



HealthLine

Focus on Catheter-Associated Urinary Tract Infections: Part 1

- by Allen Lefkowitz

Urinary tract infections (UTI) represent up to 40% of all healthcare-associated infections (HAI) and are the most common infection type in long-term care (LTC). Past estimates were that “suspected UTI” accounted for up to 60% of antibiotic prescriptions in LTC. An estimated 70% of healthcare-associated UTI are associated with urinary catheters, and this rate increases to nearly 95% within hospital intensive care units (ICU). However, up to 70% of catheter-associated urinary tract infections (CAUTI) are considered to be **avoidable, provided recommended infection-prevention practices are implemented**. This also can be seen in the following description of CAUTI from the Centers for Disease Control and Prevention (CDC): “When a urinary catheter is not put in correctly, not kept clean, or left in a patient for too long, germs can travel through the catheter and infect the bladder and kidneys.”

In 2013 the US Department of Health and Human Services approved their “road map” to reduce HAI in nursing homes, with particular emphasis on reducing indwelling catheter use and CAUTI. This focus article will provide background information on the topic of CAUTI as well as identifying risk factors and strategies to prevent CAUTI. Next month’s issue will focus on identification of CAUTI, appropriate treatment, and other LTC implications.

Background Information on CAUTI

Up to 25% of all hospital inpatients have a short-term, indwelling urinary catheter inserted during their stay. While 12-15% of those newly admitted to a LTC facility have an indwelling catheter, data through 4th quarter 2016 show that only 2.4% of long-stay residents had a urinary catheter (compared to older data that suggested 5-8% of LTC residents). In addition to the risk of CAUTI, compared to patients without a catheter, catheterized patients are forty times more likely to develop bacteremia.

CAUTI is also a priority to understand as it “was the first hospital-acquired complication chosen by the Centers for Medicare and Medicaid Services (CMS) in 2008 as the basis for denial of additional payment to hospitals.” CMS’ goal was to reduce CAUTI by 25% between 2009 and 2013; however, the incidence surprisingly increased by 6% during that time period. According to the most recent data in the *National and State Healthcare-Associated Infections Progress Report* from the CDC, between 2013 and 2014 the rate for CAUTI:

- ↓ 11% in long-term acute care hospitals (LTACH)
- ↓ 14% in inpatient rehabilitation facilities (IRFs)
- ↓ 5% in acute care hospitals (ACH)

Continued on next page

Inside This Issue

1-3 Focus on CAUTI

4 Hazardous Drugs in LTC

5 Clinical Capsule: Anti-Infectives
Commonly Associated with
Photosensitivity Reactions

6 New Drug Ingrezza™

6 New Generic Medications

7 HealthLine Quiz

While recent data appeared to show improvement, this report indicated that overall there was “no change” in the rate of CAUTI between 2009 and 2014, and that areas of improvement were primarily outside of the hospital intensive care units (ICU).

Risk Factors for CAUTI

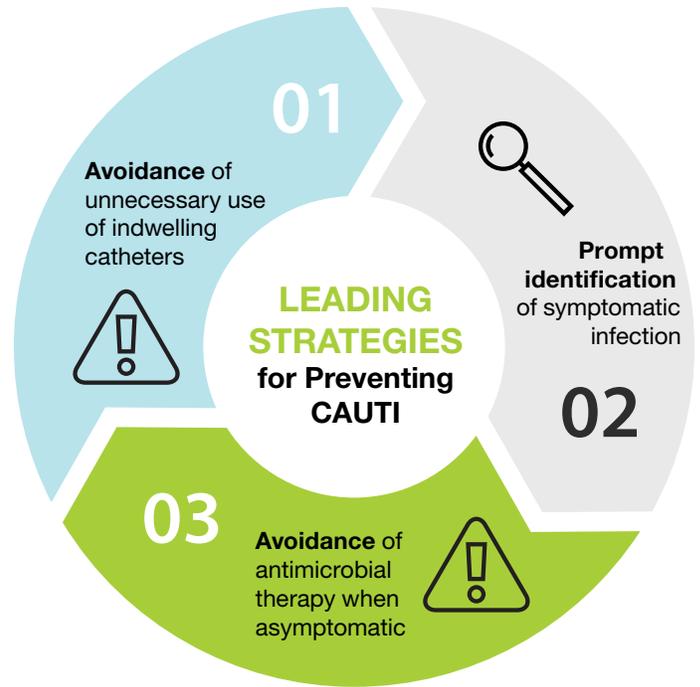
Beyond the obvious presence of an indwelling catheter, other risk factors for CAUTI are outlined below.

