Driving CAUTI Rates to ZERO

Nada Nassar, BSN, MSN
Nurse Quality Manager-AUBMC
Outline

I. Background:
   1. Impact of CAUTI
   2. Urinary Catheter Use

II. FOCUS PI tool for CAUTI
   1. Find the problem
   2. Organize a team
   3. Clarify existing knowledge
   4. Understand the cause of variation
   5. Select a process to improve
III. PDCA PI tool for CAUTI
   1. Plan improvement steps
   2. Do: implement approved plan
   3. Check
   4. Act

IV. References
Background: Impact of CAUTI

- Most common type of healthcare-associated infection
  - > 30% of HAIs reported to National Healthcare Safety Network (NHSN)
  - Estimated > 560,000 nosocomial UTIs annually

- Increased morbidity & mortality
  - Estimated 13,000 attributable deaths annually
  - Leading cause of secondary BSI with ~10% mortality

- Excess length of stay – 2-4 days
- Increased cost – $0.4-0.5 billion per year- US level
- Unnecessary antimicrobial use
Background: Urinary Catheter Use

• 15-25% of hospitalized patients

• Often placed for inappropriate indications

• In a recent survey of U.S. hospitals:
  – > 50% did not monitor which patients are catheterized
  – 75% did not monitor duration and/or discontinuation of the indwelling catheter
FOCUS PDCA PI tool

1. Find a process that needs improvement
2. Organize a team who understands the process
3. Clarify the current knowledge of the process
4. Uncover the root causes of variation
5. Select a process improvement
FOCUS PDCA PI tool

Plan:
- Establishment of the objectives and processes.
- Develop a working hypothesis for any problem.
- Develop a proposed solution for the same.

Do:
- The proposed solution is implemented.

Check:
- Monitoring measurement of processes and product, and reporting the results.
- Detailed study done on the results of the solution implemented.
- Check if the proposed solution achieved the desired result.

Act:
- Actions to continually improve process performance.
- Interpretation of the check on results.
- If problem was solved then, changes done to incorporate the new way of doing business.
Finding the Problem

• In the American University of Beirut Medical Center (AUBMC), CAUTI is considered one of the Nursing Quality Indicators measured on quarterly basis and benchmarked with National Database of Nursing Quality Indicators (NDNQI).

• Our CAUTI numbers were on the rise
Organize the team

- A team from the nursing quality council volunteered to work on the performance improvement project.

- The members were from the medical surgical, oncology, critical, emergency department and operating room.
We started with the present policy titled "Indwelling Urinary Catheter: Placement, Care, and Removal; and Intermittent Catheterization for Females_1013" that is considered a resource to the health care members in the institution.

**Clarify existing knowledge**

**CAUTION US Bundle**

<table>
<thead>
<tr>
<th>CAUTION US</th>
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<tbody>
<tr>
<td><strong>C</strong></td>
<td>Keep closed system at all times (IB). Consider pre-connected, sealed catheter-tubing junctions if available (IB).</td>
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<tr>
<td><strong>A</strong></td>
<td>Aseptic technique &amp; sterile equipment during catheter insertion and intermittent catheterization (IB). Wash hands before &amp; after insertion &amp; handling of device or site (IB). Perform peri-urethral cleaning with antiseptic or sterile solution prior to insertion (IB). If breaks in aseptic technique, disconnection, or leakage occur, replace the catheter and collection system (IB).</td>
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<td><strong>U</strong></td>
<td>Assure unobstructed urine flow (IB), no kinks (IB), collection bag below bladder level (IB) &amp; not touching the floor (IB), empty urine bag in a clean manner using clean container and avoid contact of the drainage spigot with the container (IB); secure catheter (IB).</td>
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<td><strong>T</strong></td>
<td>Train professionals for inserting &amp; handling the catheter (IB).</td>
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<tr>
<td><strong>I</strong></td>
<td>Insert catheters only for appropriate indications * and leave in place only as long as needed (IB) Consider using alternatives to chronic urinary catheters in selected patients ** (II) If intermittent catheterization is used, perform it at regular intervals (IB).</td>
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<tr>
<td><strong>O</strong></td>
<td>Obtain urine samples aseptically (IB).</td>
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<td><strong>N</strong></td>
<td>Assess the need for continued catheterization on daily basis. Establish nurse-driven protocols for removal of unnecessary catheters (IB).</td>
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<td><strong>U</strong></td>
<td>Use smallest catheter size possible (II).</td>
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<tr>
<td><strong>S</strong></td>
<td>Secure catheter after insertion to prevent movement and urethral traction (IB). Scan bladder to assess urine volume in intermittently catheterized patients and prevent re-catheterization (II). If scanners are used, ensure staff are trained and equipment is adequately disinfected (IB).</td>
</tr>
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</table>
The taskforce started by conducting several brainstorming sessions and the members were able to conclude the following:

