Student name: _____Janet Barylski_____

Points criteria:

Criteria	Under performance <3 points per criteria	Basic 3 – 3.9 points per criteria	Proficient 4.0 – 4.4 points per criteria	Distinguished 4.5 – 5 points per criteria
Required content objectives	Content objectives are missing or sparsely covered.	Content objectives are not consistently addressed. Demonstrates minimal understanding of content.	Content objectives consistently addressed. Demonstrates understanding of content.	Content objectives consistently addressed. Demonstrates mastery of content.
Academic writing standards	Writing lacks scholarly tone & focus. Sparse content. Multiple grammatical, spelling, & factual errors. Reliance on bullet points rather than effective writing in speaker notes. 4 or more direct quotes per project.	Writing is unclear and/or disorganized. Inconsistent scholarly tone. Inadequate depth of content. Grammatical and spelling errors. No more than 3 direct quote of less than 40 words per project.	Writing demonstrates general exploration of content. Responses are clearly written using scholarly tone. Few grammatical and/or spelling errors. No more than 2 direct quote of less than 40 words per project.	Writing demonstrates comprehensive exploration of content. Responses are clearly written using scholarly tone. Rare grammatical and/or spelling errors. No more than 1 direct quote of less than 40 words per project.
APA formatting	References and citations have multiple errors or are missing.	References and citations have errors.	References and citations have few errors.	References and citations have rare errors.

See course syllabus for reference requirements

Using academic writing standards and APA formatting of references and citations, respond to each of the following learning objectives. Using this document, enter your responses directly next to each objective listed below. Responses should be 150-350 words in length. Be sure to carefully review the assignment rubric on page one for specific details on how this assignment will be evaluated for points. Save the completed document as the assignment title with your name, and submit to the dropbox.

1. Describe the incidence and prevalence of catheter associated urinary tract infection (CAUTI).

   CAUTI represents approximately 9% of all hospital acquired infections, of which 65-70% are believed to be preventable (Van Decker, et al., 2021). CAUTI, a urinary tract infections (UTI) associated with indwelling urinary catheter (IUC) use, accounts for at least 80% of UTIs (Newman, 2022). CAUTI is classified as a complicated UTI due to the presence of a foreign body, the IUC. In the spring of 2013, Boston Medical Center (BMC) developed a CAUTI taskforce and began an initiative to decrease the occurrence of CAUTI in their ICU patients. This taskforce reviewed information from the CDC, the Institute for Healthcare Improvement, and the Healthcare Infection Control Practices Advisory Committee 2009 Guidelines. BMC used this information to develop a cycle of plan-do-study-act (PDSA) approaches to implement five care bundles over 5 years, addressing insertion/maintenance processes, indications for IUC use, appropriate testing for CAUTI, alternatives to IUC, and sterilization techniques. Their interventions resulted in an 83% decrease in CAUTI from 2013 through 2017, and a 33.8% reduction in IUC use during the last 24 months of the initiative, from 2015 through 2017 (Van Decker, et al., 2021). All of their interventions proved to contribute to favorable outcomes. However, the interventions with a clearly significant impact in reduction of CAUTI rates were awareness education, insertion and removal protocols, and the use of PureWick female incontinence devices. Another point of interest for CAUTI reduction is the use of Chlorhexidine (CHG). John's Hopkins conducted a QI project comparing the use of CHG wipes from naval to knee (NTK) twice daily and PRN following bowel movements to the use of soap and water twice daily for meatus and catheter cleaning. Their overall CAUTI rate decreased by 85% in nine months, with two units having no CAUTIs for six months following implementation of NTK CHG use (Schmudde, et al., 2023). Due to the association of CAUTI with increased morbidity, mortality, and cost, it is important to augment ways to decrease CAUTI occurrence.