Potentially Modifiable Risk Factors for CAUTI
Duration of catheterization
Nonadherence to aseptic catheter care
Inadequate training for personnel who insert catheters
Catheter insertion outside of an operating room
Recent hospitalization
Non-Modifiable Risk Factors for CAUTI
Female gender
Residing in a LTC facility
Severe underlying illness/functional disability
Age >50 years
Diabetes
Renal insufficiency

As elimination of catheters can result in fewer complications (e.g., fewer UTI, fewer pressure ulcers), addressing the modifiable risk factors listed above can have a significant impact on the use of unnecessary antibiotics and the side effects associated with their use. Other potential benefits of catheter elimination include reduced costs, quicker mobility, and earlier discharge.

Prevention of CAUTI

CAUTI are considered the most preventable type of HAI when strict infection control practices are followed. The Association for Professionals in Infection Control (APIC), states that efforts to prevent CAUTI “have a major impact” on both preventing HAI and promoting antimicrobial stewardship efforts. Likewise, prevention of CAUTI represents one of three focuses that CDC recognizes as “an important strategy for reducing the impact of AR [antibiotic resistant] bacteria on human health”. The three leading strategies for preventing CAUTI are depicted in the graphic at top of next column.



As suggested by the first leading strategy, an awareness of potentially appropriate and inappropriate indications for urinary catheters is critical. Up to 50% of individuals with a urinary catheter are considered to **not** meet the appropriate use criteria. Potentially appropriate indications for urinary catheters include:

- Acute urinary retention or obstruction
- Perioperative use in selected surgeries
- Assistance in healing of stage III or IV perineal or sacral wounds in incontinent patients
- Hospice/comfort care/palliative care
- Required strict immobilization due to trauma/surgery
- Accurate and acute measurement of urinary output in critically ill patients (e.g., in ICU)

Inappropriate reasons for urinary catheters include:

- Urine output monitoring outside of the ICU
- Urinary incontinence when patient has intact skin and can be turned/provided skin care
- Morbid obesity (when functional status does not limit ambulation)
- To reduce falls caused by the need to get up to urinate
- Immobility without a sacral or perineal pressure sore
- Confusion or dementia
- Patient/family request

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More information on the remaining two leading strategies will be addressed in next month's focus article, but these three strategies are not the only considerations in preventing CAUTI. Various mnemonics have been developed to assist in remembering these strategies, but two of the more common are shown below.

A	Adherence to infection control principles (e.g., hand hygiene, aseptic insertion techniques)
B	Bladder ultrasound (e.g., use of a portable bladder scan)
C	Condom catheters or other alternatives (e.g., intermittent catheterization) instead of indwelling catheters
D	Do not use an indwelling catheter unless you must
E	Early removal of the catheter subsequent to ongoing re-evaluation of need
C	Catheter free – assess for necessity and remove if no appropriate indication
A	Aseptic insertion of indwelling catheters with hand hygiene before and after every resident contact and barrier precautions (gloves and gowns) during assistance with toileting or bathing
U	Use of catheters only if indicated; use alternative methods (e.g., intermittent, bladder scan) when possible
T	Training of staff and family about care (e.g., keep drainage bag below the bladder, no violations of a “closed” drainage system, managing tubing “kinks”)
I	Incontinence care planning to address individual resident challenges (e.g., timed and prompted voiding, appropriate medical management)

Additional strategies not included in these mnemonics include:

- Routine educational efforts to raise awareness and improve practice skills of anyone who inserts or manages catheters
- Providing enough portable commodes and/or bedpans throughout the facility to accommodate frequent toileting needs
- Increasing the supply of linens and skin protectant products on-hand to address increased incontinent episodes
- Designating “champions” throughout the multidisciplinary team who evaluate appropriate use and removal of catheters

Other strategies that have NOT been determined as beneficial and are NOT found in general guidelines include:

- Utilization of routine bladder irrigation (e.g., normal saline, acetic acid)
- Use of coated catheters (especially with chronic indwelling catheters)
- Providing antimicrobial prophylaxis while the catheter is needed and/or at the time of catheter removal

Federal actions and public reporting in recent years have led to increased awareness of CAUTI and provide multiple opportunities for LTC facilities to address this topic as one part of their established antimicrobial stewardship program.