- The current Indwelling Urinary Catheter policy at AUBMC is effective. It is evidence-based and relies on the latest researches from CDC and other best practices.
- Some staff lack the needed knowledge of the policy and the bundle.
- Some staff are non-compliant with the policy.
3. The task team conducted extensive literature review summarized in the following:

- The duration of catheterization is the most important risk factor for developing infection. Thus, reducing unnecessary catheter placement and minimizing the duration of the catheter remain the primary strategies for CAUTI prevention.
- Additional risk factors include old age, female sex, and not maintaining a closed drainage system.
- Other comorbidities like neutropenia, renal disease act as risk factors for developing CAUTI.

Lo, E. (2014)
Cope and Gentry (2005) identified that catheterization longer than six days is a high risk factor for CAUTI as the risk increases by 7 folds after that period. In that same research article, they alleged that having been catheterized for almost 30 days increases the risk of CAUTI to almost 100%.

Elpern et al. (2009), found that limiting the use of indwelling urinary catheters and their timely removal when indications are no longer available proved to be vital as the number of catheter-associated urinary tract infections per 1000 catheter days decreased from 4.7/month down to a zero during a six month period after the intervention was carried out.
A meta-analysis by Bernard, Hunter, and Moore (2012) found that when nurses reminded physicians to reassess the need for indwelling urinary catheters, CAUTI rates decreased from a 21.5 infections per 1000 catheter days to 5.2 infections per 1000 catheter days.

Lo.E et al (2014) stated that the components of an efficient CAUTI prevention program are:
- Decreasing catheter use through restricted indications for placement or duration of catheterization
- Decreased catheter use from 18.1% to 13.8%.

Clarify existing knowledge

Cont’d
Clarify existing knowledge

• Having a restrictive urinary catheter policy together with daily review of necessity and discussion of appropriateness of new catheter insertions decreased catheterization from 17.5% to 6.6% of patients

• Educating clinicians about appropriate urinary catheter indications in addition to daily assessment of continued catheter need during nursing rounds

• Introducing a CAUTI bundle in a single-center neurologic ICU significantly decreased catheter utilization from 100% to 73% and CAUTI from 13.3 to 4.1 per 1000 catheter days
Understand the cause of process variation

• Based on the brainstorming sessions’ findings, the task team conducted several clinical reviews during which staff compliance with the available CAUTI bundle was evaluated.

• The first review was an observational one during which all catheterized patients who were available in the medical center were screened using a home driven data collection tool.
Understand the cause of process variation

The observational round showed the following:

a. Low rates regarding indication of urinary catheterization
b. Low rates of compliance with the bundle
c. Urinary catheters stayed with no appropriate indication
Understand the cause of process variation

Patient Related
- Secondary Infection
- Female gender
- Immunosuppression
- Colonization
- Incomplete bladder emptying
- Other comorbidities
- Elderly patients
- Fecal Incontinence
- Recurrent UTI
- Diabetes
- Dehydration
- Poor personal hygiene

Caregiver Related
- Inaccurate documentation of interventions
- Insertion date not entered/updated on AS400 on time in all units
- Improper insertion (contamination, poor technique, incompetent staff)
- No Perineal Care before insertion
- Drainage tube, spigot, or bag contaminated upon handling
- Insertion date not entered at all in OR & PACU
- Contact time of disinfectant not respected
- No Perineal Care before insertion
- No daily assessments for necessity
- Improper selection of catheter type/size
- Improper storage of catheters and supplies
- No nurse driven protocol for catheter removal
- No catheter removal upon leaving OR
- Catheter days cannot be inserted to the system in ED
- Breaks in closed system
- Indications for catheterization not followed as specified in the bundle
- Drainage bag not emptied on time
- Poor hand hygiene
- Catheter not secured to body
- Drainage bag raised above bladder level upon transfer/positioning
- Drainage bag tube without clamp
- Drainage bags can't be hung on some IV poles
- Drainage bag replaced by urimeter for critical patients and vice versa for noncritical patients

Policy

Equipment

CAUTI

Cont’d
Select a Process for Improvement

- We selected the process where most problems were identified.

