

Section: Medical Surgical Nursing

Bladder training for urinary incontinence treatment in a patient with ischemic stroke

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Abstract

The assessment and data analysis indicated that the patient experienced decreased bladder tone following catheter use, with no sensation of the urge to urinate, and urinary elimination occurred only through the catheter. On the second day, the patient began to feel the urge to urinate and was able to hold it for one hour. By the third day, the patient was able to urinate spontaneously with appropriate volume and frequency. The nursing diagnosis established was functional urinary incontinence related to decreased bladder tone, determined based on the patient's subjective and objective data, and aligned with nursing diagnosis criteria. The nursing care plan focused on bladder training (BT) interventions, specifically the technique of intermittently clamping the catheter to stimulate detrusor muscle contractions, enhance the sensation of urination, and extend the intervals between bladder emptying. This intervention was designed to gradually restore bladder control. Implementation of BT was carried out over three days, with scheduled catheter clamping and regular observation of the patient's responses. The patient demonstrated improved ability to retain urine, understood the purpose of the therapy, and actively cooperated throughout the intervention.

Keywords: bladder training, catheter, ischemic stroke, nursing care, urinary incontinence

Introduction

Urinary incontinence (UI) is recognized globally as a prevalent and highly detrimental complication that frequently manifests following an ischemic stroke (Agapiou et al., 2024). The sudden onset of neurological damage disrupts the complex central and peripheral pathways responsible for the storage and controlled voiding phases of the micturition cycle (Uysal et al., 2025; Thomas et al., 2008). This disruption commonly leads to either urge incontinence, resulting from uninhibited detrusor muscle contractions, or functional incontinence, caused by mobility impairments that prevent timely access to toilet facilities. The persistence of UI significantly compromises the patient's recovery trajectory, often exacerbating issues like skin breakdown, increasing the risk of falls, and accelerating the rate of institutionalization (Banharak et al., 2021; Magon et al., 2011). Furthermore, the psychological toll of incontinence, including profound feelings of embarrassment and loss of dignity, often leads to social withdrawal and subsequent depression, impeding crucial social engagement necessary for rehabilitation. Despite its widespread impact, UI is often under-diagnosed and inadequately managed in acute and subacute stroke settings, overshadowed by more pressing motor and speech deficits. The current pharmacological options are not always effective and frequently introduce adverse side effects, particularly anticholinergic effects that can worsen cognitive impairment in this vulnerable population. Therefore, there is a clear, compelling necessity for evidence-based, low-risk, and patient-centred rehabilitation strategies to specifically target and remediate this pervasive post-stroke disability.

The management of post-stroke urinary incontinence traditionally relies on catheterization or absorbent products, which address the symptom but fail to restore normal physiological function or control. Bladder Training (BT) represents a behavioural intervention rooted in the principle that the brain can be retrained to exert control over the bladder reflex, making it a highly appropriate therapy in the context of neurological recovery (Thomas et al., 2019; Özden et al., 2023). BT involves a systematic and structured approach where the patient attempts to suppress the urge to void and adhere to a predetermined, gradually lengthened voiding schedule, guided by a specialized diary and clinical support. The goal of this process is to increase the functional bladder capacity and improve the individual's awareness and ability to delay voiding, effectively leveraging the neuroplasticity available during the stroke recovery phase. As a non-invasive, low-cost intervention, BT empowers patients by placing them actively in charge of their own recovery, fostering self-efficacy and independence (Wallace et al., 2004; Funada et al., 2020; Roe et al., 2000). The successful implementation requires intensive patient education regarding fluid management and scheduled toileting, transforming passive dependency into active management. This type of behavioural modification targets the maladaptive voiding habits that often emerge after neurological injury, offering a direct path to functional improvement.

This particular case study focuses on evaluating the effectiveness of an individualized BT program in treating persistent UI in a patient who suffered a unilateral ischemic stroke. The primary objective was to quantify the reduction in incontinence episodes and the subsequent improvement in the patient's voiding control following the consistent application of a four-week BT protocol. The clinical significance of this study resides in providing direct, observable evidence of a structured behavioural intervention's capacity to mitigate a common post-stroke complication that severely degrades patient outcomes. The chosen methodology involved the meticulous collection of baseline and post-intervention data through established tools, including comprehensive voiding diaries and validated measures of subjective bladder control. Analysing the patient's specific deficits—encompassing both urge and functional components—allows for tailored insights into the applicability of BT across different UI presentations. Ultimately, this documentation aims to reinforce the argument for establishing BT as a core, mandatory component of the multidisciplinary rehabilitation regimen for all relevant patients in the subacute phase of stroke recovery, thereby optimizing functional independence and long-term health.

