

Implementing Diverse Strategies to Reduce the Density of Catheter-Associated Urinary Tract Infections in Internal Medicine Wards

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INTRODUCTION

According to Taiwan's hospital infection statistics, Catheter-Associated Urinary Tract Infections (CAUTIs) account for approximately 30%-40% of all healthcare-associated infections, with a mortality rate up to 32.8%. These infections extend hospital stays, increase medical costs, and worsen disease severity. In our internal medicine ward, which treats patients with cerebral stroke requiring long-term bed rest, the catheter usage rate is 72.7%. In the first quarter of 2023, the CAUTI density was 2.8‰, exceeding both the peer 75th percentile value of 2.45‰ and the 2022 intensive care unit infection density of 2.2‰. Analysis identified a combined care completion rate of 85.1%, catheter care technique accuracy of 84.1%, an average catheter indwelling time of 28.6 days, and the use of inappropriate urine collection containers. We aim to reduce CAUTI and enhance patient safety and care quality through diversified strategies.

Methods

- 1. Implement Care to Prevent Catheter-Associated Urinary Tract Infections:** This includes practicing hand hygiene before and after catheter placement, employing aseptic techniques for catheter insertion, and ensuring correct catheter fixation.
- 2. Developing Catheter Care and Removal in Combined Protocols:** Daily assessments are conducted to remove catheters from patients not meeting the indications for catheterization, evaluating patients' ability to void on their own, utilizing intermittent catheterization, and assessing residual urine. Monitoring intervals for residual urine less than 100cc are extended until successful catheter removal. (Figure1)
- 3. Incorporating Evidence-Based Nursing in Clinical Practice:** Evidence-based research has shown that mannose formulations significantly improve recurrent urinary tract infections, reaching statistical significance ($p < .05$), thus preventing recurrent infections. Mannose formulations are recommended for use following physician evaluation.
- 4. Hosting Multimodal Catheter Care Training Workshops:** Utilizing the ARCS (Attention, Relevance, Confidence, Satisfaction) model to motivate caregivers and nurses, with practical exercises in catheter care techniques, group discussions, and immediate feedback. (Figure2)
- 5. Optimizing Urine Collection Devices:** Switching from urinals to large urine collection bottles to minimize contact with surrounding objects during handling. (Figure3)