- The fish bone is the tool we selected to uncover the underlying causes.

- According to our fish bone done the improvements have to target the caregivers (Nurses at all levels and Medical Doctors).
## Plan

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Performed by</th>
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<tbody>
<tr>
<td>Recruit CAUTI champions from all units</td>
<td>Quality Council chair</td>
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<tr>
<td>Plan for a CAUTI half day (to include game booth asking about Urinary Catheter policy and practice, Simulation Lab for urinary catheter insertion, care and handling, videotaping a fun video with the ideal urinary catheter insertion, care and handling to be sent to all the staff) with the CPDC to revalidate policy competency and introduce the PI to all Nursing staff</td>
<td>CAUTI champions will coordinate with CPDC</td>
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<td>Prepare a posters with indications for urinary catheter insertion to be posted on all units</td>
<td>CAUTI champions</td>
</tr>
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<td>Emphasize compliance with the current policy specifically having indication for urinary catheter insertion</td>
<td>A pre-printed order set (Indwelling Urinary Catheter Order Set appendix 2) was formulated by the task team members with the indications for insertion as a mandatory field. The order set will be introduced to the MDs and RNs</td>
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<tr>
<td>Introduce the daily reminder/removal order set to the MDs and RNs in order to minimize the risk of CAUTI due to unnecessary catheterization</td>
<td>A pre-printed order set Indwelling Urinary Catheter Daily Reminder/Removal-Order Set (appendix 3) was formulated by the CAUTI task team</td>
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<tr>
<td>Perform CAUTI surveillance on quarterly utilizing the CAUTI surveillance tool</td>
<td>CAUTI champions will identify one day per quarter and audit all patients with urinary catheter using the CAUTI surveillance tool (point prevalence). Results will be shared with DON, Nurse Leaders for Clinical Affairs and NMs.</td>
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<td>Introduce new drainage bags and tubes that have clamps</td>
<td>The new equipment was already sent for trial and approval</td>
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<tr>
<td>Perform patient education regarding indwelling urinary catheter handling and prevention of CAUTI in the PTR form</td>
<td>All RNs will be instructed to educate patients/ family members, and document that on the patient teaching record form upon admission and as needed</td>
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The plan was approved by the director of Nursing, Medical Center Director and Chief of Staff
Do the taskforce chairperson recruited CAUTI champions from all nursing units.

A CAUTI workshop was prepared for the champions to increase their knowledge and awareness regarding the policy on Indwelling Urinary Catheters.

**Date and Time:** Wednesday, September 9, 2015 (1PM-3PM)

**Place:** American University of Beirut, Hamdy School of Nursing, 2nd floor, Room 218

**Target Audience:** AUBMC RNs selected as CAUTI champions from different nursing units

**Language:** English

**Purpose:** This workshop aims at providing selected AUBMC RNs with CAUTI prevention practices, while supporting their colleagues in abiding by the AUBMC policy on Indwelling Urinary Catheters.

**The objectives of this workshop are to:**

- List indications/contraindications for urinary catheterization
- Practice hands-on training on urinary catheters insertion and handling
- Modify improper urinary catheter practices

**Requirements for successful completion of the program:**

- Attend all the sessions included in the program outline and sign “Educational Activity Attendance Record.”
- Fill “Continuing Education Record: Personal Verification of Attendance”.
- Attend post-test and score a minimum of 80%.

**Contact Hours:** Participants will be awarded 1.2 contact hours.

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>1:00 pm-1:10 pm</td>
<td>Pre test</td>
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<tr>
<td>1:10 pm-1:40 pm</td>
<td>CAUTI Performance Improvement Project presentation</td>
<td>Ahmed Kaskas, BSN, TD, RN, Adult oncology Inpatient Unit, AUBMC</td>
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<tr>
<td>1:40 pm-2:50 pm</td>
<td>Hands-on Practice Station: Insertion and Handling of Indwelling Urinary Catheters</td>
<td>Nada Nassar, MSN, RN, Nurse Quality Manager, AUBMC</td>
</tr>
<tr>
<td>2:50 pm-3:00 pm</td>
<td>Post test</td>
<td>Lara Nemeh, MBA, RN, Nurse Quality Manager, AUBMC</td>
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<td></td>
<td>Shadi Halabi, BSN, RN, RCU, AUBMC</td>
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The planning committee and the presenter(s) declare no conflict of interest including financial interest in product or company, direct research support, or other form of potential bias.
The CAUTI champions prepared a one day workshop “CAUTI Awareness Day” for all the nurse at all levels.