Although specifically designed for hospitals, the Agency for Healthcare Research and Quality (AHRQ) developed a “Toolkit for Reducing Catheter-Associated Urinary Tract Infections in Hospital Units”. The implementation guide and more than a dozen other tools related to CAUTI are available at: <https://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/toolkit-impl.html>.



Hazardous Drugs in the Long-Term Care Setting

- by Carrie Allen

As Baby Boomers enter long-term care (LTC) facilities, the exposure of healthcare workers (HCW) in these settings to hazardous drugs (HD) is likely to increase. Many oncology patients are treated in an outpatient setting, and may return to a LTC facility between treatments. Additionally, new chemotherapy products are increasingly available in oral dosage forms, making the treatment of elderly cancer patients in a LTC setting more commonplace. This means that oral chemotherapy and other HD are more prevalent and HCW will be exposed to them more often. The National Institute for Occupational Safety and Health (NIOSH) estimates that eight million HCW are exposed to HD or HD waste, and that workplace exposure continues to be a problem, even with several organizations publishing safe handling guidance. Studies have shown that exposure to HD can occur from failure to use personal protective equipment (PPE), environmental contamination, contamination of containers transporting HD, patient urine, stool, emesis, and sweat. Exposure potential is related to the manipulations required to prepare and administer HD, the type of equipment available in the setting, and the PPE used (or not used) by personnel.

Guidance for safe handling of HD by HCW has been present for years, but compliance with safe-handling procedures including PPE use has been inconsistent. Following the publication of the United States Pharmacopoeia (USP) General Chapter <800> Hazardous Drugs - Handling in Healthcare Settings, the standards for HD handling procedures have become enforceable across all health care-provider settings. LTC facilities are obligated to protect HCW according to the new standards. While the Occupational Safety and Health Administration (OSHA) exempts a drug “when it is in solid, final form for direct administration to the patient”, when solid dosage forms are altered (e.g., crushed), they are subject to the HD handling standards. Additionally, a Health and Safety Practices Survey of HCW showed that 20% of nursing personnel who handled solid dosage forms always or sometimes crushed tablets or opened capsules. USP Chapter <800> requires personnel to wear PPE and use the appropriate engineering controls to avoid dispersing dust when they manipulate solid dosage forms.



HD include cancer chemotherapy, antivirals, hormones, some bioengineered drugs, and others with safe-handling guidelines from the manufacturer (e.g., some immunosuppressants). HD are defined by NIOSH as those that can cause at least one of the following in humans or animals:

- Carcinogenicity
- Teratogenicity or other developmental toxicity
- Reproductive toxicity
- Organ toxicity at low doses
- Genotoxicity

LTC employers should perform risk assessments to determine which precautions are required. NIOSH recommends that each organization create its own list of drugs considered to be hazardous, based on their formulary, or what is typically used at the facility. However, individual organizations may not have adequate resources for determining their own list; for that reason, NIOSH has an extensive list of hazardous drugs that are available at: www.cdc.gov/niosh/docs/2016-161/pdfs/2016-161.pdf

Facilities can use this list, but should be cautioned that such lists become outdated quickly. A routine review of the list is necessary to help maintain an updated list.

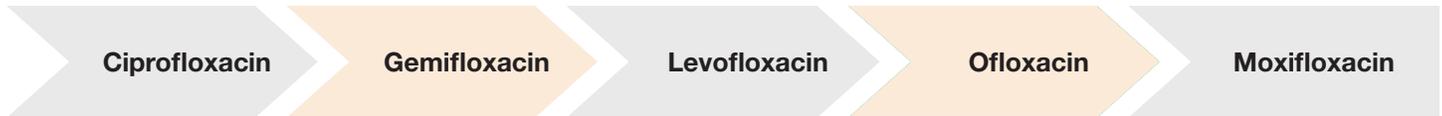


Anti-Infectives Commonly Associated with Photosensitivity Reactions*

- by Allen Lefkowitz

When individuals receiving certain medications are exposed to sunlight, drug-induced photosensitivity reactions may occur. The exposure to sunlight can result in damage to the skin cells (i.e., phototoxicity) similar to a sunburn, or may even produce an allergic response resembling eczema (i.e., photoallergy). Prior to sun exposure, sunscreen and protective clothing are imperative. Most reactions resolve with avoidance of sun and discontinuation of the offending medication. Anti-infectives are one of the classes most commonly associated with photosensitivity reactions.

