Journal of Biosciences and Medicines, 2026, 14(4), 115-127
https://www.scirp.org/journal/jbm
ISSN Online: 2327-509X
ISSN Print: 2327-5081

Nursing Practice for Reducing the Incidence of Catheter-Associated Urinary Tract Infections in Inpatients with Stroke

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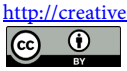
How to cite this paper: Luo, Q.Y. and Liu, J.H. (2026) Nursing Practice for Reducing the Incidence of Catheter-Associated Urinary Tract Infections in Inpatients with Stroke. *Journal of Biosciences and Medicines*, **14**, 115-127.
https://doi.org/10.4236/jbm.2026.144010

Received: March 4, 2026
Accepted: April 12, 2026
Published: April 15, 2026



Abstract

Objective: To explore the effect of nursing quality improvement and process optimization via Quality Control Circle (QCC) on reducing the incidence of Catheter-Associated Urinary Tract Infections (CAUTI) in inpatients with stroke, analyze its impacts on the duration of urinary catheter indwelling, hospital stay and the professional quality of nursing staff, and provide evidence for the improvement of clinical nursing quality. **Methods**: A nursing quality improvement team was established to carry out theme improvement activities focusing on "reducing the incidence of CAUTI in inpatients" by adopting the QCC method. The nursing process was systematically optimized through status investigation, cause analysis, goal setting, countermeasure implementation and effect evaluation. Patients in the Stroke Ward of the Department of Neurology of our hospital were selected as the research subjects, with cases from January to June 2025 as the pre-intervention cohort and cases from July to December 2025 as the post-intervention cohort, to conduct a before-and-after controlled nursing quality improvement study. A QCC team was set up to promote improvement activities for reducing the incidence of CAUTI. After identifying core problems, measures such as system establishment, process optimization, hierarchical training and whole-process quality control were implemented to optimize the urinary catheter nursing process and evaluate its effect. **Results**: After the intervention, the incidence of CAUTI decreased from 5.37‰ before improvement to 2.72‰, with an achievement rate of 68% and a progress rate of 48.37%. The average duration of urinary catheter indwelling was reduced from 6.8 days to 3.86 days, and the average hospital stay of patients was shortened from 14.5 days to 12.3 days. The differences in all indicators were statistically significant ($P < 0.05$). The comprehensive quality of nursing staff, such as a sense of responsibility and team cooperation ability,

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was significantly improved. **Conclusion**: Nursing process optimization and quality improvement through QCC activities can effectively reduce the incidence of CAUTI in inpatients with stroke, shorten the duration of urinary catheter indwelling and hospital stay, and improve nursing quality, which is worthy of clinical promotion.

Keywords

Catheter-Associated Urinary Tract Infection, Nursing Quality Improvement, Quality Control Circle, Hospital Stay

1. Introduction

Catheter-Associated Urinary Tract Infection (CAUTI) is one of the most common types of nosocomial infections, accounting for 20.8% - 31.7% of all nosocomial infections, among which 75% are associated with indwelling urinary catheters [1]. CAUTI not only prolongs patients' hospital stay and increases medical expenses, but also can lead to serious complications such as renal papillary necrosis and sepsis, increasing the mortality rate by three times [2]. Patients with stroke often need indwelling urinary catheters due to disorders of consciousness and limited limb movement, making them a high-risk group for CAUTI [3].

In accordance with the requirements of the *Standards for the Review of Tertiary Hospitals* (2022 *Edition*) and the 2025 *Nursing Management Objective Responsibility Letter*, reducing the incidence of CAUTI has become an important part of nursing quality management [4]. Therefore, our department carried out a QCC-based nursing quality improvement activity themed "reducing the incidence of CAUTI in inpatients with stroke" from January to December 2025. The clinical effectiveness of the intervention measures was verified through a before-and-after controlled study, and good results were achieved.

