Kansas
Department of Health and Environment

Urinary Tract Infection Toolkit

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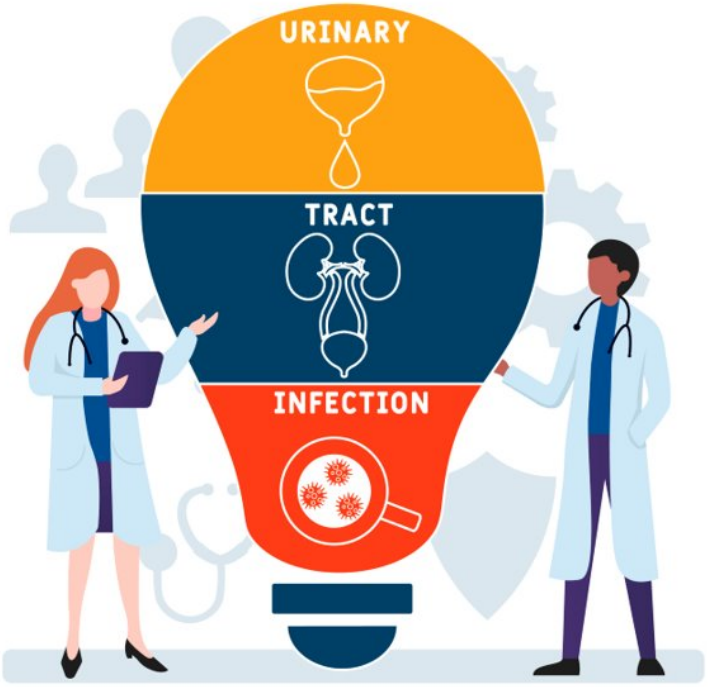
Executive Summary



The purpose of this urinary infection toolkit is to provide practitioners, healthcare facilities and patients with the tools and guidance needed to improve the evaluation and management of those with urinary tract infections, urinary retention, indwelling urinary catheters, and to reduce the risk of infections and subsequent exposure to antibiotics that increase the risk for multidrug-resistant infections.

Created by the Kansas Department of Health and Environment's Healthcare-Associated Infections and Antimicrobial Resistance (HAI/AR) Section, in partnership with the Kansas Foundation for Medical Care (KFMC) Health Improvement Partners and the Kansas HAI/AR Advisory Group, the toolkit includes downloadable PowerPoint catheter education, editable treatment guidelines, urinary antibiogram, decision support tools, catheter and infection tracking spreadsheets, and strategies for practice change. We hope this will assist Kansas healthcare facilities of all types in developing their own unique infection prevention and antibiotic stewardship programs.

Thank you for reading and for helping us to improve healthcare in Kansas!

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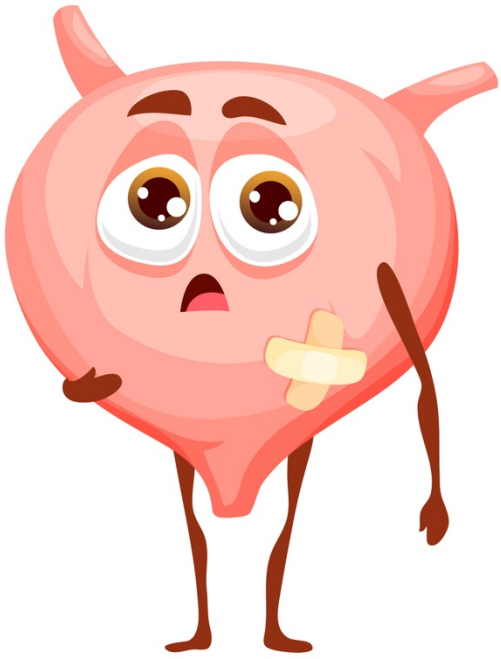
Introduction



Each year urinary tract infections (UTI) and catheter associated urinary tract infections (CAUTI) contribute to 60 million hospital visits, over 10 million outpatient visits, and add over $25 billion to US healthcare costs.[1-3] Unfortunately the rates of UTIs have increased ~ 3% each year over the past decade.[3]

Inappropriate antibiotic use related to these infections ranges from 38 to 75%.[4] Subsequently this is an issue we should strive in healthcare to optimize diagnosis and management of and attempt to prevent future infections where possible.

Why Use this Toolkit?

Many long-term care facilities (LTCF), clinics and hospitals focus primarily on education in attempts to improve UTI diagnoses and treatment. Unfortunately, education alone does not always translate to sustained practice change. UTI and CAUTI quality improvement initiatives which target both the systems **and** people are most effective.[5] The first half of this toolkit reviews asymptomatic bacteriuria versus UTI and how they are differentiated, with a thorough discussion of the limitations of urine dipsticks compared to urinalysis and cultures before reviewing urinary catheters, urinary incontinence treatment options. The latter part of the toolkit discussions how to develop and implement a UTI program to improve your facility's diagnosis and treatment of UTI and CAUTIs.

Asymptomatic Bacteriuria

Asymptomatic bacteriuria (ASB) is when bacteria are in the urine but there are **no symptoms**. ASB is a normal occurrence because urine passes through the urethra, where bacteria generally reside. Bacteriuria ranges from 5% in healthy premenopausal women up to 100% in people with long-term indwelling catheters (e.g., suprapubic catheters).[6]

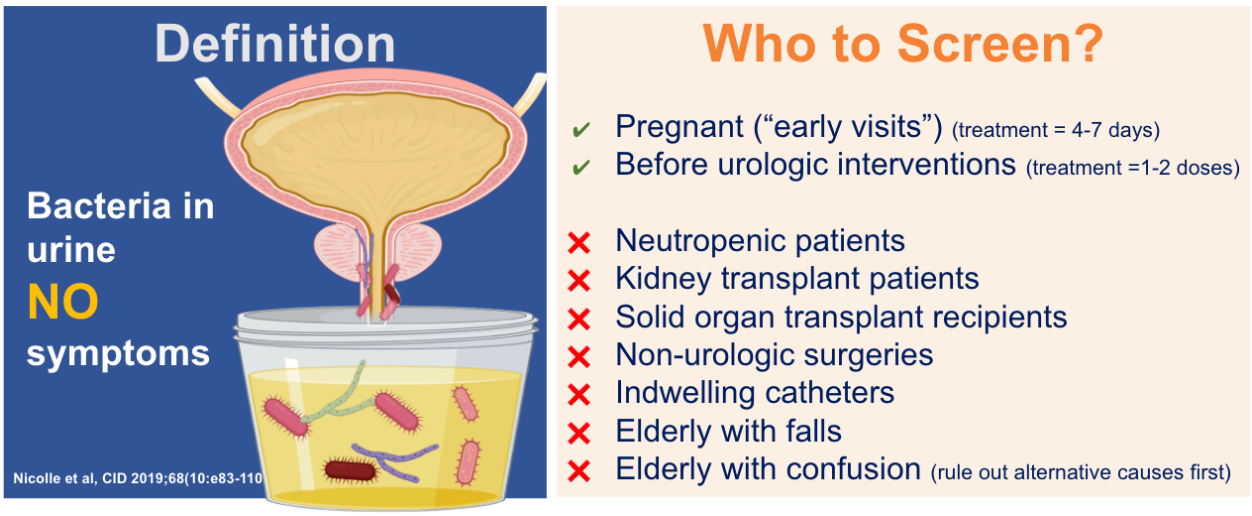
Prevalence of asymptomatic bacteriuria in selected populations

Population	Prevalence (%)
Healthy premenopausal women	1.0 – 5.0
Pregnant women	1.9 - 9.5
Post-menopausal women aged 50-70	2.8 – 16
Diabetic women Diabetic men	9.0 – 27.0 0.7 – 11.0
Women in LTC Men in LTC	25 – 50 15 - 40
Patients performing clean intermittent catheterization (CIC)	23 – 89
Patients on hemodialysis	28
Patients with indwelling short-term cath Patients with indwelling long-term cath	9 – 23 100

Source: Nicolle et al, CID 2019;68(10:e83-110.

