

Using academic writing standards and APA formatting of references, respond to each of the following learning objectives. Using this document, **enter the responses directly next to the corresponding learning objective in the grid below.** Responses should be 150-350 words in length. Scroll down to see assignment rubric for specific details on how the project will be assessed and how the will be points awarded. Save the completed document as the assignment title with your name, and submit to the dropbox.

Learning Objective	Response
<p>1. Describe the incidence and prevalence of catheter associated urinary tract infection (CAUTI).</p>	<p>In the United States, indwelling urinary catheters are used relatively frequently. Estimates vary, but data indicate that 15% to 25% of hospitalized patients, 5% to 10% of long-term care residents, and 11% of home care patients will have an indwelling catheter at any given time (Wound, Ostomy and Continence Nurses Society™ [WOCN®], 2016). Considering that bacteriuria develops at a rate of 3% to 10% a day in catheterized individuals, and that 10% to 25% of those with bacteriuria develop symptoms of a catheter-associated urinary tract infection (CAUTI) (Fekete, 2020), prevalence of CAUTI is likely substantial. According to the National Healthcare Safety Network (NHSN), part of the Centers for Disease Control (CDC), CAUTI is the fifth most common healthcare-associated infection (HAI), representing more than 9.5% of HAIs in acute care settings (NHSN, 2021a).</p> <p>In 2012, CAUTI incidence for inpatient medical/surgical units in the United States was 1.4 to 1.7 cases per 1,000 catheter days (Fekete, 2020). A cross-sectional study conducted from 2012 to 2016 at a large academic health system revealed a CAUTI rate of 1.64 per 1,000 catheter-days. The same study found that about 12% of patients who had a catheter for 30 days would develop a CAUTI (Letica-Kriegel et. al., 2019). In 2015, an estimated 62,700 CAUTIs occurred in acute care facilities (NHSN, 2021a). In 2019, out of 3,678 acute care facilities reporting to the NHSN, there were 26,376 total CAUTIs. Of these, 12,115 occurred in ICUs and 14,261 occurred in wards (CDC, 2019).</p> <p>CAUTI rates for specific locations can be obtained from NHSN, but summary data is expressed using a measure called the standardized infection ratio (SIR) (NHSN, 2021a). It is calculated by dividing the number of observed CAUTIs by the predicted number. The predicted number is based on probabilities derived from regression analysis using 2015 data (NHSN, 2021b). The SIR adjusts for risk factors that affect incidence data, enabling more accurate comparison between facilities as well as to a national benchmark (NHSN, 2021b). The 2019 data for acute care facilities indicated an overall 8% decrease in CAUTIs from 2018, with the largest decrease (12%) occurring in ICUs (CDC, 2020).</p> <p>Globally, about 150 million people contract a CAUTI each year, according to Öztürk and Murk (2020). Hospital-acquired urinary tract infections (UTI) have a prevalence of 1.4% to 5.1%, with most of these related to catheter use. The rate is likely higher because mandatory reporting of CAUTIs is not required on a global scale (Öztürk & Murk, 2020).</p>

<p>2. List factors associated with the development of CAUTI.</p>	<p>Each day that a catheter remains in place carries a 3% to 7% increased risk of CAUTI (NHSN, 2021a). Therefore, the biggest modifiable risk factor for developing a CAUTI is prolonged use of the catheter. Other modifiable risk factors for CAUTI include meatal contamination, poor placement technique, the number of days before bacteriuria is detected, fecal incontinence, and breaks in the drainage system (WOCN[®], 2016). Although E. coli is the main pathogen involved in both CAUTI and uncomplicated UTI, the pathogen pool in CAUTI is much more diverse (Flores-Mireles et. al., 2019). E. coli is implicated in 75% to 85% of cases of uncomplicated UTI, in contrast to only 23.9% of cases of CAUTI. This diversity is likely due to opportunistic pathogens that proliferate due to changes in tissue and bladder environment caused by the presence of a catheter (Flores-Mireles et. al., 2019). This information reinforces the importance of removing a catheter as soon as possible or of not using one in the first place.