Summary of Recommendations of Published Guidelines on CAUTIs

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Adapted from:

Tenke, P., B. Kovacs, et al. (2008). "European and Asian guidelines on management and prevention of catheter-associated urinary tract infections." *Int J Antimicrob Agents* 31 Suppl 1: S68-78. PubMed

Conway, L. J. and E. L. Larson (2012). "Guidelines to prevent catheter-associated urinary tract infection: 1980 to 2010." *Heart Lung* 41(3): 271-283. PubMed

GENERAL MEASURES

► **Practice strict hand hygiene:** Hand washing and the use of disposable gloves when handling the catheter system are important factors in preventing CAUTIs as they prevent transmission of pathogens by contact and the fecal-oral route. Scientific evidence and ease of use support the use of routine hand rubbing with waterless, alcohol-based, rub-in cleansers.

► **Train all persons in catheter insertion and maintenance:** Care and cleansing of catheter connection sites, drainage spouts, and drainage bags.

► **Written protocols for catheter care:** Peri care daily and after episodes of bowel incontinence.

LIMITATION OF CATHETER USE

► **Evaluate necessity of catheterization:** Catheterize only when necessary and only for as long as necessary.

► **Review ongoing need for catheters regularly:** Identify catheters no longer necessary via daily review, standardized reminders, automatic stop orders, or nurse-directed protocols.

► **Evaluate alternative methods of drainage.**

CATHETER INSERTION

► **Use of aseptic technique/sterile equipment:** Mandatory clinical competencies of all skilled nursing staff concerning catheter insertion techniques.

► **Use of barrier precautions for insertion:** Maintain sterility when inserting catheters. Use an all-inclusive catheter tray.

CATHETER SELECTION

► **Use smallest bore catheter possible:** Size 14 Fr recommended. Large diameter catheters have higher UTI rates, resulting in greater leakage, and are more likely to obstruct normal urethral secretions. Use small balloon size (10 cc), as a larger balloon (30 cc) will increase the amount of undrained urine that pools below the level of the catheter lumen, thus increasing the risk of infection.

► **Use of silver alloy catheters:** Silver is an antiseptic that inhibits the growth of gram-positive and gram-negative bacteria, and silver-coated catheters may reduce urinary catheter-related bacteriuria and have a low risk for generating antibiotic resistance. May prevent CAUTI if IUC is used short-term.

► **Use of antimicrobial-impregnated catheters:** The outer wall and inner drainage lumen of these catheters are impregnated with an antibacterial agent (e.g., nitrofurazone), which exudes from the catheter over a period of days after insertion. It may prevent CAUTI if IUC is used short-term.

CATHETER MAINTENANCE

► **Maintain closed drainage system:** The cornerstone of infection control. Disconnection of the catheter and drainage bag is the leading cause of bacterial contamination. Connecting the catheter to an aseptic closed system (the catheter, bag, and tubing for a continuous unit) and maintaining the closed system assists in reducing infection. Consider a tamper-resistant catheter system product.

► **Replace collecting system if break in sepsis occurs:** CAUTIs develop between the catheter and urethra (extraluminal or periurethral). Bacteria can also travel within the catheter lumen (endoluminal) from the drainage tubing and inadvertently disconnect the catheter from the tubing.

► **Maintain drainage bag below level of bladder:** The optimal drainage system is a closed system with a 1-way valve between the bag and tubing. Maintain a free flow of urine in the catheter system. Hang bag on side of bed/chair to keep the drainage bag lower than the level of the bladder to prevent return of urine into the bladder.

► **Avoid routine irrigation:** Irrigation only used for blood clot removal following urology and genitourinary trauma. Catheter irrigation to "washout," prevent, or eradicate bacteria in indwelling catheters is ineffective, as more organisms gain entry to the irrigated catheters through disconnection of the system. Replace catheter and drainage system if catheter obstruction or leakage occurs.

DIAGNOSTICS AND ANTIMICROBIALS

► **Avoid routine urine cultures:** Only culture urine if signs and symptoms of an infection are present, which include 2 of the following symptoms:

- Fever (≥ 38 C) or chills
- New flank pain or suprapubic pain or tenderness
- Change in character of urine (bloody, foul smelling, etc.) OR lab report of new pyuria or microscopic hematuria
- Worsening of mental or functional status
- Local findings of obstruction, leakage, mucosal trauma, or hematuria
- Fever is the most frequent clinical presentation of UTI in the chronically catheterized resident
- Catheter obstruction is often a precipitating event for fever and systemic infection
- Fever with hematuria or catheter obstruction has a high probability of being from a urinary source

► **Avoid use of systemic antimicrobial prophylaxis:** Antimicrobial prophylaxis will not prevent bacteriuria or symptomatic infection.

► **Do not treat asymptomatic bacteriuria:** Bacteriuria (bacteria in the urine) usually occurs in most patients with a catheter in place for 2 to 10 days. A large number and a variety of types of organisms are present in the periurethral area and in the distal part of the urethra that may be introduced into the bladder at the time of catheter insertion. Catheter-associated bacteriuria is usually asymptomatic and uncomplicated, and it gradually resolves in an otherwise normal urinary tract after the catheter is removed. It is not treated.