Who is Tested for Asymptomatic Bacteriuria

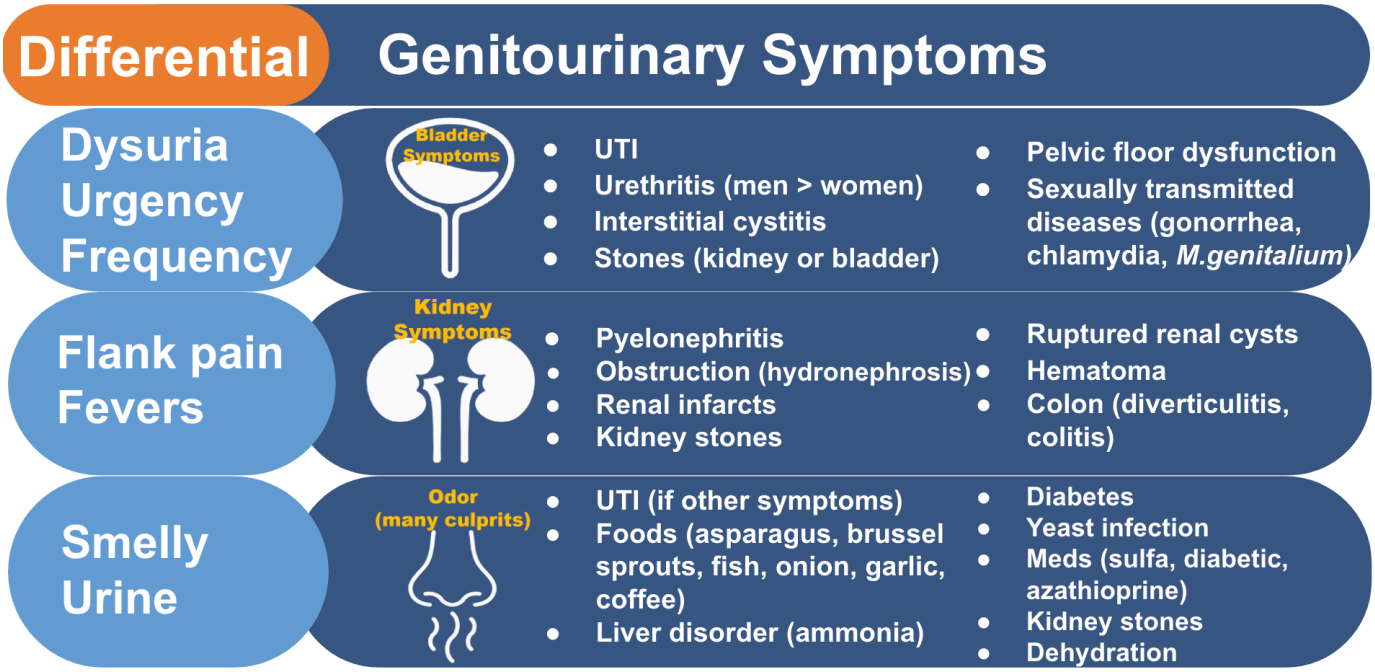
There are very few instances in which a urinalysis (UA) should be used to screen for ASB, these include pregnant females (first trimester visit) and in those undergoing urologic procedures. There is no evidence that other populations should be screened if there are no symptoms, including immunosuppressed people, people with kidney transplants or neutropenia, nor for those undergoing non-urologic procedures or surgeries.[6]



Urinary Tract Infection

A UTI encompasses infections of the bladder (i.e., cystitis) or kidney (i.e., pyelonephritis). However, cystitis also generally means “inflammation of the bladder”. Bladder inflammation may be caused by UTI, but it also may be caused by urethritis (e.g., gonorrhea or chlamydia), interstitial cystitis, kidney stones, or instrumentation.

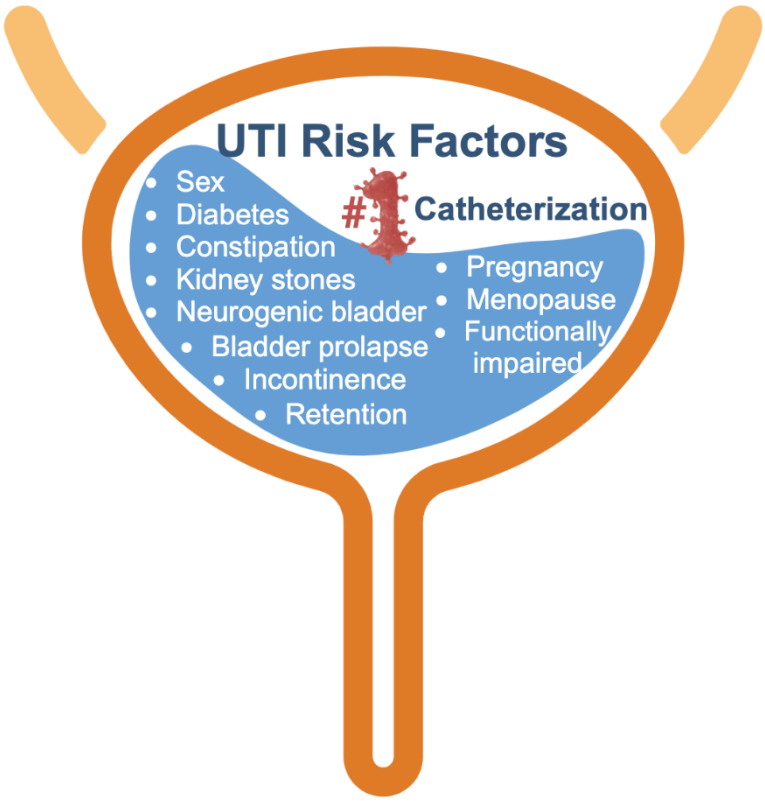
There are also a broad range of symptoms that people may report, and not all of them are indicative of infection. For instance, urine smell may be the result of certain foods, medications, liver disease, diabetes, and even dehydration. However, without other symptoms urine smell is not indicative of a UTI. Urinary infection may manifest as dysuria, urgency, frequency, pelvic or flank pain. Similarly, there are many non-infectious causes of these symptoms. Therefore, a good history combined with a UA are critical to making the correct diagnosis.



Risk Factors

There are many risk factors for UTIs and pyelonephritis,[1] including:

- Sexual intercourse (introduce bacteria)
- Diaphragms (block urine)
- Spermicides
- Post-menopausal women (low estrogen increases mucosal dryness and decreases protective good bacteria with lactobacilli)
- Bladder and kidney stones
- Pregnancy
- Diabetes
- Functional or mental impairments
- Incontinence
- Constipation
- Bladder prolapse (increased risk with multiple pregnancies)
- Neurogenic bladder
- Urinary retention
- Catheterization



Diagnosis

Predictive Value of Symptoms and Urinalysis

Any single genitourinary (GU) symptom in isolation is poorly predictive of a UTI, however when combined the likelihood of infection increases.

Predictive Value of Symptoms & Tests	
Symptom	**Likelihood Ratio (95% CI)**
Burning	**1.09** (0.97 - 1.22)
Urgency	**1.29** (1.12 - 1.50)
Frequency	**1.16** (1.06 - 1.28)
Painful voiding	**1.31** (1.12-1.54)
Symptoms + UA WBCs	**1.67** (1.39 - 2.01)
Symptoms + UA nitrate	**5.41** (3.19 - 9.18)
Symptoms + UA WBC + nitrate	**7.52** (3.84 - 14.73)

Urine Dipstick versus Urinalysis

A urine dipstick provides a fraction of the details compared to a urinalysis (UA). Urine dipstick involves dipping a reagent paper strip in urine, whereby 10 chemical pads or reagents turn positive when a certain reaction occurs. A few of the reagents may sometimes be helpful in diagnosing a UTI (i.e., leukocyte esterase, nitrites) however most of the reagent strip provides no details regarding infection (e.g., pH, hemoglobin, specific gravity, glucose, bilirubin, ketones).

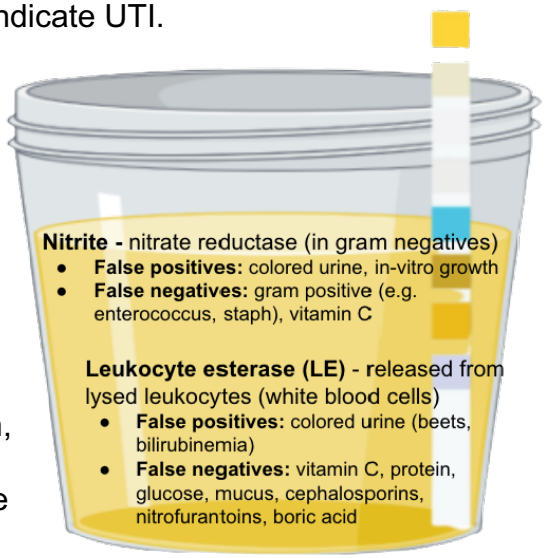
The dipstick leukocyte esterase tests for the breakdown product of leukocytes (white blood cells or WBCs), but does not determine if WBCs are present, or how many are present. Nitrites are a breakdown product of gram-negative bacteria, yet the nitrite reagent is poorly predictive of whether a gram negative is present are not. This is why the urinalysis is so much more helpful - it *quantifies* WBCs and provides a microscopic description to determine quality (e.g., heavy mucus and squamous cells suggest contamination), and can be reflexed to a culture to determine which, if any, bacteria are present.

Test	Dipstick	Urinalysis
Definition	• Urine sampled by dipping paper strip into urine	• Urine test analyzed by variety of parameters
Method	• Dip strip paper into urine	• Urine appearance, content, concentration
Analysis	• Change of color on strip	• Cloudy or clear urine solution • Presence of substances (protein, blood, glucose)
Components	• Reagent strip (chemical analysis)	• Macroscopic (appearance, clarity) • Reagent strip (chemical) • Microscopic (WBC, squamous)
Advantage	• Fast • Cheap	• Cheap • More details

Urinalysis Interpretation

The most obvious indicator of infection is the presence of bacteria. Bacteria are often quantified in terms of the number in a high-power field (HPF). The general UTI threshold of 5+ bacteria is roughly 100,000 colony forming units (CFUs)/mL.[7] Low bacterial counts in the urine are in the 2+ (100 CFU/mL) to 3-4+ (300-1000 CFU/mL) range. This number of bacteria per mL is unlikely to represent infection, however if symptoms are suggestive any quantity may indicate UTI.

Pyuria indicates urinary WBCs, or positive leukocyte esterase (since WBC or leukocyte breakdown release the leukocyte esterase). Although pyuria is a poor marker of infection (nearly a third of healthy young women have pyuria), it's **absence** virtually eliminates infection as a cause, with a negative predictive value of nearly 90%.[7.]