Fluoroquinolones (with greater risk from left to right):



Tetracyclines (with greater risk from left to right):



Select 3rd Generation Cephalosporins Cefotaxime Ceftazidime	Select Antimalarials Quinine Quinidine
Sulfonamides Sulfamethoxazole Sulfasalazine	Antifungals Voriconazole Itraconazole Ketoconazole

*This is not an all-inclusive list of medications or anti-infectives that can contribute to photosensitivity reactions. For additional information on this topic, please refer to Omnicare's "Medications Associated with Photosensitivity Reactions" tool available at <https://omniview.omnicare.com/>.

Errata for June 2017 newsletter: Within the Clinical Capsule, the gabapentin row should have initially stated "Approved for PHN" as it is not FDA-approved for other types of neuropathic pain.

Within the New Drug section the Brand Name text for Tymlos injection mistakenly included information from the May newsletter instead of stating Tymlos (abaloparatide).

A revised version of the June 2017 newsletter with both corrections has been reposted.

I apologize for this oversight and any confusion this may have created.

Allen L. Lefkowitz PharmD, BCGP, FASCP – Senior Editor



Ingrezza™ Capsules

- by Dave Pregizer

Brand Name (Generic Name)	Ingrezza™ [in greh' zah] (valbenazine) [val BEN a zeen]
How Supplied	40 mg Capsules
Therapeutic Class	Vesicular monoamine transporter 2 (VMAT2) inhibitor
Approved Indication	Treatment of adults with tardive dyskinesia.
Usual Dosing	Starting dose: 40 mg once daily. After one week: 80 mg once daily (with or without food)
Select Drug Interactions	Avoid use with MAOI's (e.g., selegiline) due to risk of serotonin syndrome and/or increased Ingrezza effects; reduce dose with strong CYP3A4 inhibitors (e.g., clarithromycin) or strong CYP2D6 inhibitors (e.g., fluoxetine) due to increased Ingrezza concentrations; use with strong CYP3A4 inducers (e.g., phenytoin) is not recommended due to reduced effectiveness of Ingrezza; monitor closely with digoxin due to increased digoxin concentrations
Most Common Side Effects	Somnolence
Miscellaneous	With moderate or severe hepatic impairment, reduce to 40 mg once daily. May cause an increase in QT interval. Not recommended with severe renal impairment.
Website	http://ingrezza.com



NEW Generic Medications

Generic Name	Brand Name	Date Generic Available
Olopatadine 2 mg/mL Ophthalmic Solution	Pataday® Ophthalmic Drops	6/9/17
Atomoxetine 10 mg, 18 mg, 25 mg, 40 mg, 60 mg, 80 mg, and 100 mg Capsules	Strattera® Capsule	5/30/17

HealthLine Quiz

– by Steve Law

1. **Which statement is FALSE about catheter-associated urinary tract infections (CAUTI)?**
 - a. An estimated 70% of healthcare-associated UTI are associated with urinary catheters
 - b. The majority of CAUTI are considered to be avoidable provided recommended infection-prevention practices are implemented
 - c. A non-modifiable risk factor for CAUTI is diabetes
 - d. 25% of long-stay residents who reside in a nursing home have an indwelling catheter
2. **Which is an inappropriate reason for urinary catheters?**
 - a. Morbid obesity
 - b. Confusion or dementia
 - c. Patient/family request
 - d. Immobility without a sacral or perineal pressure sore
 - e. All of the above
3. **Antivirals are considered potentially hazardous drugs:**
 - a. True
 - b. False
4. **Which strategy is NOT considered beneficial to prevent CAUTI:**
 - a. Adherence to infection control principles
 - b. Utilization of routine bladder irrigation
 - c. Incontinence care planning
 - d. Increasing the supply of linens and skin protectant products on-hand to address increased incontinent episodes
5. **Which anti-infective agent would LEAST likely cause photosensitivity reactions?**
 - a. Ciprofloxacin
 - b. Bactrim DS
 - c. Clarithromycin
 - d. Tetracycline
6. **Which statement is FALSE about the new medication Ingrezza™ (valbenazine)?**
 - a. It is used to treat adults with tardive dyskinesia
 - b. The most common side effect is somnolence
 - c. It should be dosed at 40 mg once daily for patients with moderate or severe hepatic impairment
 - d. It may decrease digoxin concentrations

***Please note, the HealthLine Quiz is designed to help readers retain information that is relevant to their care setting. It is not an approved source of continuing education credits for healthcare professionals.**

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Answers to the HealthLine Quiz: 1) D 2) E 3) A 4) B 5) C 6) D