2. List factors associated with the development of CAUTI.

   Prolonged IUC use is the main cause of CAUTI. The presence of a foreign body in the urinary system impedes the body's natural ability to destroy bacteria, predisposing the individual to UTIs that can progress to urosepsis and septicemia, possibly resulting in death. CAUTI is considered a "preventable harm" by the Centers for Medicare and Medicaid Services (CMS). The catheter itself is a risk factor for developing CAUTI, especially when in place for more than 6 days. Damage to the bladder and urethral mucosa during catheterization have also been associated with CAUTI. Female gender, catheter insertion outside of the operating room, urology procedures, diabetes, malnutrition, and azotemia are additional risk factors for the development of CAUTI. Bacteria can infiltrate the closed urinary catheter drainage system either extraluminally or intraluminally. Urinary stasis within the drainage tubing of the catheter system is an example of intraluminal bacteria entry. Bacteria on surrounding skin around the IUC can migrate up the urethral opening into the urinary tract and bladder during catheter manipulation or become introduced through the urethra during IUC insertion. These would be considered examples of extraluminal entry. Long-term catheterization greater than 30 days results in changes to the microbiologic environment of the urinary system causing copious amounts of biofilm formation. Biofilms are known to develop on the catheter within 15 minutes of

catheterization. Biofilms are comprised of bacteria, host cells, and cellular by-products that increase over time in conjunction with longer IUC insertion periods. Biofilms reduce the effects of antibiotics by becoming impenetrable to them and/or creating antibiotic resistance. IUC allow easier entry of pathogens that are resistant to antibiotic treatments resulting in a breeding ground for UTIs.

3. Discuss nursing evidence-based interventions for CAUTI prevention and management.

   In order to prevent inappropriate IUC use, nurses need to be aware of the 2009 guidelines developed by the CDC outlining appropriate IUC use. The best way to prevent CAUTI is avoiding IUC use. Reference the "ABCDE CAUTI Prevention Bundle:" A - adhere to infection control principles, standard supplies, procedures, and processes; B - bladder ultrasound protocol avoids unnecessary catheterization; C - catheter alternatives are intermittent catheterization, condom catheters, or absorbent products; D - do not insert IUC unless medically appropriate; E - early removal. Follow these evidence-based practices to reduce CAUTI when IUC is indicated: use aseptic insertion technique, secure the device to the abdomen or upper thigh, position the collection bag below the bladder but off the floor, prevent obstructions in urine flow by keeping the tubing patent and free from kinks, maintain adequate fluid intake, and replace the urinary collection system if any breaks in the closed drainage system occur. During urine collection and drainage, prevent the drainage spout from touching anything, and disinfect it before and after use. Use a separate clean collection container for each patient. Empty the collection bag if more than 400 mL full and before patient transport. Instruct transport staff to keep the collection bag below bladder level. Disinfect the collection port before and after urine collection, and use a sterile needless syringe/adaptor to aspirate the urine. Perform proper hand hygiene before and after coming in contact with catheter related devices. Wear gloves during contact with the patient and/or catheter system. Anchor the catheter system with some slack in the catheter to avoid taunt pressure on the periurethral area, avoid dislodgement, and decrease CAUTI. The ANA recommends performing perineal care at least daily, cleaning front to back to avoid bacterial cross contamination. Escherichia coli, Enterococcus spp., and Candida spp. are the most common pathogens associated with CAUTI (Newman, 2022). The antimicrobial properties of CHG 'baths' to the skin and catheter significantly reduce CAUTI. As nurses, we are always educators. Therefore, we should educate staff, patients, and caregivers who have a hand in catheter care on these interventions.

4. Identify selection criteria for appropriate indwelling catheter size.

   The size of the IUC indicates the outer diameter of the catheter. It is measured using the French scale (Fr). Appropriate catheter size selection is important. Inserting an IUC that is too large can cause erosion to the mucosa of the urethra and bladder neck, cause stricture

