Impact of a Catheter-associated Urinary Tract Infection (CAUTI) Education Package on Nurses’ Knowledge, Attitude and Indwelling Catheter Management Practices

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• LEARNER OBJECTIVE: The learner will be able to describe the impact of multi-faceted catheter-associated urinary tract infection prevention measures on nurses’ knowledge, attitude and catheter management practices

• CONFLICT of INTEREST: None

• EMPLOYER: Counties Manukau District Health Board

• SPONSORSHIP: None
In the US, 36-40% of HAIs are due to CAUTI (MOST COMMON HAI)

80% of these HAIs are due to IDCs

With the IDC in place, the DAILY bacteriuria risk is about 3 to 7%

With the IDC in for a WEEK, bacteriuria risk increases to 25%

At one MONTH, bacteriuria risk is nearly 100%

3% will further develop bacteraemia – which has 10% mortality

Among those with bacteriuria, 10% will develop UTI symptoms; this will lead to excess length of stay of 2-4 days

Source: SHEA/IDSA, 2008; IHI, 2011
Each CAUTI event costs around US$500 - $700, thereby annually costing the US $424-451M

With bacteraemia secondary to CAUTI, the cost increases to $2,500 - $3,000 per case

In the UK, each CAUTI event costs around £1,968 (Ward, Fenton & Mayer, 2010)

Annual cost for the UK National Health Service - £99 million (Davenport & Keeley, 2005)
• Need to complete surveillance data
Objectives:

1. To identify staff nurses' current knowledge, attitudes and indwelling catheter management practices

2. To implement a CAUTI education package on two surgical wards

3. To determine if a significant difference exists in the staff nurses' indwelling catheter management practices before and after the introduction of a CAUTI education package
Research Question:
What is the impact of a CAUTI education package on the knowledge, attitude and indwelling catheter management practices of nurses?
**Design:** Mixed methods approach

**Setting:** Two surgical wards of a tertiary hospital in Auckland, New Zealand

**Participants:** Convenience sample of staff nurses (n=27)
- Invitation through e-mail
- Additional information through flyers
- Participation was voluntary, with utmost respect for human dignity and autonomy
Methods:

• First phase: utilised focus group discussions to gather baseline data
• Second phase: implementation of education sessions; pre-test and post-test
• Third phase: utilised evidence-based checklists; document analysis
Focus Group Discussion (FGD) FINDINGS

- FGD done twice, n=13

- Key themes:
  - Preparation for catheter management – diversity both in undergraduate training and training while on the job
  - Nursing skills and knowledge – task-oriented IDC care; misconceptions
  - Current clinical practice – collaborative; gender-based; ethical dilemma
  - Catheter management resources – awareness of, access to and use of policies and guidelines
FGD FINDINGS – SOME CONCERNS

- practice of putting the catheter bag on an incontinence pad that lines the floor
- variation in keeping the catheter in place; some practices may put patients at risk of impaired skin integrity
- others do not secure the catheter to the patients’ legs
Pre and Post Test

Questions were grouped into the FOUR COMPONENTS of CAUTI PREVENTION:

Four components of care to prevent or reduce CAUTI:

- Avoid unnecessary urinary catheters
- Insert urinary catheters using aseptic technique
- Maintain urinary catheters based on recommended guidelines
- Review urinary catheter necessity daily and remove promptly
paired t-test to test for a significant difference in the overall score

there is a significant difference ($p < 0.0001$) in the overall score between the pre and post-test, with a mean difference of 6.64 and 95% CI of (4.96, 8.33)

Table 1. Mean and standard deviation of overall score in the pre and post-test
### Education Session FINDINGS

Table 2. Descriptive summary of the four components of the pre and post-test

<table>
<thead>
<tr>
<th>Components</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background knowledge</td>
<td>0.0001</td>
</tr>
<tr>
<td>Catheter Insertion</td>
<td>0.0234</td>
</tr>
<tr>
<td>Catheter Maintenance</td>
<td>0.0005</td>
</tr>
<tr>
<td>Catheter Removal</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Note: Non-parametric test was used (Wilcoxon Signed Rank-test) was used to determine if there is a significant difference in the scores as the data was found to be not normally distributed.

Significant difference in the pre and post test scores in the four components.
USE of CHECKLISTS

• 175 checklists collected within 15-week data gathering period

• 163 (93%) of post-surgery patients came to the ward with indwelling catheters

• Catheter maintenance checklists served as procedure prompts for nurses and improved documentation of care

Daily Urinary Catheter Maintenance Checklist

Components of Care to Prevent Catheter-associated Urinary Tract Infection (CAUTI)

<table>
<thead>
<tr>
<th>Appropriate Catheter Indications</th>
<th>YES</th>
<th>NO</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient meets at least one of appropriate catheter indications*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Hand Hygiene |
|----------------------------------|-----|----|----------------|
| Hand hygiene before catheter insertion |
| Hand hygiene after catheter insertion |
| Hand hygiene before catheter manipulation |
| Hand hygiene after catheter manipulation |

| Insertion Technique |
|----------------------------------|-----|----|----------------|
| Use sterile equipment including sterile gloves, drape, sponges and antiseptic solution |
| Use aseptic technique to insert catheter. If aseptic technique is broken, replace catheter and collecting bag with sterile equipment |
| Use single-use packet of lubricant jelly for insertion |
| Secure catheter to prevent movement and urethral traction |

| Catheter Maintenance |
|----------------------------------|-----|----|----------------|
| Collecting bag below level of bladder at all times |
| Tubing checked frequently for kinking |
| Urine collecting bag off the floor at all times |
| Closed-drainage system maintained |
| Urine collecting bag emptied regularly |
| Used separate clean urine collecting jug for each patient |
| Contact of drainage spigot with collecting jug is avoided when collecting urine |
| Routine hygiene, i.e. cleansing of perineal area done during daily bathing or showering |

| Catheter Removal |
|----------------------------------|-----|----|----------------|
| Catheter need assessed daily |
| Standard precaution used during catheter removal |
| Catheter removed Date removed: Removed by: Signature |

* Appropriate catheter indications: acute urinary retention or urinary obstruction, accurate urine output measurement is critically ill patients, prolonged immobilisation required, to assist in healing of open surgical or perineal wounds, end of life care, perioperative use for selected surgical procedures, e.g. for urologic surgery or surgery of adjoining structures, surgical procedure > 3 hours, intra-operative monitoring of urine output, and intra-operative administration of large-volume infusions or diuretics
The CAUTI education package that focused on four components of catheter care had a significant impact on the nurse’s knowledge. While various factors affect catheter management practices, enhanced training will not only improve nurses’ knowledge, but their practices as well.
RESEARCH RECOMMENDATIONS

• CAUTI Surveillance
• Evidence-based policies, procedures and guidelines
• Implementation of a CAUTI Prevention Bundle
• Staff education - curriculum development, regular updates for staff
• Procurement of products – stabilise/secure catheter to the patient’s bed; bladder scanner
• Workflow reminders – visual reminders, algorithms for decision-making
Proposed CAUTI BUNDLE

- Appropriate Indications for Catheter Insertion
- Proper Techniques for Catheter Insertion
- Daily Catheter Review and Prompt Removal
- Evidence-based Catheter Maintenance Practices
REFERENCES


