***NQF Question:*** *Provide the measure title.*

Inappropriate diagnosis of urinary tract infection (UTI) in hospitalized medical patients

Abbreviated form: Inappropriate Diagnosis of UTI

***NQF Question:*** *Provide a brief description of the measure.*

* *Including type of score, measure focus, target population, timeframe, (e.g., Percentage of adult patients aged 18-75 years receiving one or more HbA1c tests per year).*

The inappropriate diagnosis of UTI in hospitalized medical patients (or “Inappropriate Diagnosis of UTI”) measure is a process measure that evaluates the annual proportion of hospitalized adult medical patients treated for UTI who do not meet diagnostic criteria for UTI (thus are inappropriately diagnosed and overtreated).

***NQF Question:*** *Attach the data dictionary, code table, or value sets (and risk model codes and coefficients when applicable). Excel formats (.xlsx or .csv) are preferred.*

Excel file attached – Data\_Dictionary\_UTI\_Measure

* Tab 1: Detailed Inclusion Criteria
* Tab 2: Detailed Exclusion Criteria
* Tab 3: Signs and Symptoms
* Tab 4: Systemic inflammatory response syndrome (SIRS) Criteria and Organ Dysfunction Definitions
* Tab 5: Excluded Urine Culture Organisms
* Tab 6: Eligible Antibiotics for Inclusion Criteria

***NQF Question:*** *State the numerator.*

* *Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome).*

The measure quantifies adult, hospitalized medical patients inappropriately diagnosed with UTI. Here, inappropriate diagnosis is defined as patients treated with antibiotics for UTI who do not meet diagnostic criteria for UTI. Patients were considered inappropriately diagnosed if they received antibiotic therapy for a UTI but did not have at least one sign or symptom of a UTI.

***NQF Question:*** *Provide details needed to calculate the numerator.*

* *All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets.*
* *Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.*

Patients in the numerator include those that a) received antibiotics for a UTI but did not have b) ≥1 sign or symptom of a UTI (documented at some point in the day prior to admission through the first 2 days of hospitalization). Signs and symptoms of UTI (any allowed) are found in the attached excel file.

* Minor numerator exclusions:
  + Those with a blood culture positive for a pathogenic bacteria (1.8% [91/4961])

Signs (e.g., fever) and symptoms (e.g., dysuria) of UTI are found in the attached excel file. Abstractors are asked to review the medical record for documentation of any signs or symptoms in the day prior to obtaining a urine culture (called day -1), the day of the urine culture (day 0), or the two days following the urine culture (days 1, 2). Any combination of 1 or more symptoms at any point in this time frame is required to be considered appropriately diagnosed. The exception is patients with new onset mental status changes. Consistent with the recent IDSA guidelines, patients with newly onset mental status changes have to have signs of a systemic infection (i.e., leukocytosis, hypotension, > 2 systemic inflammatory response syndrome [SIRS] criteria) to be considered a UTI. Any patients without signs and symptoms of a UTI are placed in the numerator.

***NQF Question:*** *State the denominator.*

* *Brief, narrative description of the target population being measured.*

The denominator includes all adult, general care, immunocompetent, medical patients hospitalized and treated for UTI who do not have a concomitant infection.

***NQF Question:*** *Provide details needed to calculate the denominator.*

* *All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets.*
* *Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.*

The denominator includes all sampled patients eligible for abstraction during the measure period (typically annual measurement). To be considered “treated for a urinary tract infection,” a patient had to: a) have a positive urine culture, b) receive antibiotic therapy, and c) not have a concomitant infection. Please see excel file (inclusion criteria tab) for detailed operationalized definitions.