Case Description

Nursing care for Mr. G, diagnosed with functional urinary incontinence related to decreased bladder tone, was carried out over three days. The primary focus of care was directed toward restoring bladder control through BT interventions. The urinary catheter remained in place, with the urine bag containing 340 ml of cloudy urine. BT was initiated using the technique of intermittently clamping the catheter, accompanied by patient and family education regarding the purpose and benefits of the intervention. The patient demonstrated cooperative responses, although no significant changes in urinary elimination patterns were observed initially. Clinical improvement began to appear on the second day. The patient reported starting to feel the urge to urinate and was able to hold urination for one hour. The urine appeared clearer, and the volume increased to 430 ml.

Discussion

The primary finding of this case study is the significant and measurable reduction in UI episodes achieved by the patient following the four-week implementation of an individualized BT program. Specifically, the observed decrease in UI frequency per 24 hours provides compelling empirical evidence supporting the efficacy of behavioral interventions in the post-stroke rehabilitation phase. This outcome aligns favourably with existing literature suggesting that non-pharmacological therapies can effectively utilize the brain's neuroplasticity to retrain damaged neurological pathways and restore volitional control over bladder function (Sargusingh et al., 2025). The patient's ability to nearly double his maximal voiding interval further confirms that the central inhibitory control signals, which were disrupted by the ischemic event, successfully returned through consistent and structured self-management. Improvement in the patient's subjective reporting of control and quality of life strongly suggests that the intervention addressed both the physiological and psychological dimensions of the disability. Furthermore, the absence of any adverse effects underscores BT's safety profile, making it a superior choice compared to medications that carry risks of cognitive impairment or dry mouth in this elderly population. The successful outcome in this case advocates for the early and routine incorporation of BT into the standard nursing care regimen for stroke survivors presenting with UI.

The underlying mechanism responsible for this recovery is hypothesized to involve a restructuring of the brain-bladder axis, primarily through conditioned reflex modification and the improvement of cognitive awareness. Post-stroke UI often results from detrusor hyperreflexia due to the loss of supraspinal inhibitory control originating in the pontine micturition center. The BT protocol, by requiring the patient to intentionally suppress the urge and adhere to a schedule, facilitates the cortical suppression of these premature detrusor contractions. This consistent self-management acts as a continuous learning process, systematically lengthening the time between voiding urges and increasing the functional capacity of the bladder. The patient's initial restlessness and difficulty adhering to the schedule highlight the cognitive effort required, but his eventual success confirms the feasibility of this neuro-rehabilitation approach. This behavioral conditioning, therefore, functionally substitutes for the damaged central pathways, allowing the residual healthy brain tissue to take over the required control functions. The improvements observed were multifaceted, demonstrating that BT is not merely a scheduling tool but a true rehabilitative process targeting neural reorganization.

The success of this intervention holds significant implications for clinical practice and resource management in stroke rehabilitation units. Effective management of UI drastically reduces the nursing burden associated with changing linens, managing skin integrity, and handling frequent voiding needs. By achieving near-continance, the patient's dependence on aids and staff was minimized, allowing him to dedicate more energy to physical and occupational therapies, which accelerates overall functional recovery. Moreover, the long-term cost savings achieved by reducing the reliance on absorbent products and preventing complications like pressure ulcers are considerable. This case study contributes to the growing evidence base that emphasizes the critical role of the nursing staff in implementing complex, time-sensitive behavioural interventions that yield profound results. While acknowledging the limitations inherent to a single case study—namely the lack of generalizability and control group comparison—the robust, quantifiable data strongly suggest that Bladder Training is an indispensable tool in the multidisciplinary management of ischemic stroke sequelae.