2. Materials and Methods

2.1. General Information

Inpatients with indwelling urinary catheters in the general Stroke Ward of the Department of Neurology of our hospital from January to December 2025 were selected as the research subjects. A before-and-after controlled design was adopted in this study, which was divided into the pre-intervention cohort (January to June 2025) and the post-intervention cohort (July to December 2025). The two groups of patients adopted unified inclusion and exclusion criteria, and the baseline conditions, such as the allocation of medical and nursing staff in the ward, ward management norms and basic nursing processes, were consistent, ensuring the comparability of the study.

Inclusion criteria: ① Diagnosis of ischemic or hemorrhagic stroke confirmed by cranial CT/MRI examination; ② Duration of indwelling urinary catheter ≥ 48 hours; ③ Receiving routine nursing care in the department throughout the hos-

pital stay, and the post-intervention cohort receiving the comprehensive CAUTI prevention and control intervention measures formulated in this study simultaneously.

Exclusion criteria: ① Outpatients and emergency observation patients; ② Patients with complicated urinary tract infection or other nosocomial infections at admission; ③ Patients who were transferred to other departments, discharged or died during the indwelling of urinary catheter and failed to complete the whole observation; ④ Patients with complicated serious underlying diseases such as hepatic and renal failure, malignant tumors and immunodeficiency diseases.

This study was approved by the Hospital Ethics Committee, and informed consent was signed by all patients and their family members.

2.2. Methods

The QCC method was adopted to carry out quality improvement activities. An improvement team consisting of a head nurse as the group leader and 8 nurses was established, and activities were carried out in accordance with the steps of "theme selection, status investigation, cause analysis, goal setting, countermeasure implementation, effect evaluation and continuous improvement".

2.2.1. Status Investigation and Cause Analysis

From February 3 to March 2, 2025, a survey was conducted on patients with indwelling urinary catheters in the department using the *Checklist of Influencing Factors of Catheter-Associated Urinary Tract Infections*. The results showed that five problems, including unclean urethral orifice, unclamped urinary catheter during transfer, unassessed extubation indications, non-standard fixation of urinary catheter and urine volume exceeding 3/4 of the drainage bag, accounted for 83.33%, which were the key points for improvement (see Table 1). Through fishbone diagram analysis, the causes were sorted out from four dimensions of human, method, material and environment, and three root causes of CAUTI were identified: non-standard nursing behaviors, lack of professional knowledge of accompanying staff, and absence of standardized CAUTI management processes in the department.

Table 1. Distribution of influencing factors of CAUTI before improvement.

Influencing Factors	Occurrence Frequency	Proportion (%)	Cumulative Proportion (%)
Unclean urethral orifice and surrounding skin	28	23.33	23.33
Unclamped urinary catheter during transfer and turning over	26	21.67	45.00
Unassessed extubation indications of patients	24	20.00	65.00
Non-standard fixation of urinary catheter	22	18.33	83.33
Urine volume exceeding 3/4 of the drainage bag	20	16.67	100.00
Total	120	100.00	-

Note: A total of 120 problems were found in this survey, and the five core problems accounted for 83.33% in total.

2.2.2. Goal Setting

Based on the baseline CAUTI incidence of 5.37‰ before the intervention, combined with the QCC capability score (85.75%) and the key improvement points (83.03%, an approximate value of 83.33% was used for target value calculation), the quality improvement target value calculation formula was adopted: Target value = Baseline value − (Baseline value × QCC capability × Key improvement points). The calculated target value of CAUTI incidence for this activity was: 5.37‰ − (5.37‰ × 85.75% × 83.33%) ≈ 1.54‰.

2.2.3. Countermeasure Implementation

In view of the core causes and key problems of CAUTI in patients with stroke, seven major prevention and control measures were systematically implemented with the Stroke Ward of the Department of Neurology as the execution unit, and a comprehensive prevention and control system of "standardized management - whole-process standardization - hierarchical training - personalized prevention and control - health education - quality control and supervision - incentive mechanism" was constructed.

