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A Nurse-led Bladder Protocol in Reducing the Incidence of Urinary Retention and Number of Catheterization in Acute Stroke Patients

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Background of the problem

Urinary retention is a common complication of acute stroke. It leads to indwelling urinary catheterization, which cause discomfort, potential urethral trauma and a higher risk of urinary tract infection. These could prolonged patients' length of hospitalization. Catheter-associated urinary tract infection (CAUTI) is the leading cause of secondary health care-associated bacteremia which accounts for 30-40% of all health care-acquired infections. Up to 80% of these infections are related with the use of indwelling urinary catheters. The incident rate of CAUTI at SGH Inpatient Rehabilitation Unit at BVH was 10.6 per 1,000 device day (August 2016) and the target was <4 per 1,000 device day.

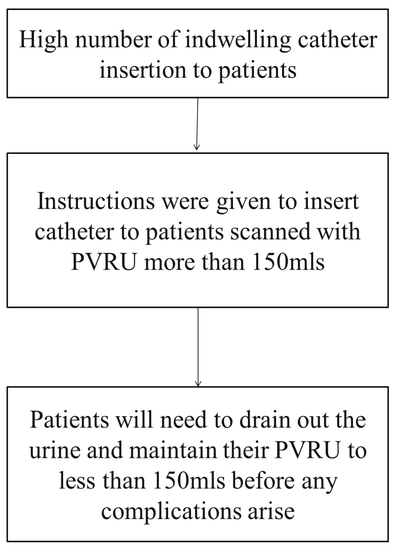
Nurses at the SGH Inpatient Rehabilitation Unit at BVH screen all patients with stroke for urinary retention using a bladder scan as part of the practice protocol. For patients with post void residual urine (PVRU) of more than 150mls, insertion of indwelling catheter is usually be considered as part of the care to prevent further medical complications.

Based on the data collection from April 2016 to October 2016, a total of 29 patients had post void residual urine (PVRU) more than 150mls and 58.7% (17/29) patients require indwelling catheter insertion.

Mission Statement

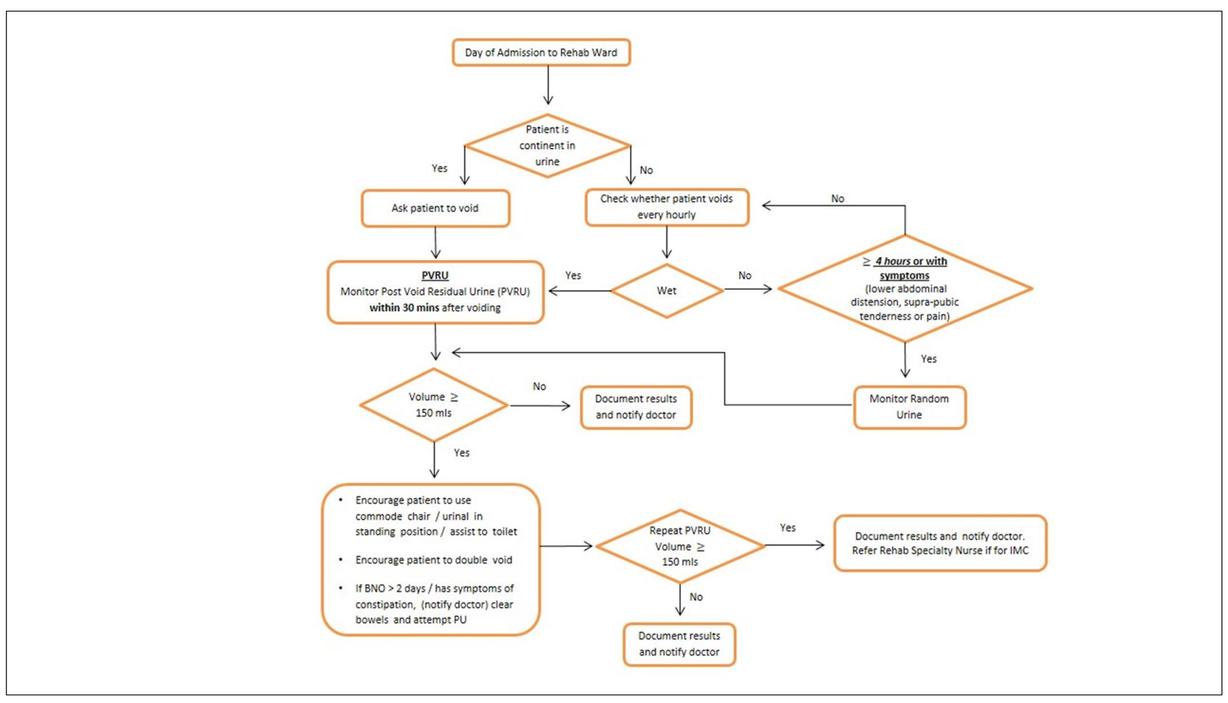
The project aim is to reduce the incidence of urinary retention and number of catheterization in acute stroke patients at the SGH Rehabilitation Unit at BVH.