</p> <p>Non-modifiable risk factors listed by WOCN[®] (2016) include female gender and older age. Immunosuppressants and antibiotics are also risk factors; those who have been on antibiotics within 3 days, immunosuppressants within 2 weeks, or corticosteroids within 7 days of catheter placement are at increased risk, as are those who have smoked within the last 5 years or who have a history of malignancy. Finally, diabetes mellitus, renal disease, or neutropenia increase the risk of CAUTI (WOCN[®], 2016).</p> <p>As part of the Centers for Medicare and Medicaid Services (CMS) Partnership for Patients initiative, the American Nurses Association (ANA), with significant input from WOCN[®], developed an evidence-based tool kit for indwelling urinary catheters (Lawrence, et. al., 2019). A copy of the ANA CAUTI prevention tool is included in WOCN[®] (2016) as Appendix F. The tool includes guidelines for determining appropriate use of indwelling urinary catheters.</p> <p>Appropriate uses include management of acute urinary retention or bladder outlet obstruction, accurate urine output measurement, short-term management following a surgical procedure, avoidance of contamination of a perineal or sacral wound, prolonged immobilization due to spinal or pelvic injury, and end-of-life comfort (Moore & Franklin, 2016; WOCN[®], 2016). Catheters should not be used to manage incontinence or to obtain a urine specimen in a patient who can void. Post-operatively, catheters should not be continued without justification, such as repair of urinary structures or epidural anesthesia (Moore & Franklin, 2016). Knowledge of appropriate use is essential to ensuring prompt removal and minimizing risk of CAUTI.</p>
<p>3. Discuss nursing evidence-based interventions for CAUTI prevention and</p>	<p>The best method for preventing CAUTI is to avoid catheterization unless indicated. If a catheter is placed, it should be removed as soon as possible. External catheters, intermittent catheterization, absorbent products, or toileting efforts should be used to manage incontinence (Moore & Franklin, 2016).</p> <p>Key evidence-based interventions listed in the ANA CAUTI prevention tool include strict hand hygiene and pericare before placing a catheter, strict aseptic technique during placement, and strict hand hygiene after placement. The catheter should be placed to an appropriate length (to the “Y” connection for males and 1 inch or 2.5 centimeters after obtaining urine flow for females). Urine flow should be checked before the balloon is inflated (WOCN[®], 2016). It is crucial to ensure that staff placing</p>

<p>management.</p>	<p>catheters are trained in proper technique and that their skills are validated.</p> <p>Once placement is complete, the tubing should be secured using an appropriate device that stabilizes the catheter. This avoids traction on the bladder neck and minimizes urethral irritation (Moore & Franklin, 2016; WOCN[®], 2016). The bag should be placed below the bladder but never on the floor. Kinking or dependent loops should be eliminated to prevent backflow. The entire system should be inspected to make sure that everything has remained closed (WOCN[®], 2016).</p> <p>Hand hygiene should be performed prior to giving catheter care. Daily care should include perineal hygiene using soap and water, including underneath the foreskin in uncircumcised males. There is no evidence to support use of antiseptic solutions such as povidone-iodine or chlorhexidine for daily cleansing; therefore, these are not recommended (WOCN[®], 2016). Wipes are preferred to bath basins, which can be a source of bacteria. The drainage bag should be emptied regularly using a clean container, keeping the spout from contact with another surface. If there are any breaks in the drainage system, the catheter should be replaced. Finally, nursing assistants and caregivers should be instructed in these evidence-based techniques (WOCN[®], 2016).