary urgency* • dysuria* <p>and</p> <p>3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacteria of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period.</p> <ul style="list-style-type: none"> • † When entering event into KNHSS UTI form choose “NEITHER” for Risk Factor for Urinary Catheter. • *With no other recognized cause (see Notes below).

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	<p>Notes:</p> <ul style="list-style-type: none">• An indwelling urinary catheter in place would constitute other recognized cause for patient complaints of <u>“frequency” “urgency” or “dysuria” and therefore these cannot be used as symptoms when catheter is present.</u>• Fever and hypothermia are non-specific symptoms of infection and <u>cannot</u> be excluded from UTI determination because they are clinically deemed due to another recognized cause.
<p>SUTI 2</p> <p>CAUTI or Non-CAUTI in patients 1 year of age or less-</p>	<p>Patient must meet <u>1, 2, and 3</u> below:</p> <p>1. Patient is ≤ 1 year of age (with \nexists or without an indwelling urinary catheter)</p> <p>and</p> <p>2. Patient has at least <u>one</u> of the following signs or symptoms:</p> <ul style="list-style-type: none">• fever ($>38.0^{\circ}\text{C}$)• hypothermia ($<36.0^{\circ}\text{C}$)• apnea*• bradycardia*• lethargy*• vomiting*• suprapubic tenderness* <p>and</p> <p>3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacteria of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period.</p> <ul style="list-style-type: none">• \nexistsIf patient had an indwelling urinary catheter in place for >2 calendar days, and catheter was in place on the date of event or the previous day the CAUTI criterion is met. If no such indwelling urinary catheter was in place, UTI (non-catheter associated) criterion is met.• *With no other recognized cause <p>Note: Fever and hypothermia are non-specific symptoms of infection and cannot be excluded from UTI determination because they are clinically deemed due to another recognized cause.</p>

Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

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

- | | |
|--|--|
| | <p>1. Patient with* or without an indwelling urinary catheter has <u>no</u> signs or symptoms of SUTI 1 or 2 according to age (Note: Patients > 65 years of age with a non-catheter-associated ABUTI may have a fever and still meet the ABUTI criterion)</p> <p>and</p> <p>2. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacteria of $\geq 10^5$ CFU/ml (see Comment section below).</p> <p>and</p> <p>3. Patient has a positive blood culture with at least one matching bacteria to the urine culture, or meets LCBI criterion 2 (without fever) and matching common commensal (s) in the urine. <u>All elements of the ABUTI criterion must occur during the Infection Window Period.</u></p> <ul style="list-style-type: none"> *Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place on the date of event or the day before. |
|--|--|

Comment

“Mixed flora” is not available in the pathogen list within NSHN. Therefore it cannot be reported as a pathogen to meet the KNHSS UTI criteria. Additionally, “mixed flora” represent at least two species of organisms. Therefore an additional organism recovered from the same culture, would represent >2 species of microorganisms. Such a specimen also cannot be used to meet the UTI criteria.

Urinary System Infection (USI) (formerly OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperitoneal or perinephric space)

Other infections of the urinary tract must meet at least one of the following criteria

1. Patient has microorganisms isolated from culture of fluid (excluding urine) or tissue from affected site.

2. Patient has an abscess or other evidence of infection on gross anatomical exam, during invasive procedure, or on histopathologic exam.

3. Patient has at least one of the following signs or symptoms:

- fever (>38.0°C)
- localized pain or tenderness*

And at least one of the following:

- purulent drainage from affected site
- organisms cultured from blood and imaging test evidence of infection (e.g., ultrasound, CT scan, magnetic resonance imaging[MRI], or radiolabel scan [gallium, technetium]).

4. Patient ≤1 year of age has at least one of the following signs or symptoms:

- fever (>38.0°C)
- hypothermia (<36.0°C)
- apnea*
- bradycardia*
- lethargy*
- vomiting*

And at least one of the following

- purulent drainage from affected site
- organisms cultured from blood and imaging test evidence of infection, (e.g., ultrasound, CT scans, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).

- *With no other recognized cause

Notes:

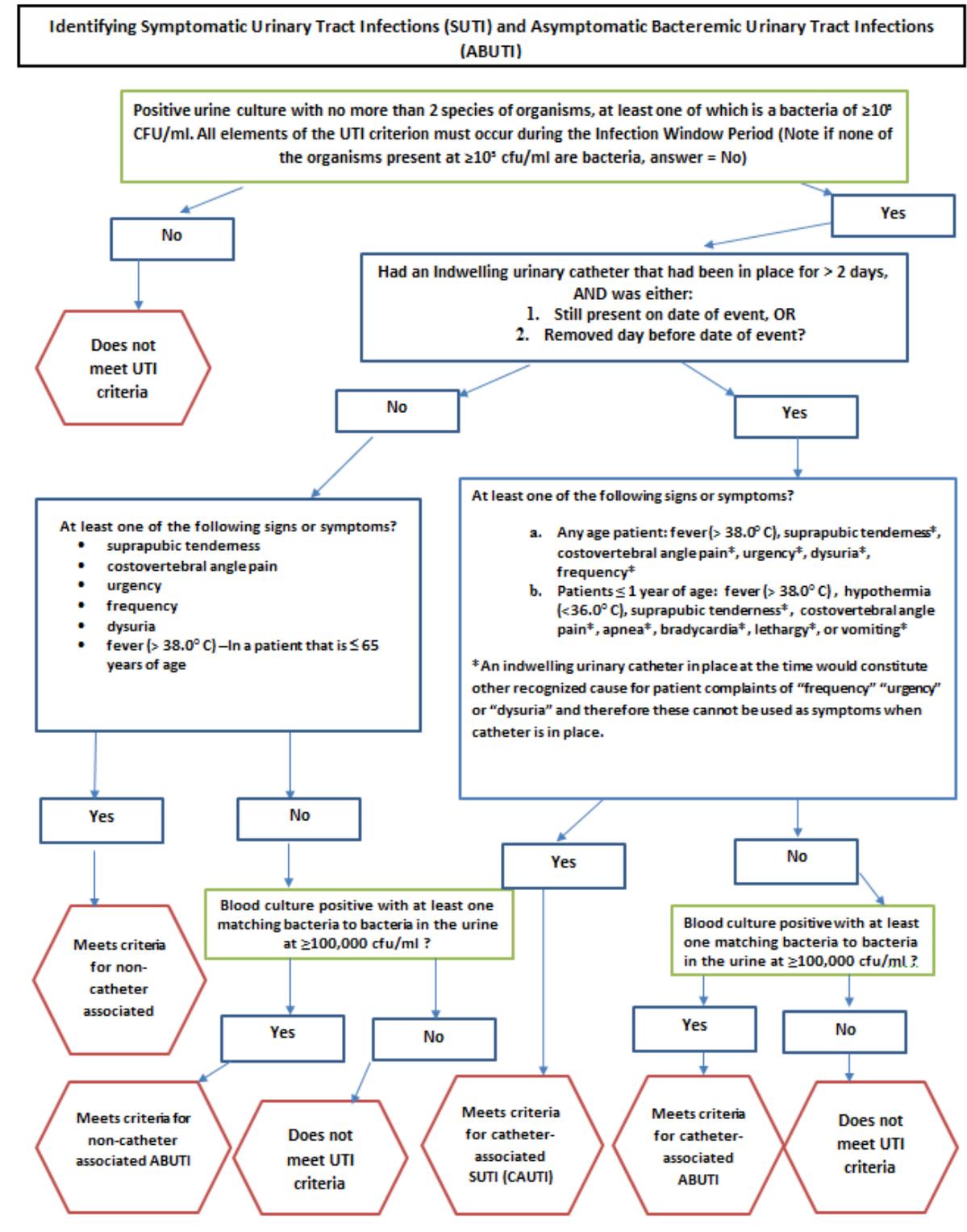
- Fever and hypothermia are non-specific symptoms of infection and cannot be excluded from UTI determination because they are clinically deemed due to another recognized cause.
- All elements of the USI criterion must occur during the Infection Window Period.

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Comments	
	<ul style="list-style-type: none">• For KNHSS reporting purposes, Urinary System Infection (USI) cannot be catheter associated, therefore, USI will only present as specific event type if urinary catheter status is marked “NEITHER”.• Report infections following circumcision in newborns as SST-CIRC.• If patient meets USI criteria and they also meet UTI criteria, report UTI only, unless the USI is a surgical site organ/space infection, in which case, only USI should be reported.• If patient has epididymitis, prostatitis, or orchitis and meets Other infection of the male or female reproductive tract (OREP) criteria (<i>see CDC/NHSN Surveillance Definitions chapter</i>), and they also meet UTI criteria, report UTI only, unless the OREP is a surgical site organ/space infection, in which case, only OREP should be reported.• Non bacterial pathogens are accepted for USI

Figure 3: Identifying SUTI and ABUTI flowchart



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Numerator Data: The *Urinary Tract Infection (UTI)* form is used to collect and report each UTI that is identified during the month selected for surveillance. The Instructions for Completion of Urinary Tract Infection form include brief instructions for collection and entry of each data element on the form.

Denominator Data: Device days and patient days are used for denominators. The method of collecting device-day denominator data may differ depending on the location of patients being monitored. The following method is used:

Denominator Data Collection Method	Details
Manual, Daily (i.e., collected at the same time every day of the month)	<ul style="list-style-type: none">• Denominator data are collected at the same time, every day, per location.• For all locations, count at the <u>same time each day</u>...<ul style="list-style-type: none">➤ number of patients➤ number of patients with an indwelling urinary catheter <u>at that time</u>• These daily counts are summed and only the total for the month is entered into KNHSS.• Indwelling urinary catheter days and patient days are collected separately for each of the locations monitored.

Data Analyses: The Standardized Infection Ratio (SIR) is calculated by dividing the number of observed infections by the number of predicted infections. The number of predicted infections is calculated using CAUTI rates from a standard population during a baseline time period, which represents a standard population's CAUTI experience.

Notes:

- The SIR will be calculated only if the number of predicted CAUTIs (number Expected) is ≥ 1 to help enforce a minimum precision criterion.
- "Predicted" is referred to as "expected".

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

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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 ICUs 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.

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