formation, and may lead to irritation and/or infection by impeding adequate drainage of secretions from the periurethral gland. The standard adult size IUC is 14 Fr. It is not recommended to routinely use large IUC, size 16 Fr and up. Smaller and larger IUC sizes may be indicated in non-routine situations. For example, a smaller IUC may be needed for urologic reasons. A larger IUC may be indicated to facilitate drainage is special situations such as an adult patient experiencing haematuria and/or blood clots. In this case, an 18-20 Fr IUC is commonly selected. If the adult has an obstruction, 20-24 Fr IUCs are commonly selected. An adult with prostatic bleeding would have a 30 Fr IUC with a 30 mL balloon inserted. Coude-tipped catheters may be more easily inserted in adult males with BPH. Age is another way to determine IUC size. Appropriate sizes based on age are as follows: premature infants, 5-6 Fr; newborn infants and toddlers weighing from up to 9 kg (19.8 lbs) to 10-30 kg (22-66 lbs), 5-8 Fr; school age children who are 11-12 years old, 8-10 Fr; and for adults age 13 years and older, 12-14 Fr for females and 14-16 Fr for males (Newman; 2022). When inflating the catheter balloon, inflate it to 10 mL. A 5 mL balloon will need to be filled with 10 mL of sterile water so the balloon inflates evenly. Inflation to 30 mL is almost the size of a chicken egg and weighs about 30g. This can render the bladder neck and sphincter irreparably incontinent and increase the risk for painful bladder spasms that may expel the catheter and/or result in leakage. In order to avoid adverse events, use due diligence when selecting IUCs.

5. Differentiate between a urinary tract infection and colonization.

   Colonization is asymptomatic, whereas a UTI is symptomatic. Colonization, also known as ASB (asymptomatic bacteriuria), is the asymptomatic presence of significant amounts of microbes, or in the case of this discussion, bacteriuria. Colonization develops in all patients with long-term IUC use, which is described as IUC inserted for 30 days or more. The risk for bacteriuria is 3-7% a day. At this rate, after one month, bacteriuria will be present in all long-term IUC patients. Hence, they will be colonized. Colonization is not treated aggressively and urine cultures are not necessarily performed unless the patient has symptoms of a urinary tract infection (UTI) (R.B. Turnbull Jr. MD School of Nursing Education, 2022). UTI is defined by Ermer-Seltun & Engberg on page 572 of the glossary as a bacterial infection or invasion of microbial uropathogens that can occur in the upper urinary tract system, the lower urinary tract system, or both. UTIs can be classified as pyelonephritis (upper UTI), cystitis or urethritis (lower UTI), simple/uncomplicated, complicated, and recurrent. UTIs are symptomatic, with the presentation of urgency, frequency and dysuria. UTI are evident by a combination of symptoms that present within 2 days of insertion or removal of IUC. Symptoms may include fever greater than 100.4F, suprapubic tenderness, costovertebral angle and/or flank pain/tenderness. The geriatric population may experience acute alteration in mental status, sudden onset of incontinence, or acute worsening of functional status. Geriatric populations are not likely to develop fevers, whereas the younger populations are likely to develop fevers. Pyuria in the presence of IUC is not a good indicator of UTI because it can occur as an inflammatory response to the presence of a foreign object, the IUC. UTI is evidenced by the clinical symptoms developed in response to the presence of pathogens, which differentiates UTI from the ASB/colonization.

References

Newman, D.K. (2022). In J.M. Ermer-Seltun & S. Engberg (Eds.), *Wound, Ostomy, and Continence Nurses Society core curriculum: Continence management* (2nd ed., pp. 405-432). Wolters Kluwer.

R. B. Turnbull, Jr. MD School of WOC Nursing Education. (2022, January 25). Urinary catheterization. [PowerPoint slides]. Vimeo@CCF.

Schmudde, Y., Olson-Sitki, K., Bond, J., & Chamberlain, J. (2023) *Implementation of Navel to Knees with Chlorhexidine Gluconate to Prevent Catheter Associated Urinary Tract Infections* [PowerPoint slides]. https://www.hopkinsmedicine.org/nursing/center-nursing-inquiry/_documents/shine-conference/podium-presentations/JHH_Podium_Klein.L_NTK.pdf

Streamlined Evidence-Based RN Tool: Catheter Associated Urinary Tract Infection (CAUTI) Prevention. (n.d.). https://www.nursingworld.org/~4aede8/globalassets/practiceandpolicy/innovation--evidence/clinical-practice-material/cauti-prevention-tool/anacautipreventiontool-final-19dec2014.pdf

Van Decker, S. G., Bosch, N., & Murphy, J. (2021). Catheter-associated urinary tract infection reduction in critical care units: a bundled care model. *BMJ Open Quality*, 10(4), e001534. https://doi.org/10.1136/bmjoq-2021-001534