1) System Establishment: Constructing a Standardized Management System for the Department

a) System learning and implementation: Led by the QCC team, 2 special training sessions on the *Core Standard Manual for CAUTI Prevention and Control Quality* were organized for all staff in the Stroke Ward (including physicians, nurses, advanced training personnel and standardized training physicians) within 1 week, with a single learning duration of no less than 1 hour. The training focused on the detailed interpretation of indications for urinary catheterization in stroke patients, 8 contraindications for catheterization, and nursing key points for special patients, such as those with disorders of consciousness and limited limb movement. The attendance and learning records were kept to ensure that all staff mastered the CAUTI diagnostic criteria and targeted prevention and control processes for stroke patients proficiently, and implemented all work in strict accordance with the requirements of the manual.

b) Standardized management of departmental data: One member of the QCC team was designated as the infection control nurse, responsible for the daily collection, sorting and reporting of CAUTI-related data in the Stroke Ward. The information, such as the number of catheterization cases, indwelling time, nursing measures (urethral orifice cleaning, implementation of urinary catheter clamping, etc.) and suspected infection cases of patients with indwelling urinary catheters on the day should be entered before 17:00 every day, and key problems should be recorded in accordance with the *Checklist of Influencing Factors of Catheter-Associated Urinary Tract Infections*. Cooperate with the Hospital Infection Management Department to complete data review actively, and after receiving the *CAUTI Prevention and Control Data Brief* every month, the QCC team organizes the analysis of the ward's prevention and control effect and existing weak links.

c) Internal assessment and continuous improvement of the department: The

head nurse organizes a monthly assessment of CAUTI prevention and control knowledge and operation skills in the Stroke Ward, covering theoretical knowledge and practical skills, with a focus on aseptic operation technology, urethral orifice nursing for stroke patients and assessment of extubation indications. Specialized stroke scenarios such as catheter fixation for patients with disorders of consciousness and urinary catheter clamping during transfer are added in the practical assessment, and the assessment results are linked to personal performance. For those who fail the assessment, the backbone of the QCC team provides one-on-one tutoring and intensive training, and they can only pass after making up the exam.

2) Process Optimization: Standardizing the Whole-Cycle Operation Process of Urinary Catheterization for Stroke Patients

a) Before catheterization: Adhere to the principle of "no unnecessary catheterization", and clarify and implement the indications and negative list for urinary catheterization. For patients who really need indwelling urinary catheters, the attending physician issues a urinary catheterization order. After verifying the indications, the responsible nurse, together with the physician, comprehensively evaluates the infection-related risk factors, such as the patient's underlying diseases and immune function, and selects a suitable size of silicone urinary catheter and closed drainage system to reduce unnecessary indwelling urinary catheterization from the source.

b) During catheterization: Strictly implement the principle of aseptic technology during the operation, and medical staff wear sterile gloves, masks and hats in a standardized manner. The disinfection diameter of the urethral orifice for male patients is not less than 15 cm, and female patients are disinfected in the order of urethral orifice, vaginal orifice and perianal area. The operation should be gentle to reduce urethral mucosal injury, and the urinary catheter should be fixed properly. After the operation, the closed drainage bag should be connected immediately, and the operation-related information should be recorded completely.

c) After catheterization: Adhere to the principle of "no unnecessary irrigation", and aseptic irrigation can only be implemented after physician evaluation in special cases, such as catheter blockage and severe infection. Keep the drainage bag lower than the bladder level to avoid urine reflux, replace the drainage bag every day, and replace it immediately if the closed drainage system is damaged. Strengthen the special nursing of the urethral orifice: the responsible nurse performs urethral orifice cleaning and nursing twice a day (morning and evening). If secretions are found at the urethral orifice in other time periods, clean and dry it with warm water in a timely manner, spray antibacterial spray in line with hospital infection prevention and control guidelines evenly at a distance of 15 - 20 cm from the urethral orifice, covering the urethral orifice and the surrounding 2 - 3 cm area. Arrange the clothes after the spray dries naturally without wiping to ensure the integrity of the antibacterial film. At the same time, guide and assist patients to keep the local area clean and dry, turn over regularly to avoid catheter compression;

strictly clamp the urinary catheter during transfer, turning over and other operations to reduce the risk of infection caused by urine reflux.

