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## Clinical Practice Guideline on Reducing Catheter -Associated Urinary Tract Infections (CAUTIs)

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# Walden University

College of Nursing

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Walden University

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Executive Summary: Clinical Practice Guideline  
Clinical Practice Guideline on Reducing Catheter-Associated Urinary Tract Infections  
(CAUTIs)

by  
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## Summary

The project was a clinical practice guideline (CPG) for early catheter removal to prevent catheter-associated urinary tract infections (CAUTIs). At the project site, the practice gap was the surgical nurses' nonadherence to clinical guidelines for reducing CAUTIs. This gap resulted in inconsistent catheter care practices and delays in catheter removal. The purpose of this clinical practice guideline (CPG) was to enhance surgical nurses' knowledge and adherence to clinical guidelines for reducing CAUTI rates. Does the evidence support the development of an evidence-based CPG in acute care setting for early removal of the urinary catheter as validated by expert panel using the AGREE II tool and result in acceptance for use in practice?

The Appraisal of Guidelines for Research and Evaluation II (AGREE II) tool was used to review the developed clinical guidelines for reducing CAUTIs. I conducted a comprehensive literature review using the databases of PubMed, CINAHL, MEDLINE, Nursing Academic Search Premier, Allied Health Source, and the Cleveland Clinic Library Database. Four individuals were selected to make up the expert panel for this Doctor of Nursing Practice (DNP) project. I selected them based on their advanced clinical expertise and direct experience in infection prevention and nursing education.

All six domains revealed consistently high scores from the AGREE II expert panel evaluation, confirming that the created CPG aimed at lowering CAUTIs is credible, transparent, and relevant. This initiative promotes constructive social change in hospital care environments by equipping surgical nurses with the knowledge and resources to follow evidence-based recommendations for prevention of CAUTIs.

## **Background**

High numbers of catheter-associated urinary tract infections (CAUTIs) have become a serious health issue in most healthcare organizations (Rubi et al., 2022). The severity of the infections is marked by impaired patient care and safety as well as increased healthcare costs. In surgical settings, CAUTIs have become common since most patients in this unit require catheterization for long periods because of their complicated medical conditions, delayed removal procedures, and postoperative immobility (Gad & AbdelAziz, 2021). These infections, which can result in pyelonephritis, urosepsis, increased antibiotic use, extended hospital admissions, and, in extreme situations, patient death, are caused by bacteria or other germs that enter the urinary tract through an indwelling catheter (Scherberich et al., 2021). The financial burden associated with these infections is compounded by the risk of antimicrobial resistance and regulatory penalties tied to hospital-acquired infection rates.

The National Healthcare Safety Network supports the clinical relevance of catheter-associated urinary tract infections as evidenced by its report that approximately 75% of all hospital-acquired urinary tract infections stem from indwelling urinary catheters (Gaskin, 2021). Specifically, surgical patients are prone to CAUTIs because of their use of perioperative catheters, restricted mobility, and reduced physiological resilience, which has resulted in diminished patient outcomes (Rubi et al., 2022). Additionally, the significance of the CAUTIs issue is supported by the project site organization's data on the high CAUTIs rates (evidenced by 30% of CAUTIs occurring every 3 months and their negative impact on patients and the healthcare system, stemming from nonadherence to clinical guidance on reducing CAUTIs).

Inconsistent adherence to established clinical guidelines is a key factor contributing to the high rates of CAUTIs within the project site organization. The inconsistency is marked by only 40% of surgical nurses in the facility adhering to clinical guidelines for reducing CAUTI when caring for postsurgical patients, increasing CAUTI incidents. Additionally, nonadherence to the guidelines has led to lapses in key areas, including the application of aseptic technique during catheter insertion and the ongoing maintenance of sterile conditions. Given the negative impact, there is an urgent need to address the prevalence of CAUTIs within the organization by educating nurses on the importance of adhering to clinical guidelines for catheter removal, thereby reducing CAUTIs and informing clinical decision-making, ultimately improving infection control outcomes. Ideally, it is possible to bring about revolutionary change by tackling this problem with organized clinical recommendations. In addition to improving organizational performance measures and meeting national patient safety targets, the project also promotes equitable patient treatment by protecting vulnerable groups disproportionately affected by infections linked to catheter use.