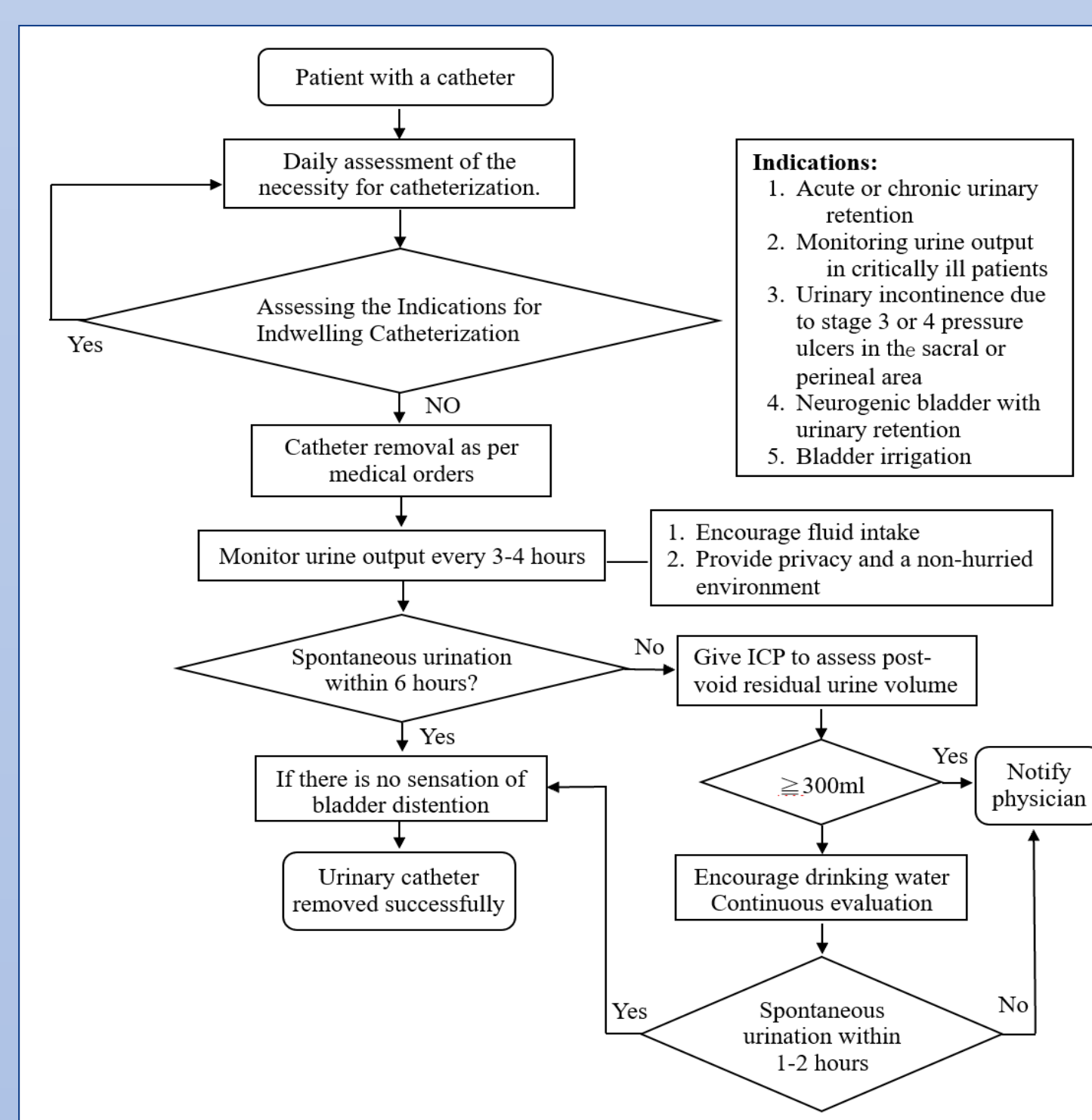


Figure1.
Urinary Catheter Care and Removal Flowchart



Figure2. Catheter care training Workshops

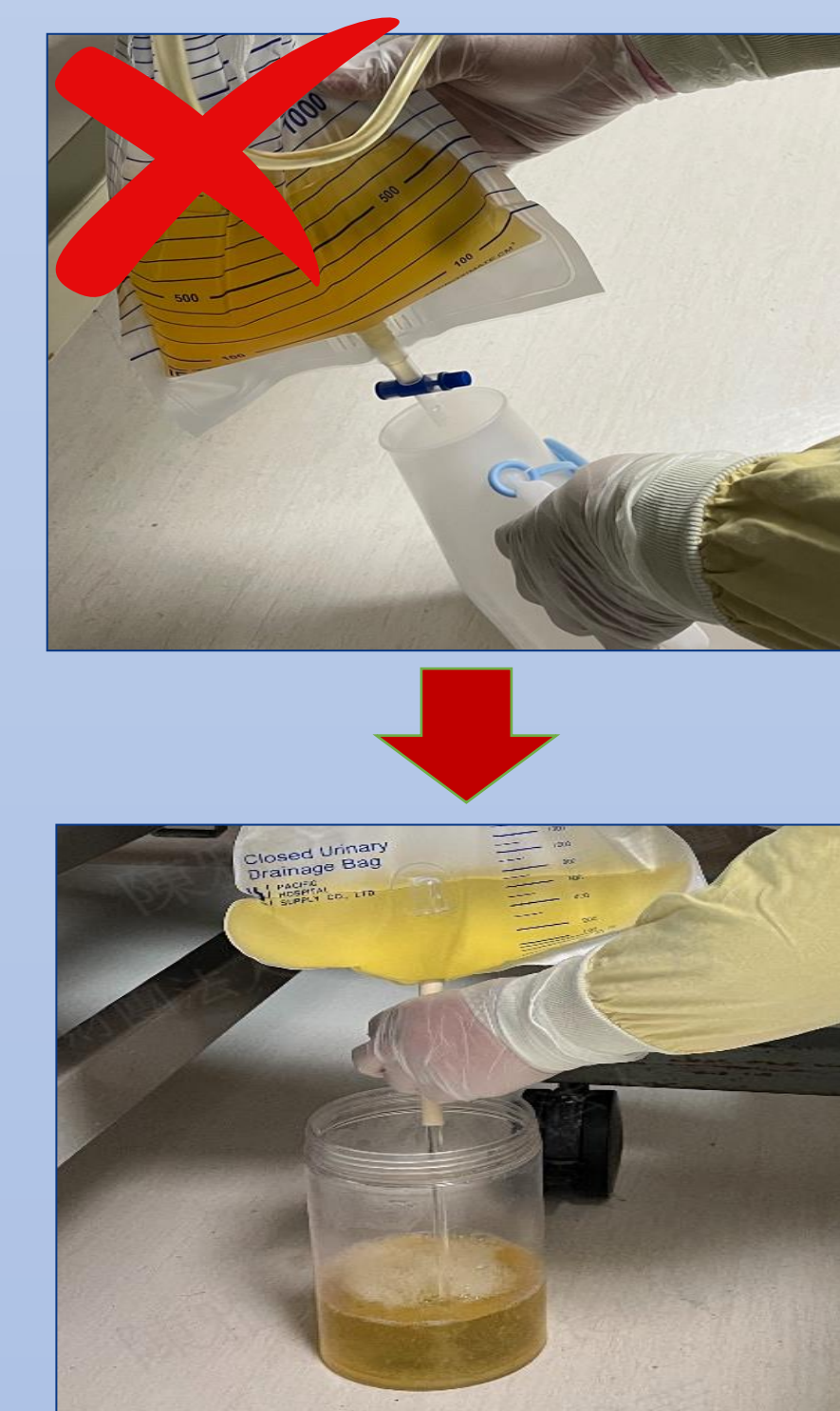
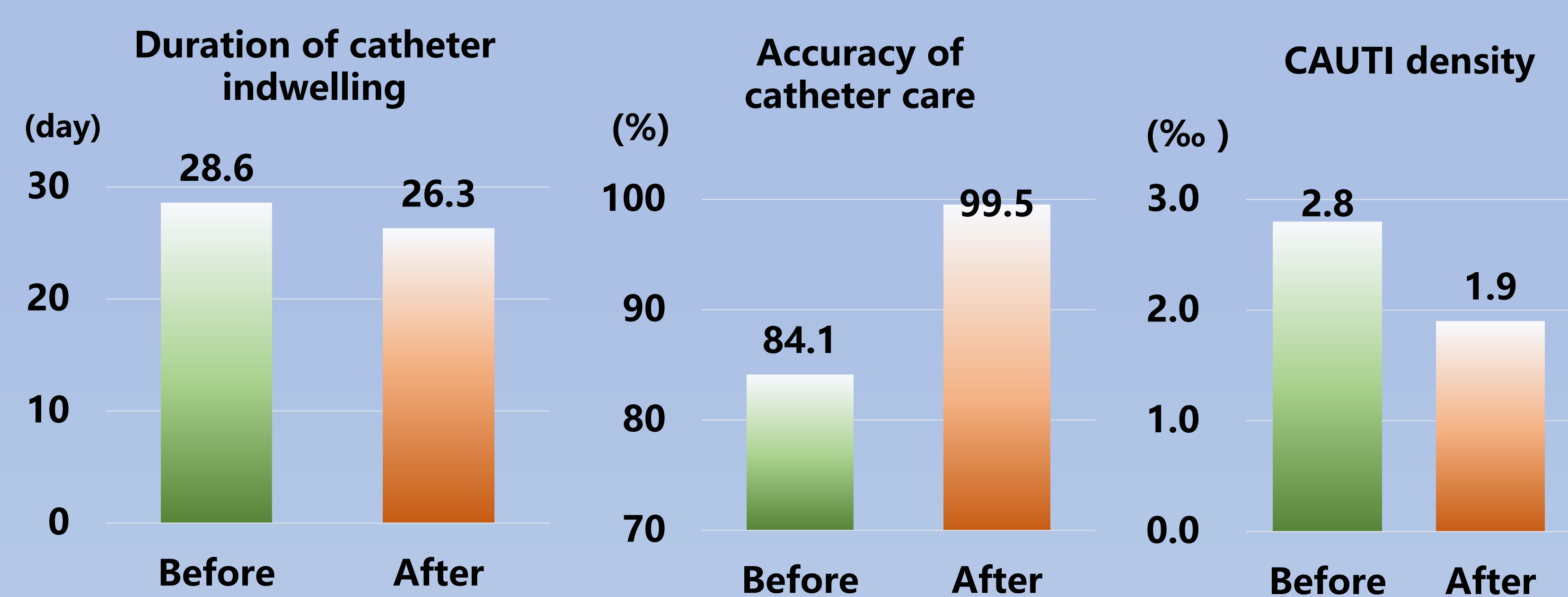


Figure3. Optimizing Urine Collection Devices

Results

Following the implementation of diverse strategies, the medical team collaboratively evaluated catheter indications, promoting early removal mechanisms. From July 1 to July 31, 2023, 3 patients with long-term catheters were successfully decatheterized, reducing the average catheter indwelling time to 26.3 days. The completeness of combined care improved to 99.8%, and the accuracy of catheter care increased to 99.5%. The CAUTI density was reduced to 2.0‰ in June 2023, with a further decrease to 1.9‰ projected for the third quarter of 2023.



Conclusion

Urinary tract infections are a common complication in patients using catheters, with a 3%-7% daily risk of developing CAUTI. The medical team must address catheter care issues collectively, accurately assessing patients for catheterization indications and infection risks before placement, and evaluating the possibility of early removal after placement. Establishing guidelines for the prevention of catheter-associated urinary tract infections and providing nursing staff with evidence-based care plans are urgent. Employing diverse strategies to ensure patient safety and improve quality of life is imperative.