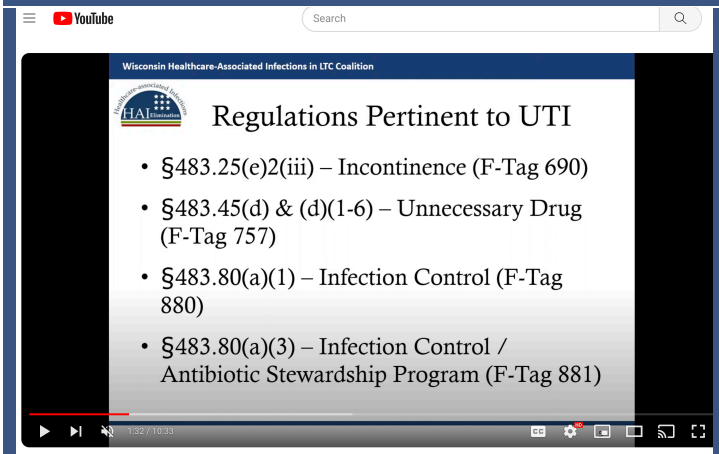


Nitrites indicates the presence of gram-negative bacteria that are nitrate reducers (e.g., *Escherichia coli* [*E. coli*]). However, for many types of bacteria (and yeast) that might be causing infection, nitrite has a very low sensitivity. False positives can occur if urine is exposed to phenazopyridine (an over-the-counter pain medicine for urinary pain also known as AZO or Pyridium).

Epithelial cells (i.e., squamous cells) indicate contamination from the urethra, because the urine picks up epithelial cells as it passes through, as well as mucus. When the UA has > 5 squamous cells/HPF or there is heavy mucus, this is frequently indicative of a poor sample and should be recollected.[7]

For everything you wanted to know (or not know) about the urinalysis check out this article

Staff Resource Library



WI LTC UTI Toolkit - Module 1: Overview & Rationale - Section 3: Regulatory Rationale

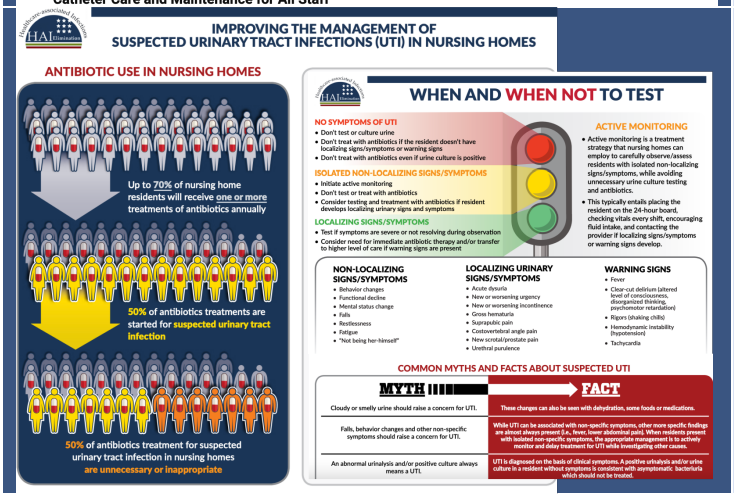
Educational training for IPs and administration

- Regulatory Overview for Improving UTIs in LTCs (video)
- Role playing UTI symptoms, when to order UA (PowerPoint)
- Role player facilitator guide (Word)
- Role play worksheet (Word)
- Urine culture tracking (Excel)
- Policy algorithm for when to test (Word)
- SBAR Tool for suspected UTI (Word)
- Policy and Protocol for urinary catheter placement and nurse-driven removal (PDF)
- HAI tracking for catheter days, CAUTIs (Excel)

Catheter Care and Maintenance for All Staff

Educational training for staff

- Catheter care and maintenance (video)
- Female urethral catheterization (video)
- Male urethral catheterization (video)
- Cath care for unlicensed staff (video)
- Cath care for licensed staff (video)
- Hand hygiene (video)
- Catheter care and maintenance (quiz)



Post staff and provider information -these materials from the University of Wisconsin

- UTI stoplight (infographic)
- When to test (nursing algorithm)
- Leg-bags FAQ (LTC-oriented)

Urinary Indwelling Catheters

Among UTI diagnosed in the hospital or long-term care settings, approximately 75% are associated with a urinary catheter.[8] The single greatest risk factor for developing a catheter associated urinary tract infection (CAUTI) is the presence of an indwelling urinary catheter.

Indications for an Indwelling Urinary Catheter

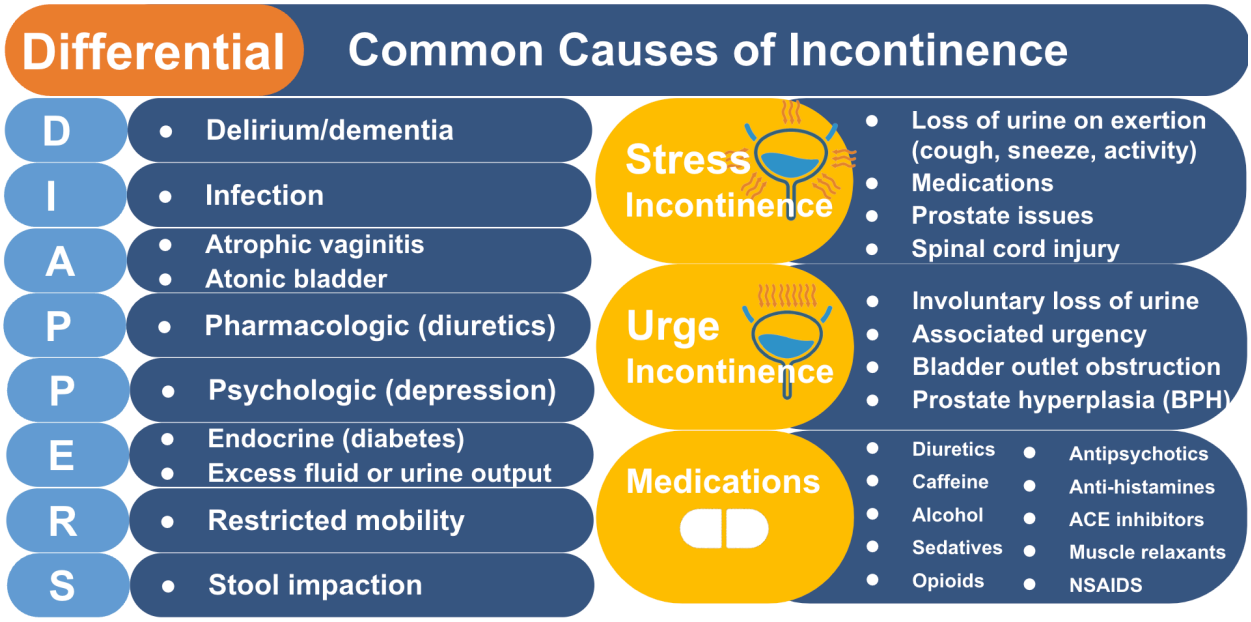
When the bladder reaches a volume of ~200-400 mL the wall stretches, and a neurologic signal is sent to the brain indicating it is full and time to void. When this signal does not happen at this volume the bladder retains urine. Urinary retention is one of the most common reasons an indwelling urinary catheter is placed.

Retention is most commonly the result of neurologic bladder (e.g., spinal cord injury, cerebral palsy), however there are many other culprits including medications (e.g., anticholinergics including antipsychotics, antidepressants, opioids) and obstruction (e.g., enlarged prostate, constipation). While urinary catheters are effective in relieving retention, they are associated with many complications including CAUTI, bladder and urethral trauma, fistulas (connections extending out from urethra), bladder cancer, and kidney or bladder stones.[13]

Category	Common Causes of Urinary Retention	
Neurologic	• Spinal cord injury • Cord compression	• Multiple sclerosis • Cerebral palsy
Medication	• Antidepressants (TCA) • Antipsychotics (haldol)	• Opioids • Diphenhydramine (benadryl)
Obstruction	• Enlarged prostate • Prostate cancer	• Bladder stones • Fecal impaction
Infection	• Urinary tract infection • Prostatitis	• Prostate abscess • Vulvovaginitis

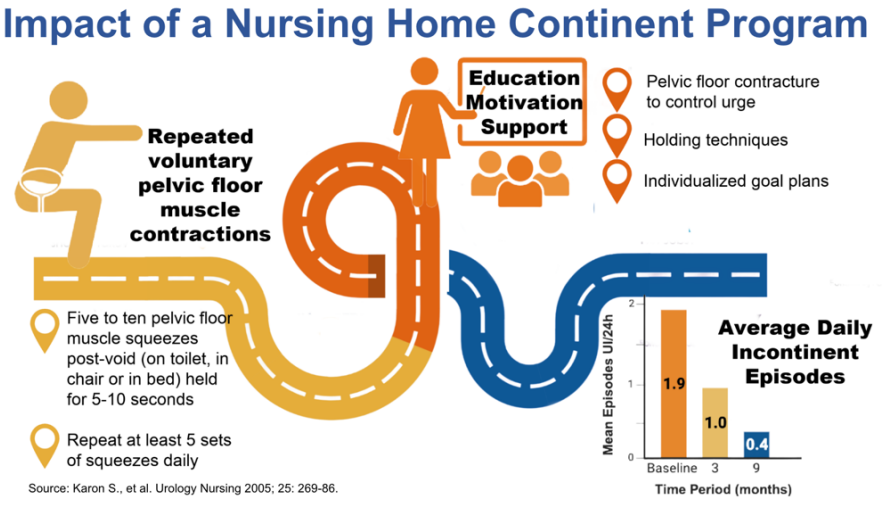
Avoid Urinary Catheter Placement for Management of Incontinence

While retention prevents incomplete bladder emptying, urinary incontinence (UI) results in uncontrolled urine leakage. Incontinence may result from chronic catheter use as muscle disuse occurs the longer the catheter remains in place. However, UI also frequently results in catheter placement, which should generally be avoided unless clear indications of a urinary catheter are present (e.g., healing perineal or sacral wounds, prolonged immobilization intended). A mnemonic to remember common causes of UI is DIAPPERS.