ABBREVIATIONS

CDC, U.S. Centers for Disease Control and Prevention; EAU, European Association of Urology; HICPAC, Healthcare Infection Control Practices Advisory Committee; IDSA, Infectious Diseases Society of America; SHEA, Society for Healthcare Epidemiology of America; UAA, Urological Association of Asia; WOCN, Wound, Ostomy, and Continence Nurses Society

SUMMARY OF RECOMMENDATIONS OF PUBLISHED GUIDELINES ON CAUTIS

Recommendations	CDC (Wong, 1983)	EAU/UAA (Tenke, 2008)	SHEA (Lo, 2008)	IDSA (Hooten, 2009)	WOCN (Parker, 2009; Willson, 2009)	HIPAC (Gould, 2010)	Nursing Considerations
General Measures							
Practice strict hand hygiene	Y	Y	Y	ND	Y	Y	Hand washing and the use of disposable gloves when handling the catheter system are important factors in preventing CAUTIs as they prevent transmission of pathogens by contact and the fecal-oral route. Scientific evidence and ease of use support the use of routine hand rubbing with waterless, alcohol-based, rub-in cleansers.
Train all persons in catheter insertion and maintenance	Y	Y	Y	Y	Y	Y	Care and cleansing of catheter connection sites, drainage spouts, and drainage bags.
Written protocols for catheter care	ND	Y	Y	Y	Y	Y	Peri care daily and after episodes of bowel incontinence.

Limitation of catheter use							
Evaluate necessity of catheterization	Y	Y	Y	Y	Y	Y	Catheterize only when necessary and only for as long as necessary.
Review ongoing need for catheters regularly	Y	Y	Y	Y	Y	Y	Identify catheters no longer necessary via daily review, standardized reminders, automatic stop orders, or nurse-directed protocols.
Evaluate alternative methods of drainage	Y	U	Y	Y	Y	U	
Catheter insertion							
Use of aseptic technique/sterile equipment	Y	Y	Y	Y	Y	Y	Mandatory clinical competencies of all skilled nursing staff concerning catheter insertion techniques.
Use of barrier precautions for insertion	Y	U	Y	U	Y	U	Maintain sterility when inserting catheter. Use an all-inclusive catheter tray
Catheter selection							
Use smallest bore catheter possible	Y	Y	Y	U	Y	U	Size 14 F recommended. Large diameter catheters have higher UTI rates, resulting in greater leakage, and are more likely to obstruct normal urethral secretions. Use small balloon size (10 cc) as a larger balloon (30 cc) will increase the amount of undrained urine that pools below the level of the catheter lumen, thus increasing the risk of infection.
use of silver alloy catheters	ND	Y	N	Y	Y	Y	Silver is an antiseptic that inhibits the growth of gram-positive and gram-negative bacteria, and silver coated catheters may reduce urinary catheter-related bacteriuria and have a low risk for generating antibiotic resistance. May prevent CAUTI if IUC is used short-term.
Use of antimicrobial-impregnated catheters	ND	N	N	Y	Y	Y	The outer wall and inner drainage lumen of these catheters are impregnated with an antibacterial agent (e.g., nitrofurazone), which exudes from the catheter over a period of days after insertion. It may prevent CAUTI if IUC is used short-term.

Catheter Maintenance							
Maintain closed drainage system	Y	Y	Y	Y	Y	Y	Cornerstone of infection control. Disconnection of the catheter and drainage bag is the leading cause of bacterial contamination. Connecting the catheter to an aseptic closed system (the catheter, bag, and tubing for a continuous unit) and maintaining the closed system assists in reducing infection. Consider a tamper-resistant catheter system product.
Replace collecting system if break in sepsis occurs	Y	ND	U	ND	ND	ND	CAUTIs develop between the catheter and urethra (extraluminal or periurethral). Bacteria can also travel within the catheter lumen (endoluminal) from the drainage tubing and inadvertently disconnect the catheter from the tubing.
Maintain drainage bag below level of bladder	Y	Y	Y	Y	Y	Y	The optimal drainage system is a closed system with a 1-way valve between the bag and tubing. Maintain free flow of urine in the catheter system. Hang bag on side of bed/chair to keep the drainage bag lower than the level of the bladder to prevent return of urine into the bladder.
Avoid routine irrigation	Y	Y	Y	Y	Y	Y	Irrigation only used for blood clot removal following urology and genitourinary trauma. Catheter irrigation to "washout," prevent, or eradicate bacteria in indwelling catheters is ineffective, as more organisms gain entry to the irrigated catheters through disconnection of the system. Replace catheter and drainage system if catheter obstruction or leakage occurs.

Diagnostics and antimicrobials							
Avoid routine urine cultures	Y	Y	Y	Y	Y	Y	Only culture urine if signs and symptoms of an infection are present, which include 2 of the following symptoms: • Fever (≥ 38 C) or chills • New flank pain or suprapubic pain or tenderness • Change in character of urine (bloody, foul smelling, etc.) OR lab report of new pyuria or microscopic hematuria • Worsening of mental or functional status • Local findings of obstruction, leakage, mucosal trauma, or hematuria • Fever is the most frequent clinical presentation of UTI in the chronically catheterized resident. • Catheter obstruction is often a precipitating eheter obstruction has a high probability of being from a urinary source
Avoid use of systemic antimicrobial prophylaxis	ND	Y	Y	Y	ND	Y	Antimicrobial prophylaxis will not prevent bacteriuria or symptomatic infection.
Do not treat asymptomatic bacteriuria	ND	Y	Y	Y	Y	ND	Bacteriuria (bacteria in the urine) usually occurs in most patients with a catheter in place for 2-10 days. A large number and a variety of types of organisms are present in the periurethral area and in the distal part of the urethra that may be introduced into the bladder at the time of catheter insertion. Catheter-associated bacteriuria is usually asymptomatic and uncomplicated, and it gradually resolves in an otherwise normal urinary tract after the catheter is removed. It is not treated.

N: not recommended; ND: not discussed; U: unresolved (varies according to clinical experience and patient factors); Y: recommended

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