</p> <p>Facilities that have adopted catheter care bundles have shown evidence of reduced CAUTI rates (Carter et. al., 2014, as cited in Moore & Franklin, 2016, p.240). These bundles consist of staff education regarding appropriate catheter use and placement skills, surveillance protocols to ensure appropriate use and prompt removal, and use of bladder scanners to assess for bladder emptying (WOCN[®], 2016).</p> <p>Of note, catheters coated with antimicrobials or silver alloy have been shown to reduce bacteriuria initially, but after one or two weeks are no more effective than uncoated catheters in this regard (Moore & Franklin, 2016).</p>
<p>4. Identify selection criteria for appropriate indwelling catheter size.</p>	<p>The ANA CAUTI prevention tool includes guidance for determining appropriate catheter size. Urinary catheters are sized according to their outer diameters using the French (Fr) scale of measurement. In this scale, 1 unit Fr equals 0.33 millimeter (mm) (Moore & Franklin, 2016). Therefore, a 14 Fr catheter has an outer diameter of 0.33 x 14, or 4.62 mm. The larger the number, the greater the outer diameter of the catheter.</p> <p>For indwelling urinary catheters, a 12 Fr to 14 Fr is indicated for adult (age greater than 13) females. For males, a 12 Fr to 16 Fr can be used (Moore & Franklin, 2016). In some individuals with clear urine and no debris or encrustations, a 10 Fr may be appropriate (WOCN[®], 2016). Special considerations may require a different size. For patients with urethral strictures, a 12 Fr to 14 Fr is indicated (WOCN[®], 2016). An 18 Fr is recommended for cases of hematuria, clots, or moderate to heavy debris and grit; a 20 Fr to 24 Fr if flushing is needed or for cases of obstruction or heavy hematuria; and a 30 Fr for cases of prostatic bleeding (Moore & Franklin, 2016; WOCN[®], 2016). For long-term catheterization (greater than 30 days), catheter size should not exceed 16 Fr due to risk of injury and urethral erosion (Moore & Franklin, 2016). A 12 Fr to 14 Fr is recommended for</p>

	<p>suprapubic catheters in adults (Geng et al., 2012, as cited in WOCN[®], 2016, p.12).</p> <p>For the pediatric population, a 5 Fr to 6 Fr is indicated for premature infants. For newborns weighing up to 9 kilograms (kg) and toddlers weighing 10 to 30 kg, a 5 Fr to 8 Fr is recommended. For school-age children up to 12 years of age, 8 Fr to 10 Fr is usually appropriate (Moore & Franklin, 2016).</p> <p>Bladder spasms and urethral erosion can result from larger catheters and balloons. These spasms are painful and can cause leakage and expulsion of the catheter (Moore & Franklin, 2016). Unless the provider orders differently, a balloon capacity of 5 to 10 milliliter (mL) is sufficient (WOCN[®], 2016). A larger balloon creates too much pressure on the bladder neck and sphincter due to its weight and can lead to permanent damage, especially in women (Moore & Franklin, 2016).</p>
<p>5. Differentiate between a urinary tract infection and colonization.</p>	<p>Moore and Franklin (2016) state that anyone with an indwelling urinary catheter will become colonized with microbes within a few days. This condition, called asymptomatic bacteriuria, does not cause symptoms and does not need to be treated. Pyuria and odor are common findings in those with catheters and do not necessarily indicate CAUTI. Pyuria results from the presence of a foreign body (the catheter) provoking an inflammatory response. Odor is caused by the presence of persistent bacteria in the urine (Moore & Franklin, 2016).