Incontinence affects over half of US women 60 and older, nearly one-third of women in their 30s, and 1 in 5 men over age 60.[15-16] Prevalence increases throughout the lifespan, with greater risks associated with increasing BMI, race (white have greater stress incontinence, black more urge incontinence), increased parity, history of hysterectomy, and diabetes. Incontinence is associated with twice the risk of major depression.[17] Additionally, in nursing homes it is estimated that the cost of UI care is >$6000/year in 2001 USD (gloves/PPE, laundry, diapers, time of certified aids) vs community-dwelling where the costs are 15 fold lower.[18] With such a significant burden on individual's mental health and costs to the healthcare field, it is amazing that only 3% of nursing home residents receive treatment for UI.[19] Educating nursing home staff regarding UI will improve resident's quality of life, reduce facility's financial burden, and reduce staff workload.[20]

Facilities can foster interdisciplinary care of continence through the creation of a "urine continent team" which includes nursing, physical therapy, nutrition (diabetic control and fluid intake are critical) and medical providers. A NH program demonstrated significant reductions in UI when this team-based approach is employed.[21] Bladder retraining involving pelvic floor muscle exercises is the first line treatment in UI, and the primary intervention involved pelvic floor muscle training to control urgency and incontinence. By 3 months UI episodes were reduced by half and by 79% at 9 months (1.9 episodes per day to 1.0 per day at 3 months and 0.4 episodes daily at 9 months, p<0.0001).



For more information on how to develop a comprehensive nursing home urinary continent program check out this training module from Vanderbilt University

Assessing for Urinary Incontinence

The following questions will assist in characterizing the nature of the UI issue.

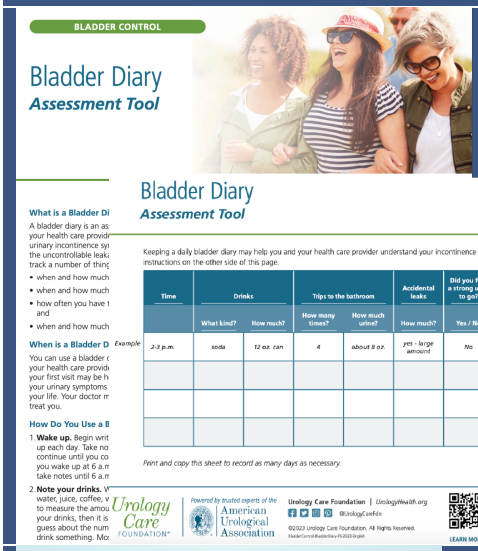
Assessment Questions for Urinary Incontinence	
Nature of the problem	• What type of problems are you having with urination? • How many times a day do you void? (average is 5x/day) • How many times do you get up at night to void? (average is 1x/day) • Has this pattern remained constant, or do you have different patterns on different days or different nights?
Urgency	• Do you have urgency (e.g., the sense of needing to urinate/void immediately)? • Do you ever lose urine with cough, sneezing, physical activity?
Onset and Duration	• When did you first notice a problem? • How long has this problem lasted? • Is there a certain time of day you notice symptoms occur more frequently?
Severity	• How many times a day or night do you urinate or have leakage? • What do you do when the symptoms occur?
Predisposing Factors	• Females: Have you ever had a vaginal birth? How many? • Do you notice what you are doing at the time of the incontinence? • Do your symptoms increase after drinking alcohol or caffeine? • Which medications do you take routinely, and have any changed recently? • Do you have a physical illness that interferes with your usually urinary pattern (e.g., heart failure requiring frequent diuretics, enlarged prostate)?
Effect on the patient	• How have these symptoms affected your life? • Have you had to change any or your usual activities? • Have you sought any healthcare assistance for this problem?

Adapted from Perry A., Stockert P., Hall A. (2013). Fundamentals of Nursing. Elsevier Health Sciences.

Patient Educational Resources for Urinary Incontinence

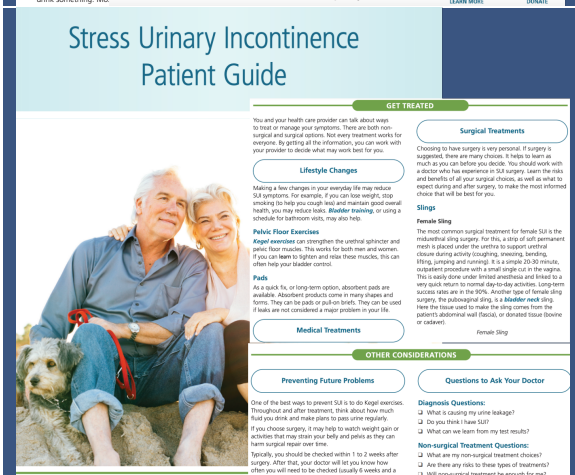
The American Urologic Association has created great resources for patients to understand incontinence, how to track their symptoms to understand triggers, and pelvic muscle strengthening and relaxation techniques to improve bladder control.

Patient Education Library



Ask patients to keep a diary for 2-3 days to better understand the UI trigger, symptoms in order to better control it.

- Bladder diary assessment tool
- Order free diary tools here



Urinary incontinence patient information provides information on types of UI, lifestyle management, medical and surgical treatment options.

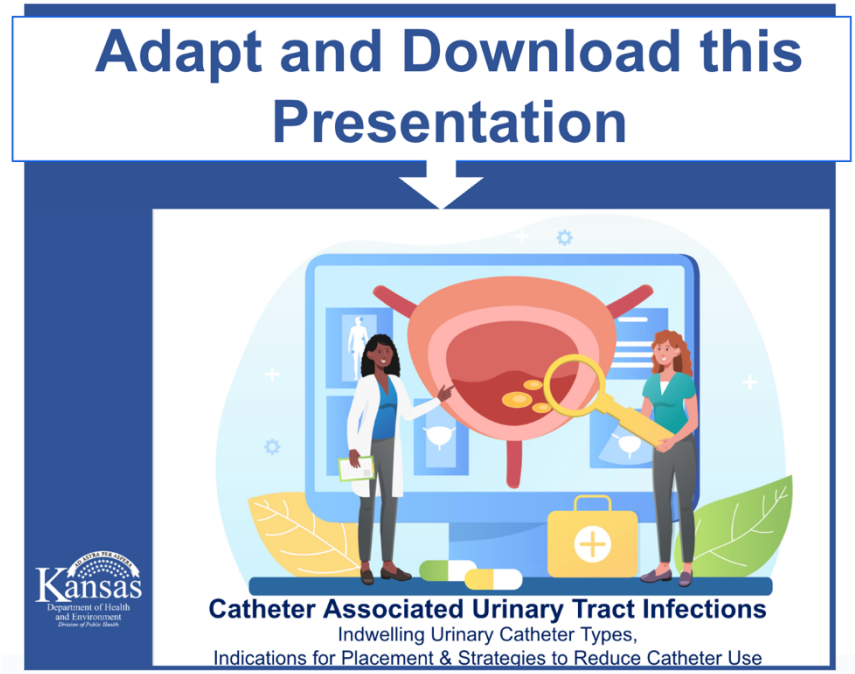
- Stress incontinence guide
- Treatment for women
- Treatment for men
- Order free guides here

Pelvic floor muscle strengthening and relaxation techniques to help UI symptoms.

- Pelvic floor relaxation techniques
- Pelvic floor strengthening
- Order free guides here

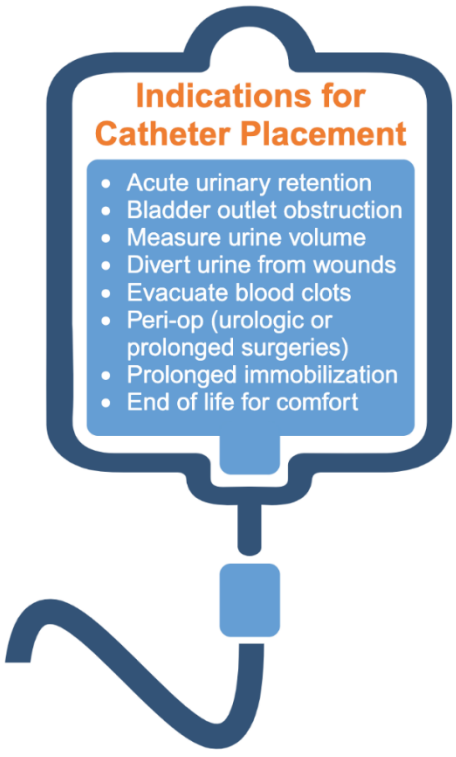
Urinary Catheters and Diversion Methods

Understanding the various catheter types (e.g., foley, 2-way catheter, 3-way catheter, “balloon” catheter, coated foleys.), indications, and not to mention the terminology (e.g., ileostomy vs ileal conduit) is confusing to healthcare providers and patients alike. This educational presentation describes the types of catheters, alternatives to indwelling urethral catheters (i.e., condom catheters and external wicking devices), types of urinary diversions encountered, and a review of the risks related to long-term catheter use. This presentation is intended to be adapted and customized to your unique population’s catheter needs and healthcare staff’s knowledge.