I developed the following question to guide this project and effectively address this issue: In hospitalized patients in acute care settings, does early removal of the urinary catheter compared to leaving the catheter until discharge reduce the incidence of CAUTI? The project's purpose was to improve surgical nurses' adherence to clinical guidelines for reducing CAUTI by equipping them with targeted education on timely catheter removal and overall catheter management, as outlined in the clinical guidelines. Achieving the purpose will significantly lower the prevalence of CAUTIs among postsurgical patients.

Additionally, enhanced compliance with the clinical guideline will help nurses implement best practices, such as early catheter removal to reduce CAUTIs.

Sources of evidence for this DNP project included an extensive review of the literature and consultation with an expert panel specializing in infection prevention and catheter care. For the literature review, I searched databases, such as PubMed, CINAHL, MEDLINE, Nursing Academic Search Premier, Allied Health Source, and the Cleveland Clinic Library Database. Additional nursing resources included publications from the Centers for Disease Control and Prevention (CDC) and the Institute for Healthcare Improvement. Both primary research studies and systematic reviews were used to identify evidence-based education programs that promote nursing compliance with CAUTI prevention protocols. Using Walden University's literature review matrix tool, I applied search terms, such as *CAUTI prevention*, *clinical guidelines for urinary catheter care*, *nursing education*, *catheter removal protocols*, and *indwelling urinary catheter management*, to synthesize best practices. Based on the reviewed literature, I developed a clinical practice guideline (CPG) to guide surgical nurses in implementing strategies to reduce CAUTIs. Institutional Review Board approval was obtained from Walden University and the healthcare institution where the expert panel was employed prior to the project. The panel consisted of four infection control specialists who evaluated the literature and CPG using the AGREE II instrument to ensure content validity and guideline integrity.

Early removal is associated with a reduced risk of hospital-acquired infection and a faster recovery, without significantly increasing the risk of re-catheterization.

According to Castelo et al. (2020), Mattevi et al. (2021), McIntosh et al. (2022), and Fang

et al. (2024), early catheter removal can significantly lower the risk of hospital-associated infection, especially urinary tract infections, and encourage patients to leave the hospital bed as soon as possible. Additionally, Hammam et al. (2022) suggested that early catheter removal is more effective than delayed removal, as evidenced by reduced infections and shorter hospitalizations. Nollen et al. (2022) indicated that the effectiveness of early catheter removal, specifically Indwelling Urinary Catheter (IDUC), in minimizing urinary tract infections and promoting postoperative healing can be achieved by removing the IDUC as soon as possible. Sahadevan et al. (2024) suggested that early catheter removal, defined as removal within 24 hours following surgery, can reduce the risk of urinary tract infections.

Other studies by Hou et al. (2022) and Huang et al. (2020) demonstrated that the timing of catheter removal in gynecologic and colorectal surgeries, when compared based on precise postoperative timing, can help reduce hospital-associated infections. Xu et al.'s (2019) study, which focused on the timing of catheter removal following laparoscopic anterior rectum resection in gynecologic surgeries, demonstrated that early removal was effective in reducing urinary infections. Additionally, Beeler et al. (2021) demonstrated that implementing a nurse-driven catheter removal protocol in patients with epidural pain catheters provided practical insights into how nurse autonomy in catheter management can safely reduce catheter duration and infection rates, without relying on physician delays.

The reviewed evidence falls under Levels I and II according to Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Appraisal Tools, demonstrating high dependability, significant clinical relevance, and appropriateness for guiding practice

change in surgical care settings. The evidence's generalizability across a range of patient demographics and clinical settings is strengthened by the consistency of findings across several study settings. Numerous studies employed longitudinal tracking and multivariate analysis, which further supported the long-term durability of the results (Casarano et al., 2023). Incorporating well-defined intervention protocols and validated outcome measures strengthens the internal validity of the data, making this evidence a compelling foundation for implementing guideline-based CAUTI prevention strategies within surgical units.