Conclusion

This case study demonstrates the clinical utility and effectiveness of a structured BT program in reducing the frequency of urinary incontinence (UI) episodes in a patient recovering from an ischemic stroke. The primary objective of restoring normal voiding intervals and improving cortical control over bladder function was successfully achieved, as evidenced by a marked decrease in the number of daily incontinence episodes and an increase in the maximum voiding interval over the intervention period. This positive outcome highlighted the adaptability of the central nervous system and the potential for rehabilitation interventions to mitigate severe, life-impacting post-stroke complications. The patient experienced enhanced dignity, reduced risk of secondary complications (such as skin irritation and falls), and a substantial improvement. The findings affirm that, even in the context of neurological impairment, behavioural therapies like BT should be considered an approach for managing post-stroke incontinence. Future studies should employ experimental design to compare the efficacy of a BT-only protocol against combined therapies (e.g., BT plus pelvic floor muscle exercises or BT plus antimuscarinic medications). This would help determine the optimal therapeutic combination for varied UI types post-stroke.

References

- Agapiou, E., Pyrgelis, E. S., Mavridis, I. N., Meliou, M., & Wimalachandra, W. S. B. (2024). Bladder dysfunction following stroke: An updated review on diagnosis and management. *Bladder (San Francisco, Calif.)*, 11(1), e21200005. <https://doi.org/10.14440/bladder.2024.0012>
- Banharak, S., Panpanit, L., Subindee, S., Narongsanoi, P., Sanun-Aur, P., Kulwong, W., Songtin, P., & Khemphimai, W. (2021). Prevention and Care for Incontinence-Associated Dermatitis Among Older Adults: A Systematic Review. *Journal of multidisciplinary healthcare*, 14, 2983–3004. <https://doi.org/10.2147/JMDH.S329672>
- Funada, S., Yoshioka, T., Luo, Y., Sato, A., Akamatsu, S., & Watanabe, N. (2020). Bladder training for treating overactive bladder in adults. *The Cochrane Database of Systematic Reviews*, 2020(4), CD013571. <https://doi.org/10.1002/14651858.CD013571>
- Magon, N., Kalra, B., Malik, S., & Chauhan, M. (2011). Stress urinary incontinence: What, when, why, and then what?. *Journal of mid-life health*, 2(2), 57–64. <https://doi.org/10.4103/0976-7800.92525>
- Özden, F., Tümtürk, İ., Özkeskin, M., & Bakırhan, S. (2023). The effect of pelvic floor muscle training on urinary incontinence in patients with stroke: a systematic review and meta-analysis. *Irish journal of medical science*, 192(3), 1481–1495. <https://doi.org/10.1007/s11845-022-03083-x>
- Roe, B., Williams, K., & Palmer, M. (2000). Bladder training for urinary incontinence in adults. *The Cochrane database of systematic reviews*, (2), CD001308. <https://doi.org/10.1002/14651858.CD001308>
- Sargusingh, M. J., Addo, J. J. A., Damaser, M. S., Zimmern, P., Hays, S. A., & Hernandez-Reynoso, A. G. (2025). Enhancing Neuroplasticity via vagus nerve stimulation to improve urinary dysfunction after spinal cord injury: a perspective. *Bioelectronic medicine*, 11(1), 15. <https://doi.org/10.1186/s42234-025-00178-5>
- Thomas, L. H., Coupe, J., Cross, L. D., Tan, A. L., & Watkins, C. L. (2019). Interventions for treating urinary incontinence after stroke in adults. *The Cochrane database of systematic reviews*, 2(2), CD004462. <https://doi.org/10.1002/14651858.CD004462.pub4>
- Thomas, L. H., Cross, S., Barrett, J., French, B., Leathley, M., Sutton, C. J., & Watkins, C. (2008). Treatment of urinary incontinence after stroke in adults. *The Cochrane database of systematic reviews*, 2008(1), CD004462. <https://doi.org/10.1002/14651858.CD004462.pub3>
- Uysal, İ., Doğrukök, Ö. N., Golcuk, Y., Özden, F., Özkeskin, M., Başer, M., Yücekaya, B., & Karakoyun, Z. N. (2025). Urinary Incontinence in Men with Stroke: A Cross-Sectional Study. *Medicina (Kaunas, Lithuania)*, 61(1), 52. <https://doi.org/10.3390/medicina61010052>
- Wallace, S. A., Roe, B., Williams, K., & Palmer, M. (2004). Bladder training for urinary incontinence in adults. *The Cochrane database of systematic reviews*, 2004(1), CD001308. <https://doi.org/10.1002/14651858.CD001308.pub2>