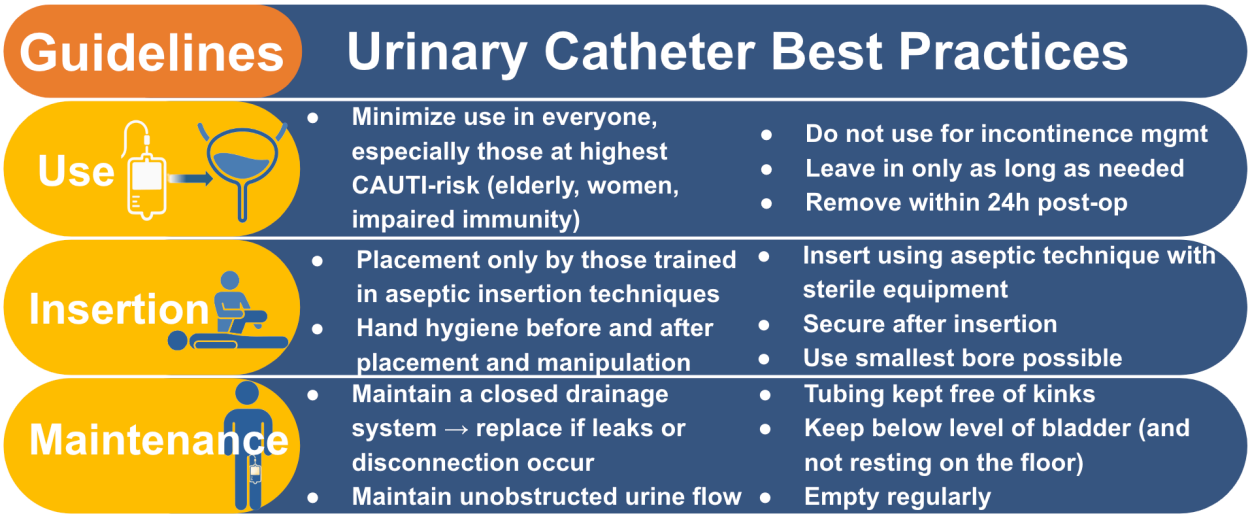
Indications for Urinary Catheter Use, Insertion and Maintenance

The CDC Guidelines for Prevention of CAUTIs discuss best practices for appropriate catheter use, insertion and maintenance. The first step in urinary catheter management is assessing for appropriate use. Acute urinary retention, bladder outlet obstruction or diversion from healing perineal or sacral wounds are all indications for placement.



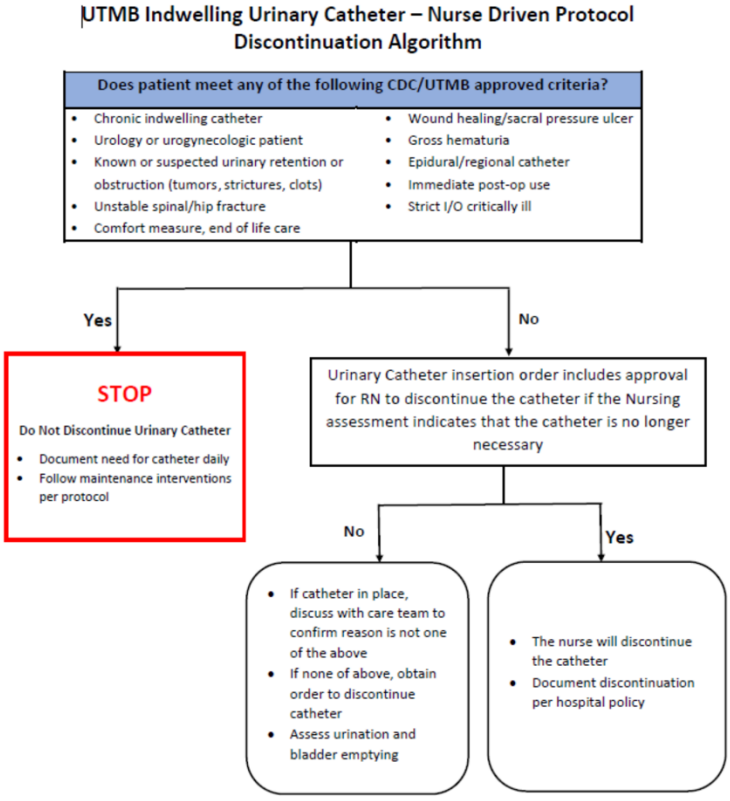
Inappropriate use of urinary catheters includes managing urinary incontinence as substitute for nursing care, as a means of obtaining urine for culture or diagnostic testing when patient can voluntarily void or prolonged post-operative placement without clear need or immobilization indication.[14]

Once a catheter has been deemed necessary, leave in only as long as needed and generally they should be removed within 24 hours post-op. Insertion of catheters should be performed only by those who have completed training in placement. Hand hygiene is critical before and after insertion and aseptic technique using sterile equipment is important to reduce introduction of pathogens with the catheter.



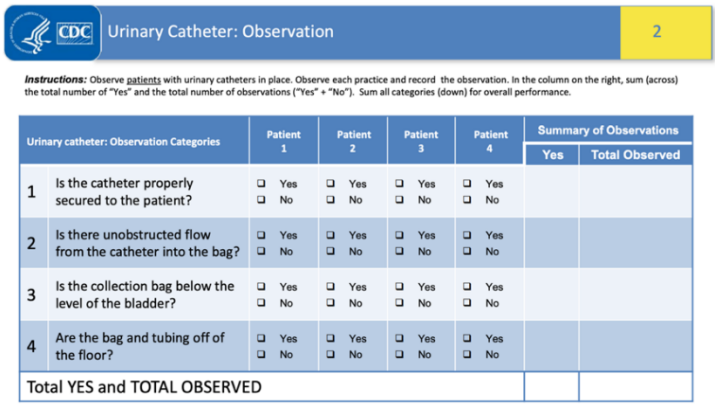
Source: CDC CAUTI Prevention Guidelines, https://www.cdc.gov/infectioncontrol/guidelines/cauti/recommendations.html

Additionally, nurse-driven protocols and policies indicating when catheters are indicated and can be removed are effective in reducing unnecessary catheter utilization. Adapt this policy and protocol if your facility doesn't already have guidance.



Roleplaying is an effective way for nursing education and training. The Agency for Healthcare Research and Quality (AHRQ) provides instructions on a roleplaying activity with various scenarios to help staff determine catheter indications, practice placement and maintenance. It is important to train new staff on hire and then annually to evaluate and refresh staff's skills.

Patients with indwelling catheters must have the status of their catheter care periodically evaluated. Observation checklists are available from the CDC here.



CDC Urinary Catheter: Observation 2

Instructions: Observe patients with urinary catheters in place. Observe each practice and record the observation. In the column on the right, sum (across) the total number of "Yes" and the total number of observations ("Yes" + "No"). Sum all categories (down) for overall performance.

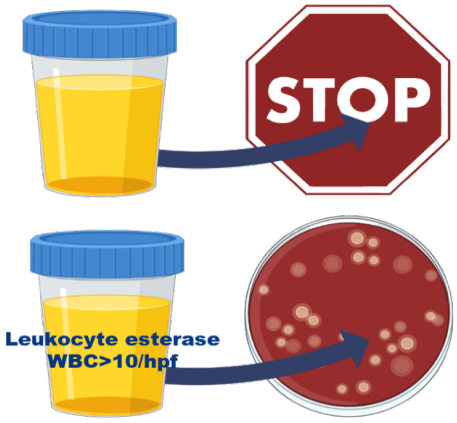
	Urinary catheter: Observation Categories	Patient 1	Patient 2	Patient 3	Patient 4	Summary of Observations	
						Yes	Total Observed
1	Is the catheter properly secured to the patient?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
2	Is there unobstructed flow from the catheter into the bag?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
3	Is the collection bag below the level of the bladder?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
4	Are the bag and tubing off of the floor?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
Total YES and TOTAL OBSERVED							

Urine Culture Stewardship

By focusing on testing only high pretesting probability scenarios (i.e., signs and symptoms) your facility and providers will reduce urine results which they do not know what to do. Avoid blanket or repeated UAs and culturing (e.g., neutropenic fevers, elderly with recurrent falls, confusion), and avoid "test of cure" samples when symptoms are resolved after treatment.

Reflex Urine Cultures

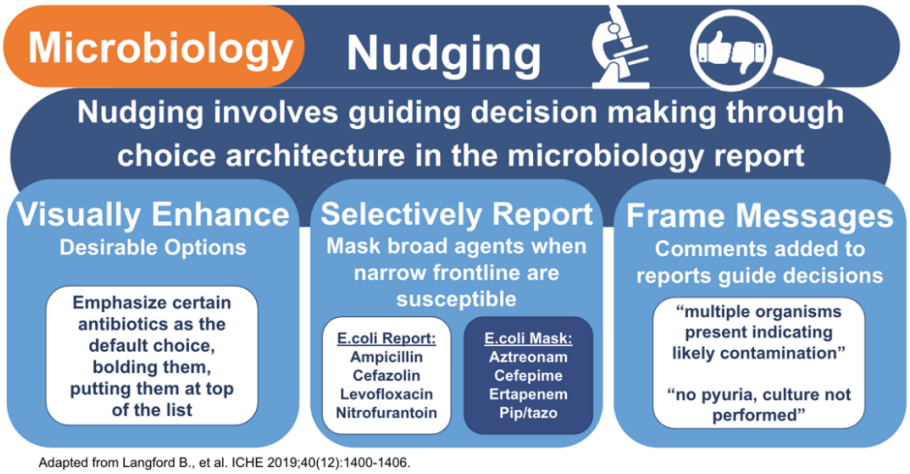
Ensure your lab is offering a UA with reflex (i.e., cultures are ordered only if certain criteria are present such as leukocyte esterase or WBC>10/hpf). Ensure the option remains for direct culture only for certain populations such as neutropenia or pre-urologic procedure.