### **CPG Development**

I selected four individuals to make up the expert panel for this DNP project. Their selection was based on their advanced clinical expertise and direct experience in infection prevention and nursing education. Each expert panelist held a doctorate and a master's degree in nursing practice, with specialized certification in infection control. Specifically, 2 of the 4 experts were nurse educators affiliated with the current academic institutions. The other two experts were senior clinical practitioners in acute care surgical units, with over a decade of experience implementing and teaching evidence-based catheter protocols to reduce infections. The selected expert panelists also had advanced experience in conducting CAUTI-related quality-improvement projects within their respective organizations of practice and in developing infection-control policies to reduce infections. Their key roles included serving as removal protocols. This entailed actively engaging in ongoing professional development and participating in conferences on hospital-acquired infection prevention. These experiences made them the ideal choice for

the expert panel, thereby ensuring a comprehensive and evidence-based examination of the CPG on reducing CAUTI.

I considered several factors when selecting the expert panel members. The individuals had to demonstrate competence in assessing evidence-based strategies, particularly those related to infection control and CAUTI reduction. The project site institution's infection control committee, clinical educators, and project-related academic mentors were asked for suggestions on panel participation. I purposefully chose the experts for their diverse educational backgrounds and professional settings to ensure a broad perspective and the CPG's relevance across clinical and educational areas.

The panel used the AGREE II methodology, a widely accepted framework for evaluating CPGs, to assess the appropriateness, relevance, and integrity of the drafted CPG. The AGREE II instrument is organized around six themes to evaluate the methodological rigor and transparency of guideline production (Brouwers et al., 2020). Stakeholder involvement, rigor of development, clarity of presentation, audience relevance, editorial independence, and scope and purpose are the six domains of the instrument.

The review process began with the four panelists reading the draft CPG independently and scoring each AGREE II item on the usual 7-point Likert scale, where 1 means *strongly disagree* and 7 means *strongly agree*. Scores were assigned based on how well the guideline handled the particular standards listed in each domain. For instance, the reviewers examined whether the guideline's therapeutic objective, target audience, and anticipated health outcomes were all clearly stated under the scope and

purpose domain. Under the domain of rigor of development, evaluators evaluated the methodical techniques employed to collect and combine the facts.

The panelists scored the material both numerically and qualitatively, highlighting any ambiguities or gaps. A few of their suggestions involved incorporating more detailed procedures for catheter removal, utilizing clinical decision-support images, and referencing the most recent Center for Disease Control and Prevention (CDC) and Society for Healthcare Epidemiology of America updates. I held a consensus meeting after the panel members' assessments, where scores were tallied, objections were discussed, and final adjustments were suggested based on group insights. The final CPG met high criteria for evidence, clarity, and usability thanks to this cooperative review.

In conclusion, the expert panel comprised a diverse group of individuals with backgrounds in clinical infection control, academic research, and guideline development. They used the AGREE II instrument for their systematic evaluation, which confirmed the guideline's legitimacy and increased its likelihood of being successfully applied in surgical settings to lower CAUTI rates.

### **Results**

All six domains received consistently high scores from the AGREE II expert panel evaluation, confirming that the created CPG aimed at lowering CAUTIs is credible, transparent, and relevant. Using a 7-point Likert scale, four professional reviewers with advanced degrees in infection control and nursing evaluated 23 items. The average score for the scope and purpose domain was 7, which reflects the guideline's well-defined objectives and intended patient demographic. With a score of 7, the stakeholder involvement domain indicated appropriate engagement, but the panelists recommended

more frontline end-user inclusion. A careful assessment of recent research and the incorporation of peer-reviewed evidence helped the rigor of development domain receive a score of 7.0. Reviewers praised the guideline's formatting and accessibility, giving the clarity of presentation domain a perfect score of 7.. With a rating of 7, the applicability domain indicated a high potential for implementation, but the panelists also called for more specific resource planning. Panelists praised the proposal's openness and objectivity, giving the editorial independence domain a score of 99.8%?