</p> <p>The colonization process, described in Moore and Franklin (2016), begins with the formation of biofilm on the catheter surfaces. Individual microbes from the periurethral area or from the catheter tubing itself adhere to the internal and external catheter surfaces. Over time, these develop into an anchored colony that secretes a polymeric matrix, protecting the colony against antibiotics and the body's immune system. Biofilm development can occur as early as 24 hours following catheter placement. Microbes from the periurethral area or catheter tubing colonize the external and internal catheter surfaces and thereby enter the bladder. Colonization is estimated to proceed at 3% to 7% a day (Nicholle, 2014 as cited in Moore & Franklin, 2016). Studies focusing on prevention or elimination of biofilm on catheters have not revealed an effective intervention to date other than antimicrobial- and silver alloy-coated catheters, and these are effective only for a short period (Moore & Franklin, 2016).</p> <p>Progression of colonization to CAUTI produces several signs and symptoms. These can include fever and/or chills, suprapubic or flank pain, hematuria, and change in functional or cognitive status. A urine culture with greater than 10⁵ colony forming units (CFU) per mL is also indicative of CAUTI, as is a positive blood culture with organisms that match the urine culture. In spinal cord injury patients, symptoms can also include increased bladder spasms, autonomic dysreflexia, or a feeling of "unease" (Moore & Franklin, 2016).</p>
References	References

<p>See the course syllabus for specific requirements on references for all assignments.</p>	<p>Centers for Disease Control (CDC). (2019). 2019 national and state HAI progress report: acute care hospitals. https://www.cdc.gov/hai/excel/hai-progress-report/2019-SIR-ACH</p> <p>CDC. (2020, December 2). Current HAI Progress Report: 2019 National and State Healthcare-Associated Infections Progress Report. https://www.cdc.gov/hai/data/portal/progress-report.html#2018</p> <p>Fekete, T. (2020, March 5). Catheter-associated urinary tract infection in adults. https://www-uptodate-com.ccmmain.ohionet.org/contents/catheter-associated-urinary-tract-infection-inadults?search=CAUTI%20&source=search_result&selectedTitle=1~79&usage_type=default&display_rank=1</p> <p>Flores-Mireles, A., Hreha, T.N., and Hunstad, D.A. (2019). Pathophysiology, Treatment, and Prevention of Catheter-Associated Urinary Tract Infection. Topics in Spinal Cord Injury Rehabilitation, 25(3), 228-240. https://doi.org/10.1310/sci2503-228</p> <p>Lawrence, K.G., Bliss, D.Z., Dailey, M., Trevellini, C., & Pontieri-Lewis, V. (2019). The CAUTI prevention tool kit: a professional practice and collaborative project of the Wound, Ostomy and Continence Nurses Society. Journal of Wound, Ostomy, and Continence Nursing (46)2, 154-157. https://doi.org/10.1097/WON.0000000000000505</p> <p>Letica-Kriegel, A. S., Salmasian, H., Vawdrey, D. K., Youngerman, B. E., Green, R. A., Furuya, E. Y., Calfee, D. P., & Perotte, R. (2019). Identifying the risk factors for catheter-associated urinary tract infections: a large cross-sectional study of six hospitals. BMJ open 9(2), e022137. https://doi.org/10.1136/bmjopen-2018-022137</p> <p>Moore, K.N., & Franklin, L. (2016). Indwelling and intermittent catheterization. In D. Doughty & K. Moore (Eds.), Wound, Ostomy and Continence Nurses Society™ core curriculum: continence management (pp.232-249). Wolters Kluwer.</p> <p>National Healthcare Safety Network (NHSN). (2021a). Urinary tract infection (catheter-associated urinary tract infection [CAUTI] and non-catheter-associated urinary tract infection [UTI]) events. https://www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf</p> <p>NHSN. (2021b). The NHSN standardized infection ratio (SIR): a guide to the SIR. https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf</p> <p>Öztürk, R., & Murt, A. (2020, January 10). Epidemiology of urological infections: a global burden. World Journal of Urology 38,</p>
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	<p>2669-2679. https://doi.org/10.1007/s00345-019-03071-4</p> <p>Wound, Ostomy, and Continence Nurses Society™ (WOCN®). (2016). Care and management of patients with urinary catheters: a clinical resource guide. https://cdn.ymaws.com/member.wocn.org/resource/resmgr/document_library/Care_&_Mgmt_Pts_w_Urinary_Ca.pdf</p>
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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.