3) Training and Education: Improving the Specialized Prevention and Control Capability of All Staff in the Department for Stroke

a) Internal training of the department: The QCC team formulates an annual CAUTI prevention and control training plan for the Stroke Ward, and carries out one internal training session every month (combination of online independent learning and offline practical drill); the stroke patient prevention and control guidelines and catheter nursing operation videos are pushed online, and skill drills are carried out offline using morning meeting and professional learning time, focusing on training specialized skills for stroke such as "aseptic operation for patients with disorders of consciousness", "catheter fixation for patients with limited limb movement" and "urinary catheter clamping during transfer".

b) Implementation of hierarchical training:

- Medical and nursing staff: The backbone of the QCC team acts as the tutor to provide one-on-one tutoring for new employees and advanced training personnel, focusing on guiding the risk assessment of stroke patients, judgment of extubation indications and emergency treatment (such as catheter prolapse and urine reflux), to ensure that they master the specialized skills proficiently before independent operation; a full staff assessment is organized every quarter, and those who fail the assessment are suspended from the relevant operation qualification and required to rectify within a time limit.
- In view of the lack of professional knowledge of accompanying staff: the responsible nurse carries out one-on-one health education and training for accompanying staff within 24 hours after the patient's indwelling urinary catheter, and distributes a simple manual of catheter nursing for stroke patients, focusing on explaining the points such as avoiding pulling the catheter when assisting in turning over, reminding nurses to clamp the urinary catheter before transfer, precautions for urethral orifice cleaning and identification of infection early warning signals. After the training, the mastery degree is confirmed through on-site questions, and relevant records are made.

4) Personalized Assessment: Precisely Implementing Individualized Prevention and Control Measures for Stroke Patients

a) Daily assessment of extubation indications: The responsible nurse assesses the extubation indications of catheterized patients every morning in combination with the recovery of consciousness, urination function (such as spontaneous urge to urinate, bladder fullness) and laboratory test results of stroke patients, and fills in the *CAUTI Extubation Indication Assessment Form*; for conscious patients who can urinate spontaneously, inform the attending physician to issue an extubation order in a timely manner and remove the catheter as early as possible to shorten the indwelling duration; for patients with disorders of consciousness who do not meet the extubation conditions temporarily, mark the observation points (such as the improvement of limb movement), adjust the prevention and control

measures dynamically, and re-assess on the next day.

b) Catheter fixation and observation: The responsible nurse selects suitable fixation devices according to the age, body shape, consciousness state and activity ability of stroke patients (such as anti-traction fixation belt for restless patients) to avoid catheter traction and displacement; for patients with disorders of consciousness and restlessness, use restraint belts in accordance with norms (physician's order required), release them regularly and observe the limb blood supply; focus on observing whether there is redness, swelling and exudation at the catheterization site during morning and evening nursing, and check the catheter fixation at the same time. If problems are found, handle and report to the QCC team in a timely manner.

c) Hand hygiene management: The head nurse is responsible for the inspection and supplement of hand hygiene facilities in the ward, and equips hand sanitizers for rapid hand disinfection in wards, treatment rooms and transfer carts; the responsible nurse supervises medical and nursing staff to strictly implement hand hygiene norms before and after contacting stroke patients and before and after catheter operations. The QCC team conducts random spot checks every week to ensure that the hand hygiene compliance rate in the ward is not less than 95%.