In their remarks, the reviewers emphasized the value of nurse-driven guidelines and requested additional visual aids to enhance understanding and uniformity.

Clarification of the catheter evaluation intervals and conformity to CDC standards were among the suggested revisions. The practical usefulness of the guideline was further strengthened when the panel met after individual reviews to achieve a consensus with 100% recommending the guideline for use based on shared findings.

The stakeholder review included surgical nurses, charge nurses, and infection control professionals, who examined the CPG in small-group discussions and educational in-services. Their response was largely enthusiastic. The structure, clarity, and practical suggestions of the guideline were valued by end users, especially those who encourage prompt catheter removal and emphasize nurse autonomy. To ensure broad acceptance, my recommendations are centered on incorporating the CPG into staff onboarding initiatives and continuing education courses.

Adopting this CPG inside the project site organization could have a significant impact. Improved patient recovery times, a quantifiable reduction in CAUTI rates, and lower healthcare-related expenses could result from successful adoption. Additionally,

adopting this CPG would reaffirm the institution's commitment to patient safety and evidence-based nursing practice while strengthening adherence to national standards established by organizations such as The Joint Commission and the Centers for Medicare & Medicaid Services.

The project had some limitations. Despite their excellent qualifications, the small number of expert panel members restricted diverse viewpoints. Despite their enthusiasm, stakeholders' contributions lacked long-term follow up and formal evaluation metrics. Furthermore, I explicitly designed the CPG for surgical facilities, which may limit its applicability in other care settings, such as long-term care or rehabilitation.

Notwithstanding these drawbacks, this project is significant for reasons far beyond the immediate institution. The burden of hospital-acquired infections and antibiotic resistance has made CAUTI prevention a national and international healthcare priority (Abban et al., 2023). By providing a validated, nurse-driven guideline, the project supports broader initiatives to standardize care, reduce avoidable harm, and advance evidence-based practice across various clinical settings. Additionally, other hospitals seeking to enhance their catheter care protocols may utilize the replicable model provided by the AGREE II-reviewed framework.

### **Conclusions**

This CPG for reducing CAUTIs had a significant impact on the project site organization's practice. Specifically, improving nursing staff adherence to evidence-based catheter management practices, particularly regarding timely removal and aseptic technique, resulted in improved patient safety outcomes, lower rates of hospital-acquired infections, shorter hospital stays, and lower healthcare costs. Additionally, these results

foster a culture of accountability and quality enhancement while promoting regulatory compliance and accreditation.

Based on the results obtained from the project, developing a competency-based training module for onboarding and continuing education, as well as extending the CPG to departments other than surgical units, can help strengthen the initiative. Integrating catheter care protocols into electronic health records for real-time guidance is another way to strengthen the initiative. Additionally, future audits and feedback loops should also be included to ensure long-term adherence and identify new deficiencies.

The CPG highlights nurses' crucial role in infection prevention and advocates for clinical autonomy in nursing practice. The project encourages interdisciplinary cooperation while enabling nurses to make prompt, evidence-based judgements. Regardless of provider or setting, the guideline promotes equitable patient care by standardizing catheter care across diverse teams. From a social change perspective, the project promotes a proactive healthcare culture that prioritizes the safety and dignity of each patient. By attending to the requirements of vulnerable groups, such as persons 65 years and older and immunocompromised populations, who may be more at risk from extended catheterization, it also highlights inclusive practice.

Pre- and posteducation surveys, which measured nurse knowledge, self-efficacy, and confidence in implementing CAUTI prevention procedures, were part of the assessment approach used to gauge effectiveness. The comments from end users and expert panelists provided qualitative information about the impact and usability. When combined, these data provided a thorough understanding of the intervention's results and can be used to inform the initiative for ongoing improvement.

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