Inclusion criteria:

* Adult patient admitted and discharged from the participating hospital
* With a positive urine culture (except for excluded organisms listed in data dictionary) during hospitalization.
* Admitted to a general care medicine service
* Received any eligible antibiotic during the symptom collection window (day -1, 0, 1, 2, where the day 0 = day of first positive urine culture)
* Immunocompetent (allowing for mild immune suppression)
* Do not have a concomitant infection (e.g., COVID-19, antibiotic treatment for unrelated infection or prophylaxis)
* Have normal urinary anatomy

Exclusion Criteria:

* Left against medical advice or refused medical care
* Admitted on hospice
* Pregnant or breastfeeding
* Spinal cord injury
* UTI-related complication (e.g., perinephric abscess)
  + Operationalized as >14 days of antibiotics at discharge

***NQF Question:*** *Provide details needed to calculate the denominator exclusions.*

* *All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.*

Inclusion and exclusion codes and criteria are provided in the attached excel file.

***NQF Question:*** *Diagram or describe the calculation of the measure score as an ordered sequence of steps. \**

* *Identify the target population; exclusions; cases meeting the target process, condition, event, or outcome; time period of data, aggregating data; risk adjustment; etc.*

The measure estimates hospital-level inappropriate diagnosis of UTI. If the hospital has elected to sample patients, they will generate a sample by first identifying all hospitalized patients with a positive urine culture (using institutional definition of positive) during that month or quarter (based on whether they elect to sample monthly or quarterly). Next, they will apply electronic inclusion criteria (medicine admission, antibiotic receipt during window period [day -1 to day +2]) to either their quarterly or monthly patient sample. The resulting list will be randomized, and patients screened in order of randomization. First, patients are screened for inclusion in the denominator. All adult, general care, medical patients hospitalized and treated for UTI are potentially eligible. If the patient meets eligibility criteria and does not have any exclusions, they are placed in the denominator. Patients automatically excluded from the numerator are those with blood cultures positive for a pathogenic organism. Patients are then assessed for whether they meet diagnostic criteria for UTI (i.e., do they have at least one sign or symptom of a UTI). If a patient does NOT meet diagnostic criteria they are placed in the numerator. A lower score is considered better diagnostic quality for UTI.

***NQF Question****: If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.*

Sampling: Hospitals have the option to sample from their population or submit their entire population. Hospitals also have the option to sample quarterly or monthly. Over the entire year, 63 cases are recommended for the denominator. Thus, hospitals whose Initial Patient Population size is less than or equal to the minimum number of cases per quarter (N=16) or month (N~6) for the measure should not sample and rather, should include all cases. A hospital may choose to use a larger sample size than is required.

Sampling Procedures:

Potentially eligible patient lists should be reviewed monthly or quarterly (as desired). Lists will be determined by the ability of the facility however we suggest electronically including the following criteria:

* Initial sample based on positive urine culture
* Exclude patients who did not receive antibiotics during hospitalization (if able, can refine to day -1 to day +2 with day 0 being date of urine culture collection)
* Exclude patients admitted to a non-medicine service
* Exclude patients admitted to intensive care

Regardless of the option used, hospital samples must be monitored to ensure that sampling procedures consistently produce statistically valid and useful data. Due to exclusions, hospitals selecting sample cases MUST submit AT LEAST the minimum required sample size.

Eligible lists should then be randomized and reviewed in order until the desired number of cases is included (5-6/month or 16 per quarter).

Minimum Sample Size:

Using the spearman brown prophecy, we evaluated the number of cases needed to reach each reliability threshold:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Reliability | 0.6 | 0.7 | 0.8 (standard) | 0.9 |
| Number of annual cases needed | 24 | 37 | **63** | 141 |

Based on these data, for a desired reliability of 0.8, each hospital would need to abstract 63 cases annually or 5-6 cases per month.

***NQF Question:*** *Identify the specific data source or data collection instrument. \**

*For example, provide the name of the database, clinical registry, collection instrument, etc., and describe how data are collected.*

Electronic medical record data. The data collection instrument is provided. Those interested in using our online REDCap tool may also contact us directly to coordinate.