5) Health Education: Improving the Cooperation and Participation of Patients and Their Family Members

a) Implementation of personalized health education: The responsible nurse popularizes CAUTI knowledge in plain language combined with the consciousness state of stroke patients and the cognitive level of family members, focusing on emphasizing the cooperation points such as "do not adjust the catheter by oneself", "remind nurses to clamp the urinary catheter before patient transfer" and "inform nurses in a timely manner if secretions are found at the urethral orifice"; guide family members to identify infection early warning signals (fever, turbid urine, aggravated restlessness of patients, etc.), and call medical staff in a timely manner if abnormalities occur.

b) Implementation of health education forms: A CAUTI prevention and control publicity rack is set up at the nurses' station of the ward, with exclusive publicity manuals for stroke patients placed; for elderly family members, the memory is strengthened by the way of "demonstration + pithy formula" (such as "Clamp the catheter first before transfer, protect the catheter when turning over"); a 3 - 5 minute health education video on catheter nursing for stroke patients is played in a loop on the ward TV for family members to learn repeatedly.

c) Strengthening at key nodes: The responsible nurse reinforces the core health education content again at key nodes such as within 24 hours after catheterization, 1 day before extubation and 1 day before discharge; for stroke patients discharged with indwelling catheters, provide family members with the *Home Catheter Nursing Guide*, clarifying the key points of home nursing, reexamination time and emergency treatment methods to improve the effect of home prevention and control.

6) Quality Control and Supervision: Constructing a Specialized Closed-Loop Management Model for Stroke

a) Daily self-inspection and recording: The responsible nurse fills in the *CAUTI Prevention and Control Daily Record Form* every day, recording the catheterization status, nursing operations (including urethral orifice cleaning and urinary catheter clamping) and extubation assessment results of stroke patients in detail; conduct self-inspection before getting off work every day, and rectify in accordance with the key problems in the status investigation (unclean urethral orifice, unclamped catheter during transfer, etc.) to ensure the implementation of measures.

b) Spot check and supervision by the head nurse: The head nurse randomly spot-checks more than 30% of catheterized patients in the ward every month, focusing on verifying the standardization of aseptic operation, timeliness of extubation assessment, authenticity of data recording and qualification rate of urethral orifice nursing; feedback the found problems on the spot, issue a rectification notice, require completion of rectification within 24 hours, and the QCC team tracks the rectification effect to form a management closed loop.

c) Continuous improvement of the department: The QCC team collects the ward's prevention and control data and self-inspection results every month, combines with the hospital's *Monthly CAUTI Prevention and Control Quality Control Report*, holds a quality control analysis meeting, sorts out common problems (such as inadequate training of accompanying staff, non-standard catheter nursing for restless patients), formulates targeted improvement measures, and incorporates them into the key work of the next month to continuously improve the prevention and control quality.

7) Incentive Mechanism: Stimulating the Enthusiasm of All Staff to Participate in Prevention and Control Work

a) Departmental recommendation and publicity: The head nurse selects candidates for rewards on a merit basis every month in combination with the implementation of prevention and control measures by responsible nurses, the infection incidence of patients under their charge, the integrity of data records and the evaluation results of the QCC team, publicizes them in the ward for 1 day, and reports them to the Hospital Quality Control Department if there is no objection.

b) Internal commending and supervision: Nurses who have won the hospital's special rewards are publicly praised at the ward's morning meeting, and their nursing experience for stroke patients is shared; for nurses who fail to implement the prevention and control measures in place, the backbone of the QCC team provides one-on-one conversation and guidance, and the rectification effect is linked to performance appraisal, evaluation and selection of advanced individuals.

2.3. Evaluation Indicators

1) CAUTI incidence (‰) = Number of urinary tract infection cases in stroke patients with indwelling urinary catheters in the same period/Total days of uri-

nary catheter indwelling in the statistical cycle × 1000‰. The diagnosis of CAUTI in this study refers to the *Framework of the Standard System for Hospital Infection Prevention and Control* [1], which requires meeting clinical symptoms such as frequent micturition and urgent micturition with urine culture colony count ≥ 10^5 cfu/mL, and is initially screened by the departmental infection control nurse and confirmed by the physician of the Hospital Infection Management Department through review.

2) Average duration of urinary catheter indwelling = Total days of urinary catheter indwelling in the statistical cycle/Number of patients with indwelling urinary catheters in the same period.