Hospitals, clinics and health systems that implement these practices reduce inappropriate cultures by 40-50%, with resulting reductions in unnecessary antibiotic use.[9,10]

Microbiology Nudging

Micro nudges are endorsed by the Infectious Disease Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA) and the Clinical Laboratory Standards Institute (CLSI). Nudges come in several forms: 1) present desirable antibiotics (frontline, narrow) and hide undesirable (e.g., broad or costly), 2) frame recommendations to guide decisions or 3) visually enhance desired antibiotics.[22]



Adapted from Langford B., et al. ICHE 2019;40(12):1400-1406.

Antibiogram

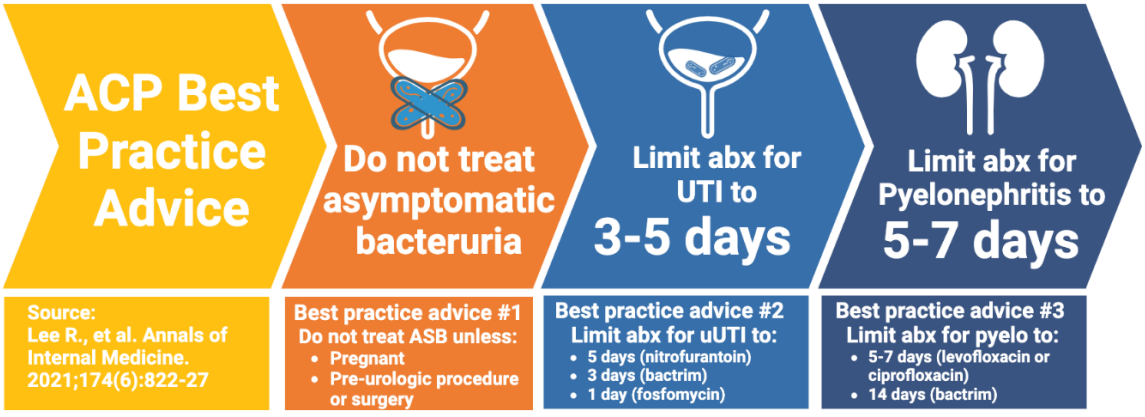
Your microbiology laboratory should also provide annual antibiograms. This urinary-specific antibiogram combines 2019-2020 Kansas isolates from over 60 facilities. View the full antibiogram for regional differences in susceptibilities. If you are unfamiliar with the antibiogram, learn how to decipher them.

Urinary Antibiogram

	Isolates	#	Amox/ clav	Amp/ sulb	Pip tazo	Cephalexin	Ceftriaxone	Cefepime	Cipro- floxacin	Levo- floxacin	Nitro- furantoin	TMP/s
Gram Negatives	Acinetobacter baumanii	176		94				79	89	81		84
	Enterobacter cloacae	1534			83			94	94	95		92
	Escherichia coli	31,872	85	63	97	86	94	95	81	82	96	77
	Klebsiella aerogenes	576			85		86	97	98	98	22	98
	Klebsiella oxytoca	792	94	63	91		95	97			87	
	Klebsiella pneumoniae	5942	95	86	96		96	97	96	97	48	92
	Proteus mirabilis	3385	96	85	98		97	97	67	70		74
	Pseudomonas aeruginosa	5017			91			91	86	80		
Gram Pos	Group B streptococcus	598	100				99			100		
	Enterococcus faecalis	4644	99						81	83	99	
	Enterococcus faecium	676	25						18	25	31	
	VRE.faecium	83	4								50	

https://www.kdhe.ks.gov/DocumentCenter/View/14422/2020-Kansas-Antibiogram-PDF

Treatment Guidelines



In order to encourage appropriate antibiotic prescribing, develop and provide facility guidelines to prescribers. Facility specific guidelines also serve to provide support to pharmacists and nurses in the LTC citing institutional standards for rotating clinicians. Additionally, any UTI stewardship initiative will need as it's backbone a guideline to reference.

Download these guidelines and adapt to your facility.

Adapt and Download these Guidelines

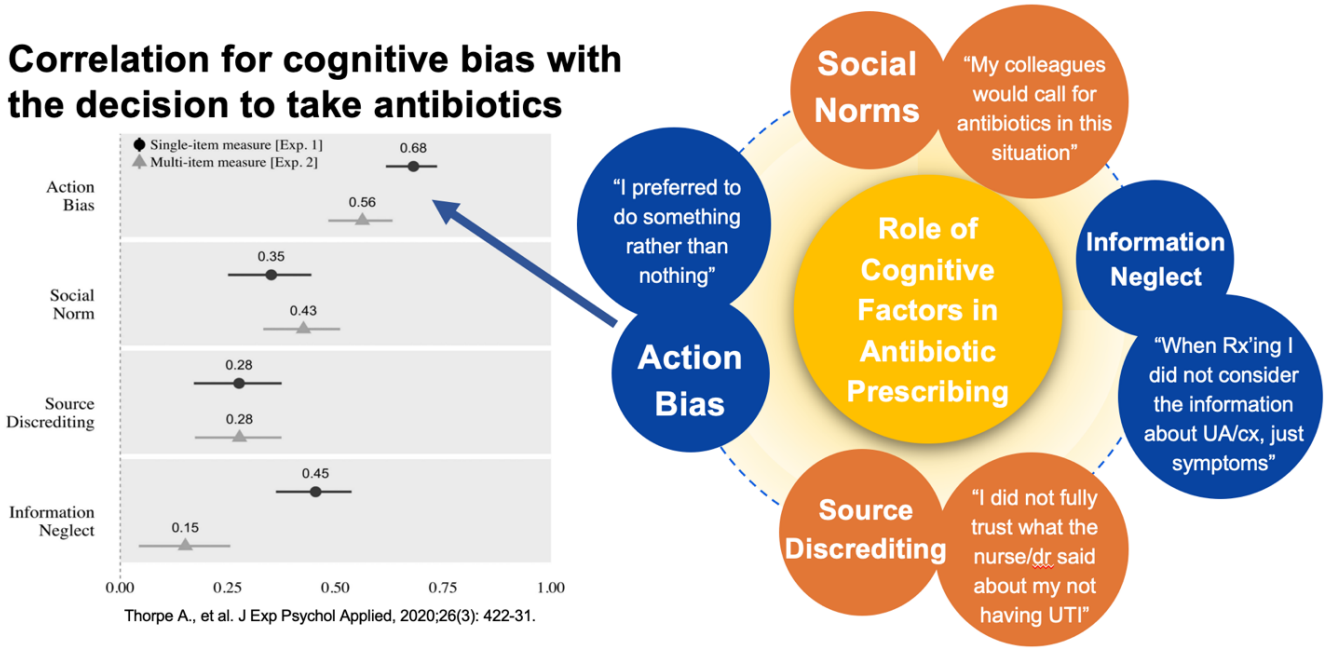
Guidelines

Condition	Preferred	Alternative	
Urinary Tract Infection			
Uncomplicated UTI	Nitrofurantoin x 5 days	Bactrim x 3 days	Cephalexin x 3-7 days Cefpodoxime Cefuroxime Cefdinir
		Alt to above:	Levofloxacin x 3 days
Complicated UTI	Nitrofurantoin x 7 days	Bactrim x 7 days	Cephalexin x 7 days Cefpodoxime Cefuroxime Cefdinir
		Alt to above:	Levofloxacin x 7 days
Pyelonephritis	Cipro or Levoflox x 7 days	Bactrim x 7-14 days	Augmentin x 10-14 days
Asymptomatic Bacteriuria			
Pregnancy	Amoxicillin x 3-7 days Cephalexin x 3-7 days	Bactrim x 3-7 days	Nitrofurantoin x 3-7 days
Urologic Procedures	Cephalexin x 72h before Cefpodoxime Cefuroxime	Bactrim x 72h before	Ciprofloxacin or Levofloxacin 72h before
Multidrug-Resistant Organisms			
VRE	Amoxicillin 500 -1000 mg TID to BID • urine drug exceeds MIC necessary for therapeutic effect	Daptomycin x 3-7 days	Linezolid x 3-7 days
ESBL	Fosfomycin 3g q72h x 1-3 days • not for pyelonephritis	Ertapenem x 3-7 days	Tobramycin 5 mg/kg x1 dose

Sources:
Gupta K., et al. CID 2011; 52(5):e103-120
Tamma P., et al. CID 2023;ciad:428; e1-53.
Nicolle L., et al. CID 2019;68(10):e83-75

Communication and Framing Messages

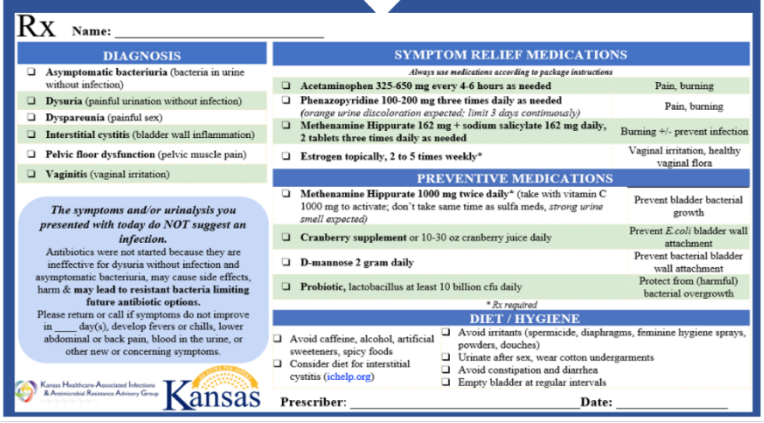
There are many cognitive factors influencing prescribing. The greatest factor in unnecessary antibiotic prescribing is action bias.[11] Clinicians have a bias to "do something". Reframe the message so that we are providing an action-item to the ordering prescriber, family or resident.