The workshop was attended by 280 nurses at all levels.

It included a simulation of scenarios where the nurses had to identify wrong practices and a question and answer session.
### Indwelling Urinary Catheter: Order Set

**Identification label**

<table>
<thead>
<tr>
<th>Last Name:</th>
<th>First and Middle Name:</th>
<th>Unit:</th>
<th>Weight:</th>
<th>Expanded Precautions:</th>
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<tbody>
<tr>
<td></td>
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**Patient Number:**

**Date of Birth:**

<table>
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<tr>
<th>Gender:</th>
<th>Male</th>
<th>Female</th>
<th>Age:</th>
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**The following observations may not be used to document patient care:**

- Acute urinary retention
- Bladder outlet obstruction
- Need for accurate measurements of urinary output in critically ill patients or incontinent patients
- Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract
- Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)
- Patients anticipated receiving large-volume infusions or diuretics during surgery
- Need for intraoperative monitoring of urinary output
- To assist in healing of open surgical or perineal wounds in incontinent patients
- Prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)
- To improve comfort for end of life care if needed
- Initiate Indwelling Urinary Catheter Daily Reminder/Removal Order Set on daily basis till catheter is discontinued

**Nurse’s Name and Signature:**

**Time Noted:**

**MD Name:**

**Signature:**

**Fax or Scan to Pharmacy:**

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### Indwelling Urinary Catheter Daily Reminder/Removal Order Set

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- To assist in healing of open surgical or perineal wounds in incontinent patients
- Prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)
- To improve comfort for end of life care if needed

**MD Name:**

**Signature:**

**Time:**

**Foger Number:**

---
Do

• The pre-printed order sets were approved by the infection control program and medical records committee and are part of the chart (July, 2016)

• The Chief of Staff informed all the medical doctors on the order sets with a message to use them for all patients with indwelling catheters (July, 2016)
Do

• The CAUTI champions revalidated competency on the policy for all nursing staff.

• They introduced the order sets to the nurses and followed up on their proper usage. (July- August 2016)
Do

CAUTION US

CAUTI Prevention Bundle Loop

- Use smallest catheter size possible
- Add and remove the catheter days on AS400 on time
- Assess the need for permanent catheterization on daily basis
- Provide Reminder Order Set
- Obtain urine samples aseptically
- Insert catheters only for appropriate indications
- Train professionals for inserting & handling the catheter
- Keep closed system at all times
- Secure catheter after insertion
- Scan bladder to assess urine volume in intermittently catheterized patients to prevent re-catheterization
- Assure unobstructed urine flow
- Assure urine bag below bladder level & not touching the floor
- Empty urine bag in a clean container using clean container and avoid contact
- Aseptic technique & sterile equipment during catheter insertion
- Wash hands before & after insertion & handling of device or site
- Initiate indwelling catheter insertion order set

Nursing Quality Council

Initiate indwelling catheter insertion and reminder order set

Use AS400 to add and remove indwelling catheter days

STOP CAUTI

Cont’d
Check

• Improvements in the CAUTI rates started to show after the workshops took place.

• Initially CAUTI rates went down to ZERO in the medical surgical units

• Further efforts are put in ICU- patient co-morbidities is a challenge
### Indications for Insertion:
- 0-No indication listed
- 1-Acute urinary retention
- 2-Obstruction
- 3-Need for accurate I/O in critically ill patient
- 6-Periop in selected procedures:
  - (a) Urologic
  - (b) Anticipated prolonged surgery
  - (c) Urinary incontinence
  - (d) Patient receiving large-volume infusions or diuretic during surgery
- 7-Assist healing of stage III/IV ulcers
- 8-Improve comfort for end of life care (hospice/palliative care)
- 9-Prolonged immobilization/paralyzed/sedated patient

### Bag Label:
Insertion date, time, unit placed, and initials
References

References


• Spotlight on Success: Implementing Nurse-Driven Protocols to reduce CAUTIs. 2013 Joint Commission Resources

QUESTIONS