3) Average hospital stay = Total hospital days in the statistical cycle/Number of discharged patients in the same period.

4) Achievement rate = (Before improvement − After improvement)/(Before improvement − Target value) × 100%.

5) Progress rate = (Before improvement − After improvement)/Before improvement × 100%.

6) Comprehensive quality of nursing staff: A 5-point scoring system (1 point for the lowest, 5 points for the highest) was adopted to evaluate from 5 dimensions: a sense of responsibility, team cooperation ability, communication ability, mastery of QCC methods and problem-solving ability.

2.4. Statistical Methods

SPSS 26.0 statistical software was used for data analysis. Measurement data were expressed as ($\overline{x} \pm s$), and independent sample t-test was used for comparison between groups; count data were expressed as rate (%) or permillage (‰), and χ^2 test was used for comparison between groups. The CAUTI incidence was compared with catheter-days as the exposure factor, with a test level of $\alpha = 0.05$. A P value < 0.05 was considered statistically significant.

3. Results

3.1. Comparability of Baseline Data between the Two Groups

There were 356 cases in the pre-intervention cohort and 382 cases in the post-intervention cohort. There were no statistically significant differences in age, gender, type of stroke, degree of consciousness disorder, grade of limited limb movement, composition of catheterization indications and the burden of complications such as hypertension, diabetes and coronary heart disease between the two groups (P > 0.05), with good comparability.

3.2. Comparison of CAUTI Incidence before and after Improvement

The total days of urinary catheter indwelling before the intervention were 2421 days, with 13 confirmed CAUTI cases and an incidence of 5.37‰ (95% CI: 2.98‰ - 8.76‰); the total days of urinary catheter indwelling after the intervention were

1475 days, with 4 confirmed CAUTI cases and an incidence of 2.72‰ (95% CI: 0.74‰ - 6.98‰). The incidence of CAUTI after the intervention was significantly lower than that before the intervention ($\chi^2 = 4.236$, P = 0.039). The achievement rate of this quality improvement activity was 68% and the progress rate was 48.37% (see Table 2).

Table 2. Comparison of CAUTI incidence before and after improvement.

Time	Number of Patients with Indwelling Urinary Catheter	Total Indwelling Days	Number of Confirmed CAUTI Cases	Incidence (‰)	95%CI
Before improvement (Jan.-Jun. 2025)	356	2421	13	5.37	2.98‰ - 8.76‰
After improvement (Jul.-Dec. 2025)	382	1475	4	2.72	0.74‰ - 6.98‰

Note: CAUTI incidence = Number of infection cases/Total indwelling days ×1000‰; $\chi^2 = 4.236$, P = 0.039 for comparison between groups.

3.3. Comparison of the Duration of Urinary Catheter Indwelling and Hospital Stay before and after Improvement

After the intervention, the average duration of urinary catheter indwelling of patients was reduced from 6.8 days to 3.86 days, and the average hospital stay was shortened from 14.5 days to 12.3 days (see Table 3). The differences in the two indicators before and after improvement were highly statistically significant (P < 0.001), indicating that nursing process optimization not only reduces the risk of infection, but also promotes the rehabilitation process of patients.

Table 3. Comparison of the duration of urinary catheter indwelling and hospital stay before and after improvement ($\bar{x} \pm s$).

Indicators	Before improvement (Jan.-Jun. 2025)	After improvement (Jul.-Dec. 2025)	t value	P value
Average duration of urinary catheter indwelling (d)	6.8 ± 1.5	3.86 ± 1.2	28.642	<0.001
Average hospital stay (d)	14.5 ± 2.3	12.3 ± 2.1	12.578	<0.001

Note: Data were expressed as ($\bar{x} \pm s$), and independent sample t-test was used for comparison between groups.

Table 4. Comparison of the comprehensive quality scores of nursing staff before and after improvement ($\bar{x} \pm s$, 5-point scale).