This GU decision support script can be printed on a notepad (5x7) or turned into a dot phrase to assist with alternative options for symptomatic treatment of non-infectious GU issues (e.g., pain or urgency related to interstitial cystitis, pelvic floor dysfunction). This tool also provides guidance on prevention of UTI.

Nurse-driven algorithms also assist in guiding when to order a UA or culture. This policy can be adapted to your facility.

Download & Print Decision Support Tools on Notepad as a "GU Prescription" (or turn into dotphrase)



Rx Name: _____

DIAGNOSIS

- ❑ **Asymptomatic bacteriuria** (bacteria in urine without infection)
- ❑ **Dysuria** (painful urination without infection)
- ❑ **Dyspareunia** (painful sex)
- ❑ **Interstitial cystitis** (bladder wall inflammation)
- ❑ **Pelvic floor dysfunction** (pelvic muscle pain)
- ❑ **Vaginitis** (vaginal irritation)

The symptoms and/or urinalysis you presented with today do NOT suggest an infection.

Antibiotics were not started because they are ineffective for dysuria without infection and asymptomatic bacteriuria, may cause side effects, harm & **may lead to resistant bacteria limiting future antibiotic options.**

Please return or call if symptoms do not improve in ____ day(s), develop fevers or chills, lower abdominal or back pain, blood in the urine, or other new or concerning symptoms.

Kansas Healthcare-Associated Infections & Antimicrobial Resistance Advisory Group — Kansas

SYMPTOM RELIEF MEDICATIONS

Always use medications according to package instructions

- ❑ **Acetaminophen 325-650 mg every 4-6 hours as needed** — Pain, burning
- ❑ **Phenazopyridine 100-200 mg three times daily as needed** *(orange urine discoloration expected; limit 3 days continuously)* — Pain, burning
- ❑ **Methenamine Hippurate 162 mg + sodium salicylate 162 mg daily, 2 tablets three times daily as needed** — Burning +/- prevent infection
- ❑ **Estrogen topically, 2 to 5 times weekly*** — Vaginal irritation, healthy vaginal flora

PREVENTIVE MEDICATIONS

- ❑ **Methenamine Hippurate 1000 mg twice daily*** (take with vitamin C 1000 mg to activate; don't take same time as sulfa meds, *strong urine smell expected*) — Prevent bladder bacterial growth
- ❑ **Cranberry supplement** or 10-30 oz cranberry juice daily — Prevent *E.coli* bladder wall attachment
- ❑ **D-mannose 2 gram daily** — Prevent bacterial bladder wall attachment
- ❑ **Probiotic,** lactobacillus at least 10 billion cfu daily — Protect from (harmful) bacterial overgrowth

** Rx required*

DIET / HYGIENE

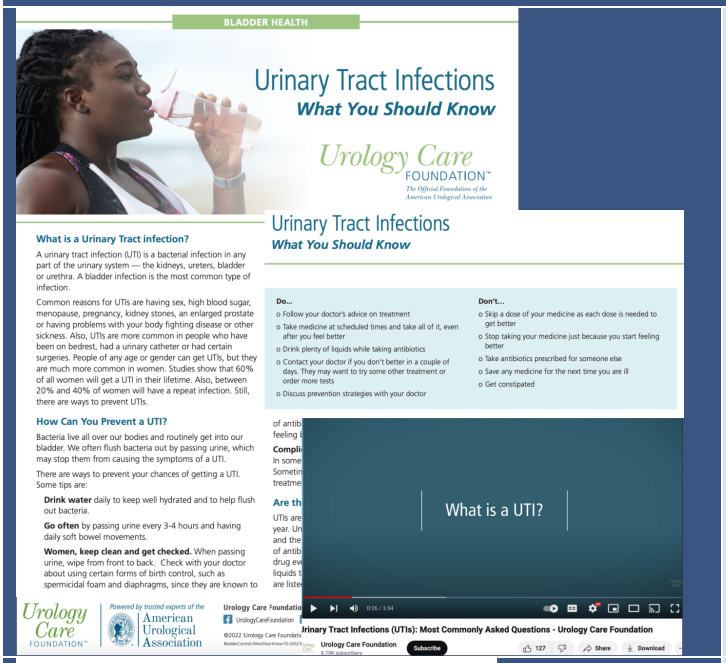
- ❑ Avoid caffeine, alcohol, artificial sweeteners, spicy foods
- ❑ Consider diet for interstitial cystitis (ichelp.org)
- ❑ Avoid irritants (spermicide, diaphragms, feminine hygiene sprays, powders, douches)
- ❑ Urinate after sex, wear cotton undergarments
- ❑ Avoid constipation and diarrhea
- ❑ Empty bladder at regular intervals

Prescriber: _____ Date: _____

Patient Educational Resources for UTI

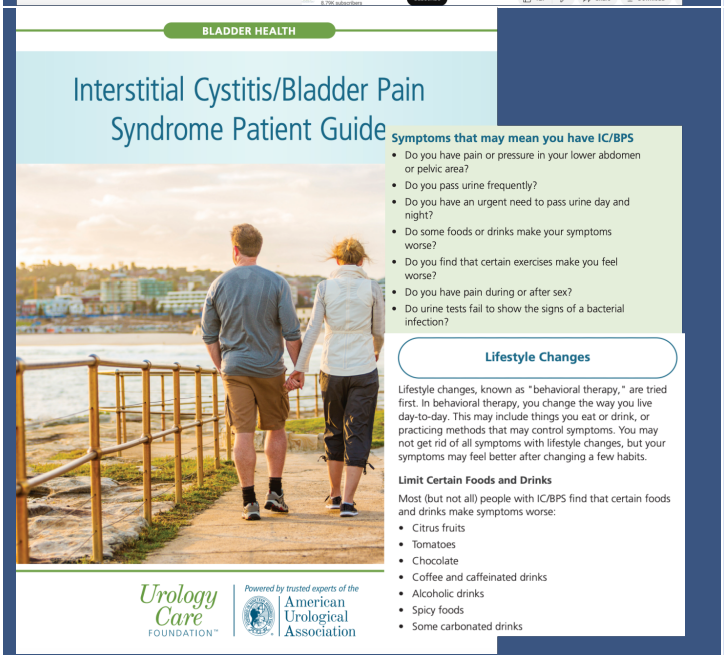
The American Urologic Association has created great resources for patients to understand the symptoms of UTIs, how to prevent them, and information of mimics (interstitial cystitis).

Patient Education Library



Ask patients to keep a diary for 2-3 days to better understand the UI trigger, symptoms in order to better control it.

- UTI prevention info
- Q&A video
- Recurrent UTI podcast



Interstitial cystitis and chronic bladder pain affect many people, these symptoms mimic UTI (pain, burning, urgency, frequency) but are not caused by infection.

- Interstitial cystitis and bladder pain syndrome guide

Implementing a UTI Program

Find your UTI "champion" and core group of staff, including a prescriber, the director of nursing (DON), and nursing staff. Start with 1 or 2 residential units or clinic pods, assess for success and then spread what works to other units and re-evaluate what isn't working.

Step 1: Assess and Assemble

What do we need to change and are ready to make changes?

First, determine if your facility even needs a UTI initiative. If your facility has low rates of inappropriate UA or culturing, doesn't rely on dipsticks for diagnosis, or has low rates of UTIs, CAUTIs and inappropriate antibiotic use – then you may not want to divest precious resources to this initiative. Once you've determined your facility would benefit from improved UTI practice changes, assess for readiness to change, assemble a team and examine barriers.

Set aside 1-2 months to assess your facilities readiness and assemble the team and assign roles.

- ○ Assess the **current state** of culturing or prescribing; the following are options you can use to tract UTIs, CAUTIs or urine culturing and antibiotic utilization (note: don't track everything – instead determine which metric is best for your facility and needs)

Data
CAUTI rates: _____ (# UTIs) / ___ (# catheter days) x 1000 = ___ CAUTI/1000 resident days
UTI rates = _____ (# UTIs) / _____ (# resident days) x 1000 = _____ UTI/1000 resident days
UTI rates = _____ (# UTIs) / _____ (1000 urine samples) = _____ UTI/1000 urine samples
Urinalysis that are sent to lab each month (lab should provide report): _____
Urine cultures sent to lab each month (lab should provide a report): _____
Antibiotic rates: _____ (number of UTI abx starts) / _____ (resident days) x 1000 _____ = abx starts per 1000 resident days
Antibiotic duration of above abx starts (contracting pharmacy may provide reports): _____
While all of the above data are helpful, you may want to start with only one of the data sources

- ☐ Review the data above. What is your impression? Are they high for your facility? If yes, then the UTI initiative may be appropriate.
- ☐ University of WI provides a Urine Culture Tracking Spreadsheet as a way to track and review urine testing indications
- ☐ HAI tracking spreadsheet allows for tracking of CAUTI, catheter days.