Analysis of problem



Interventions / Initiatives

Instead of inserting the catheter immediately once patient exceed PVRU of more than 150ml, the team developed a nurse-led urinary retention screening protocol. Registered nurses (RN) were empowered to make the independent assessments and interventions for stroke patients (refer figure 1)



RN will screen all patients with stroke (to exclude patients with existing urinary catheter) for urinary retention using bladder scan upon their admission to SGH inpatient rehabilitation ward at BVH. They measure patient's PVRU within 30 minutes after voiding. If patient's bladder volume is more than 150mls, nurses will carry out nurse-led interventions in the following order

1. Assist patient to void in the toilet. If patient is unable to mobilize to the toilet, to assist patient to use commode chair or to stand and void using urinal.
2. Teach and encourage patient to perform double voiding.
3. Check patient's bowel movement. If patient BNO for ≥2 days or has symptoms of constipation such as straining, passing of hard stools, sensation of incomplete evacuations bowel, to notify doctors and assist to clear patient's bowels.
4. Repeat bladder scan after patient has voided and notify doctor of results.

Results

From October 2016 to June 2017, there were 31 patients with PVRU more than 150mls. After nurse-led bladder protocol interventions, **61.3% (19/31)** of patients PVRU improved (refer figure 2). Only **29% (7/31)** of patients required indwelling urinary catheterization, which showed significant improvement compared to pre-implementation group 58.7% (17/29) (p=0.02) (refer figure 3). In additional, the CAUTI rate has also decreased from **18.9 to 16.8** per 1,000 device day over 9 months (refer figure 4). This project saved us a total of **31 man –hours** and **$2,408.88** over 9 months (refer figure 5).

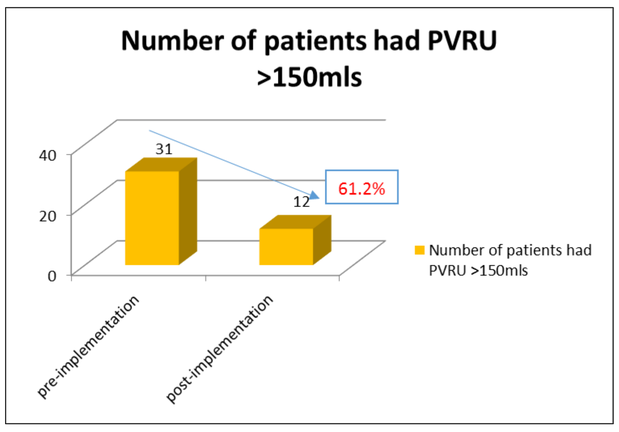


Figure 2 : Number of patient with PVRU >150mls before and after nursing-led intervention

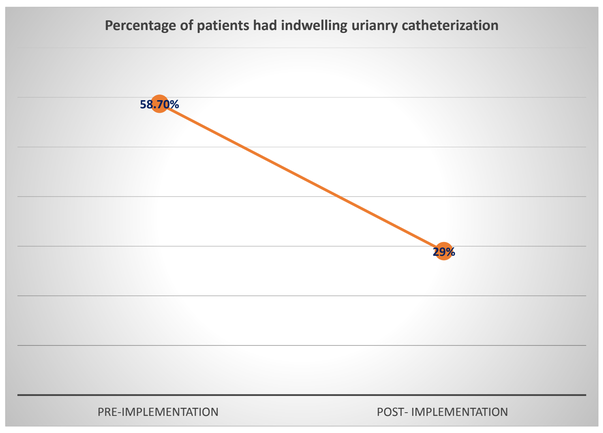


Figure 3 : Percentage of patient had indwelling urinary catheterization before and after nursing-led intervention

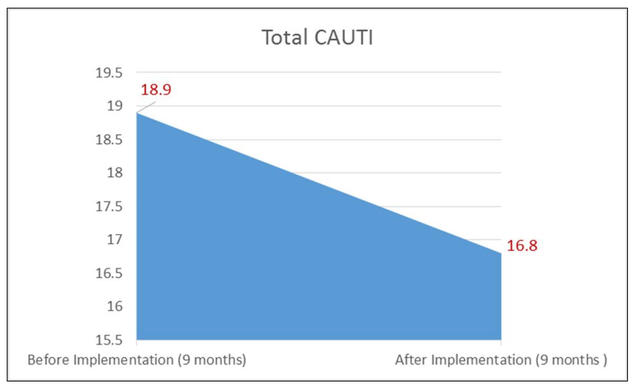


Figure 4: CAUTI rate per 1,000 device day before and after nursing-led intervention

Subject	Each indwelling urinary catheterization	Total reduction
Time of nursing staff (phone consult)	15 min	31(cases)x15 min= **465 min**
Time of medical staff (procedure of catherization)	60 min	24(case)x60 min= **1440 min**
Cost of procedure	$100.37	24 (cases) x$100.37= **$2,408.88**

Figure 4: Total man hours and cost saving over 9 months

Sustainability Plans and Follow Up

This nurse-led bladder protocol has been incorporated into the stroke inpatient rehabilitation Coordinated Clinical Pathways. The team is also conducting periodical audit to ensure compliance in the daily use of the protocol, providing feedback and clarification as required. In view of the good outcome, we planned to implement this protocol to acute stroke unit in SGH and other groups of patients (e.g. the spinal cord injury and amputees, etc.) who are undergoing inpatient rehabilitation at SGH.