Evaluation Items	Before Improvement	After Improvement	Improvement Range	t value	P value
Sense of responsibility	3.2 ± 0.6	4.6 ± 0.4	+1.4	15.166	<0.001
Team cooperation ability	3.1 ± 0.5	4.7 ± 0.3	+1.6	22.821	<0.001
Communication ability	3.3 ± 0.5	4.5 ± 0.4	+1.2	13.928	<0.001
Mastery of QCC methods	2.8 ± 0.7	4.4 ± 0.5	+1.6	18.475	<0.001
Problem-solving ability	3.0 ± 0.6	4.6 ± 0.4	+1.6	19.231	<0.001

Note: Data were expressed as ($\bar{x} \pm s$), and independent sample t-test was used for comparison between groups.

3.4. Comparison of the Comprehensive Quality of Nursing Staff before and after Improvement

After the implementation of QCC activities, the scores of nursing staff in 5 dimensions, including a sense of responsibility, team cooperation ability, communication ability, mastery of QCC methods and problem-solving ability, were significantly higher than those before improvement (see **Table 4**), and the differences in all indicators between groups were highly statistically significant ($P < 0.001$).

4. Discussion

4.1. QCC Activities Help to Improve Nursing Quality

QCC activities emphasize the participation of all staff and autonomous management, which can effectively stimulate the subjective initiative of nurses [5]. Through systematic analysis and continuous improvement, this activity significantly reduced the incidence of CAUTI, verifying the effectiveness of QCC in infection prevention and control.

4.2. Standardized Processes Are the Key to Prevention and Control

Studies have shown that the standardization of urinary catheter management is the core of reducing CAUTI [6]. This activity established a whole-process management process from catheterization to extubation, strengthened key links such as daily assessment, standard fixation and hand hygiene, and effectively reduced the risk of infection.

4.3. Shortening the Duration of Urinary Catheter Indwelling Helps to Shorten Hospital Stay

This study showed that with the reduction of the duration of urinary catheter indwelling, the average hospital stay of patients was also shortened accordingly, which was consistent with the conclusions of relevant domestic studies [7]. It suggests that early removal of unnecessary urinary catheters can not only reduce the risk of infection, but also accelerate the rehabilitation of patients and save medical resources.

4.4. Incentive Mechanism Improves the Enthusiasm of Nurses

The establishment of an incentive mechanism has enhanced the executive power of nurses for prevention and control measures, improved team cohesion, and laid a foundation for continuous improvement.

4.5. Research Limitations and Prospects

This study is a single-center before-and-after controlled quality improvement study, and the research subjects are all from the Stroke Ward of the Department of Neurology of our hospital, with limited sample size and research scope, which may limit the extrapolation of the research results. In the future, multi-center and

large-sample cohort studies can be carried out to further verify the effect of QCC-based nursing process optimization on CAUTI prevention and control in different grades of hospitals and different specialized wards. In addition, this study did not conduct follow-up on the long-term prognosis of patients after discharge. In the future, follow-up links can be added to observe the long-term effects of CAUTI prevention and control measures on indicators such as the recurrence rate of urinary tract infection, recovery of urination function and quality of life of patients after discharge, so as to provide a more comprehensive clinical basis for the whole-process prevention and control of CAUTI.

5. Conclusion

Through carrying out QCC nursing quality improvement activities, this study constructed and implemented a comprehensive CAUTI prevention and control system for inpatients with stroke, which effectively reduced the incidence of CAUTI, significantly shortened the duration of urinary catheter indwelling and average hospital stay of patients, and improved the comprehensive quality of nursing staff and the level of nursing quality management in the department at the same time. This prevention and control model is scientifically designed, easy to operate and has a significant effect, which meets the actual needs of clinical nursing quality improvement and has important clinical promotion value. It can be popularized and applied in the Department of Neurology of all levels of hospitals and other specialized wards with high-risk factors of CAUTI, providing practical reference for hospital infection prevention and control and continuous improvement of nursing quality.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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