○ Assess the need to **change** practices:

Practice Change Questionnaire	
In our facility, we obtain urine cultures only when patients or residents have symptoms of UTI	❑ Yes ❑ No
Urine cultures are obtained and stored correctly (i.e., clean-catch or mid-stream, and sent to lab immediately or stored in refrigerator)	❑ Yes ❑ No
Antibiotics are prescribed only when specified criteria have been met and residents are reassessed once culture and susceptibility results have been received	❑ Yes ❑ No
The following activities are not recommended. Determine if your facility is performing these activities	
Use of dipsticks to diagnose a UTI	❑ Yes ❑ No
Our facility obtains routine annual urine screening, and/or screening UAs on admission in patients/residents who do not have signs/symptoms of a UTI	❑ Yes ❑ No
Adapted from Public Health Ontario UTI Implementation Program Toolkit	

○ Assess your facility's **readiness** to implement changes:

Consideration for Readiness	
Planning and rollout conflict with other significant changes underway (e.g., significant staff or IP changes, another program rollout)	❑ Yes ❑ No
Which stakeholders or team members should be consulted for support in moving forward with the program (e.g., medical director, director of nursing, infection preventionist, stewardship):	
_____ _____	
_____ _____	
Corporate LTCs should consult with the corporate representative about plans to implement a UTI program, and encourage involvement in the implementation team	
Is there a designated lead for the initiative and their time can be committed to this project	❑ Yes ❑ No
Identify all staff that are directly involved in clinical decision making and orient them to this opportunity (e.g., physicians, APPs, RN, LPNs, nursing aids)	❑ Yes ❑ No
Adapted from Public Health Ontario UTI Implementation Program Toolkit	❑

- **Assemble the team,** looking for action people (individuals who enthusiastically participate in challenges and opportunities) and are trusted in the facility.
    - Not all staff need to be at all assessing and planning meetings, but it may be more efficient to have the larger group - including prescribers and administrative leaders - at the initiative start (for logistics, feedback and buy-in)
    - Involve local influencers in the team (those perceived as influential in the facility)

Team Assembly

Identify the initiative champion(s)

_____ _____

Identify team members, attempting to identify members from as many key groups as possible (e.g., prescribers, front-line staff, RNs, LPNs, nursing aids, IP, stewardship lead)

_____ _____

_____ _____

It is not necessary to include all key representatives, but ensure they are aware when we move into the buy-in phase (step 2)

Identify the influencers and opinion leaders (peers or staff who are perceived as trustworthy, credible and knowledgeable)

_____ _____

_____ _____

It is not necessary to include all influencers, but ensure they are aware when we move into the buy-in phase (step 2)

Outline the roles and responsibilities of the implementation team, for example:

- ☐ the team will review this guide.
- ☐ the team will complete an initial assessment phase.
- ☐ the team will outline the plan for how strategies support staff.
- ☐ the team meets twice monthly to assess how things are progressing)
- ☐ Other: _____

Outline the roles, processes, and responsibilities for implementation team members, for example:

- ☐ All members: review this toolkit.
- ☐ Champion/lead: set up 1 planning meeting per month with implementation team.
- ☐ Champion/lead: set up meetings with stakeholders (based on buy-in worksheet)
- ☐ Champion/lead: present baseline data to frontline providers and nursing staff
- ☐ Champion/lead: deliver education to staff incorporating facility UTI or abx data.
- ☐ Member #1: review and complete barriers to practice change.
- ☐ Member #1: collect data (see current state assessment above for metrics)
- ☐ Member #3: review current policies and procedures (UTI and/or catheter-related) to ensure up to date and in alignment with best practices.
- ☐ Member #3: update policies to ensure in alignment with best practices and UTI program.
- ☐ Data collection: Member #1/2/3: see metrics in assessment above split up data collection amongst all members.

Adapted from Public Health Ontario UTI Implementation Program Toolkit

Step 2: Plan

What do we need to change and are ready to make changes?

A critical key to success is good planning at the start. A well thought out plan will contribute to the program's implementation success and sustain the program over time.

The implementation phase should account for 2 months.

- ○ **Plan: develop the plan to support the changes**
  - ☐ Examine **barriers** to practice change:

Barriers to Practice Change	
Organization barriers	
Policies impact inappropriate UA/culturing *(e.g., policy for annual UA, standing UA after foley placement, standing UA on admit for those with catheters)*	☐ Yes ☐ No
Lack of policy or procedures with sufficient detail on UTI assessment and management	☐ Yes ☐ No
Lack of diagnostic algorithm or treatment guidelines result in diverse prescribing practices, or they are out of date	☐ Yes ☐ No
Due to staff turnover, new staff are not educated on UTI/CAUTI or UTI initiatives	☐ Yes ☐ No
There is poor communication among care teams (verbal and/or documented) as to why a UA or culture is ordered	☐ Yes ☐ No
There is a formal process of how resident symptoms are documented and communicated. *(e.g. SBAR tool for suspected UTI policy and surveillance form for tracking)*	☐ Yes ☐ No
There is a lack of support from the director/administrator/leadership for making a change	☐ Yes ☐ No
Front-line staff or physicians will not accept new/updated recommendations	☐ Yes ☐ No
Skills barrier	
Staff lack the skill to support UTI surveillance including data collection, management, and analysis:	☐ Yes ☐ No If yes, which types: ❑ Tools for surveillance ❑ How to develop tools to survey ❑ How to perform daily surveillance ❑ How to compile and analyze data

Knowledge Barriers	
Staff lack knowledge and skills for UTI assessment. *e.g., symptoms of UTI/CAUT vs ASB, when to obtain a UA/culture, proper urine sampling and collection techniques ([i.e., midstream or clean-catch, via foley collection port or fresh catheter rather than catheter or bag sampling), urine storage/lab collection ([i.e., not left out refrigerated immediately if not able to be processed at lab)*	☐ Yes ☐ No If yes, which staff: ❑ Physicians ❑ APPs ❑ IPs ❑ RNs ❑ LPNs ❑ Nursing aids ❑ Personal care aids
Resident or family pressures frequently result in unnecessary specimen collections	☐ Yes ☐ No
Resident or family pressures frequently result in unnecessary treatment with antibiotics	❑ Yes ❑ No
Inadequate staffing time to provide education to residents or families	❑ Yes ❑ No
Adapted from Public Health Ontario UTI Program: Barriers to Practice Change	

Barriers are key in making or breaking the initiative. If knowledge is the key barrier, this will be a key target of the action plan. If resident or family pressures to be tested when asymptomatic or receive unnecessary antibiotics, this is a key strategy in developing the implementation plan.

- ○ **Generate buy-in:** LTCFs need ensure administration and leadership are on board with the UTI program otherwise the initiative will fail and be unsustainable. Likewise, frontline clinicians must also be aware of the problem and if not, it is the responsibility of the champion to relay the identified problems to relevant staff, leadership, residents, and family.
  - ☐ The following questionnaire will identify and brainstorm avenues to discuss the need for the program with leadership, medical and nursing directors, and staff.
  - ☐ Bring the initiative to them identified teams with the goal of engaging them and creating a dialogue around solutions. Keep in mind that people feel more engaged when they are part of the solution rather than being told they will adhere to the program or having a decision imposed on them.
  - ☐ Front-line staff are more comfortable supporting practice changes when they are backed by written policies and procedures. Assign a member to review existing policies and procedures and ensure they are up to date and in alignment with current best practice recommendations.

Strategy to Achieve Buy-in

Organization barriers	
The facility has problems with unnecessary UA and/or culturing.	☐ Yes ☐ No If yes, which groups are **unfamiliar** with the issue: ☐ Leadership and administration

	☐ Medical director ☐ Director of Nursing ☐ Prescribers ☐ Nursing staff ☐ Infection prevention
The facility has problems with unnecessary antibiotics for ASB, unnecessarily long durations or off-guideline antibiotic regimens	☐ Yes ☐ No If yes, which groups are **unfamiliar** with the issue: ☐ Leadership and administration ☐ Medical director ☐ Director of Nursing ☐ Prescribers ☐ Nursing staff ☐ Infection prevention
The following groups are **aware of the harms** of unnecessary antibiotics	☐ Leadership and administration ☐ Medical director ☐ Director of Nursing ☐ Prescribers ☐ Nursing staff ☐ Infection prevention
Frontline staff or physicians are aware or involved in the creation of new/updated UTI testing and treatment guidelines	☐ Yes ☐ No ☐ N/A
Which existing meetings or events can we use to address the problem of antibiotic-related harms	_____ _____
Which member(s) will identify the groups that need to be involved in creating buy-in?	_____ _____
Which member(s) will bring the issue to these groups, and which issue(s) are to be addressed?	_____ _____
Which existing organization policies and/or procedures should be reviewed to identify any inconsistencies with current practice recommendations for UTI assessment and management?	_____ _____
Which member(s) will review the policies and procedures, and make any changes that are perceived to not be in alignment with best practices?	_____ _____
Adapted from Public Health Ontario UTI Implementation Program Toolkit	

Step 3: Implement

Roll out the strategies and action plan.

Plan: develop an action plan to support the changes

- ☐ Roll out strategies based on what you found in the data review:
  - **If you found excessive CAUTIs,** target catheter utilization initiatives discussed in the catheter section.
  - **If you identified excess UA or culturing trends** – consider interventions discussed in urine stewardship and education directed in the asymptomatic bacteriuria UTI and diagnosis sections above.
  - **If you identified guideline discordant antibiotic prescribing** – consider the initiatives discussed in the treatment section with clinician, nursing and pharmacist education focused on the communication section.
- ☐ Ensure the plan for each strategy above has been addressed (e.g., barriers reviewed and groups informed/engaged, strategies to achieve buy-in)
- ☐ Obtain front-line staff and prescribers feedback on the intended strategies and tools created or revised.
- ☐ Determine the frequency of implementation team meetings.
- ☐ Review surveillance data (monthly or every other month)
- ☐ Revise whether adjustments to the action plan are indicated based on feedback.
- ☐ Ensure residents and families concerns are addressed and incorporate education.

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