Breaking the Life Cycle of the Urinary Catheter

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The Goal

How low can you go? Aiming for ZERO!
Urinary Catheter Harm

- CAUTI
- Increased Length of Stay
- Trauma
- Immobility
- Pressure ulcers

Venous thromboembolism?

Falls?

Patient dignity*

*Saint S, Ann Intern Med 2002; 137: 125-7
1752 - Benjamin Franklin designed the first flexible UC made of bendy silver wire and covered with animal stomach casings for his brother John who suffered from kidney stones. Notably it allowed easy removal—being like a screw, it was “both withdrawn and introduc'd by turning.”

Hirschmann JV. Ann Intern Med 2005;143:830-834
A Brief History: The Urinary Catheter

June 1935 – F.E.B Foley, MD developed one of the first indwelling UCs. Patent however was awarded to Paul Raiche of the Davol Rubber Co. after legal disputes between Dr. Foley and Mr. Raiche.

Initial Evidence Supporting Closed Urinary Catheterization System
Potential Site for Contamination

Sterile technique must be used when inserting the catheter. Do not use aggressive cleaning once urinary catheter is in place.

Catheterout.org
Potential Site for Contamination

Sampling Port: Disinfect port before sampling urine. Also, check site for possible disconnection of catheter from drainage bag.
Potential Site for Contamination

System may become an open system if outlet is left hanging or is unclamped.
Closed System Urinary Catheter
Challenges to Maintaining Closed System

- Foley tray selection at time of insertion;
  - Locations; Emergency Dept., Surgery, No tray for pediatrics
- Features
  - Urimeter
  - Temperature sensing Foley
“Lifecycle” of the Urinary Catheter

1. Prevent Unnecessary and Improper Placement
2. Maintain Awareness and Proper Care of Catheters in Place
3. Prompt Catheter Removal
4. Prevent Catheter Replacement

### Appropriate Indications for Catheter Use

**Appropriate Indications**

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Patient has acute urinary retention or obstruction</td>
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<tr>
<td>Need for accurate measurements of urinary output in <em>critically ill</em> patients.</td>
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<tr>
<td>Perioperative use for selected procedures:</td>
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<tr>
<td>• urologic surgery or other surgery on contiguous structures of genitourinary tract,</td>
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<td>• anticipated prolonged surgery duration (removed in post-anesthesia unit),</td>
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<tr>
<td>• anticipated to receive large-volume infusions or diuretics in surgery,</td>
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<tr>
<td>• operative patients with urinary incontinence,</td>
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<tr>
<td>• need to intraoperative monitoring of urinary output.</td>
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<tr>
<td>To assist in healing of open sacral or perineal wounds in incontinent patients.</td>
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<tr>
<td>Requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine)</td>
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<tr>
<td>To improve comfort for end of life care if needed.</td>
</tr>
</tbody>
</table>

### Inappropriate Indications for Indwelling Urinary Catheter Use

<table>
<thead>
<tr>
<th>Inappropriate Indications</th>
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</thead>
<tbody>
<tr>
<td>As a substitute for nursing care of the patient or resident with incontinence</td>
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<tr>
<td>As a means of obtaining urine for culture or other diagnostic tests when the patient can voluntarily void</td>
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<tr>
<td>For prolonged postoperative duration without appropriate indications (e.g., structural repair of urethra or contiguous structures, prolonged effect of epidural anaesthesia, etc.)</td>
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<tr>
<td>Routinely for patients receiving epidural anesthesia/analgesia.</td>
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</tbody>
</table>

Inappropriate Catheter Placement

- Initial indication for catheter placement:\(^1\):

<table>
<thead>
<tr>
<th>Indication</th>
<th>MICU (N=135)</th>
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<th>Med Unit (N=67)</th>
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<tbody>
<tr>
<td></td>
<td>Justified %</td>
<td>Unjustified %</td>
<td>Justified %</td>
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<tr>
<td>Monitoring urine output</td>
<td>93</td>
<td>7</td>
<td>90 (17/19)</td>
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<tr>
<td>Urinary incontinence</td>
<td>0</td>
<td>0</td>
<td>20</td>
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<tr>
<td>Urinary retention</td>
<td>0</td>
<td>0</td>
<td>92</td>
</tr>
<tr>
<td>Periop/periprocedural</td>
<td>97</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>Unclear reason</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

Other Reasons and Risk of Urinary Catheters

**Other Reasons**
- Urine output monitoring outside the ICU
- Incontinence without skin breakdown/decubitus
- Prolonged post-operative use beyond 24 hours
- Transfer from ICU to floor
- Morbid obesity or immobility
- Confusion or dementia
- Patient request

**Other Risks**
- Secondary bacteremia, sepsis, metastatic infection
- “One-point restraint” = decreased mobility
  - DVT/PE, pressure ulcers
  - Fall risk by tripping over catheter
  - Deconditioning
- Patient discomfort, need to retrain bladder
Critically Ill Patients

- “A critically ill patient is one at imminent risk of death”

- How can we identify “critically ill” patients who are appropriate candidates for urinary catheterization?
Integration into Policies

- Patients anticipated to receive large volume infusions or diuretics during surgery.

IUCs should **not** be used:
- For perceived comfort in patients with urinary or fecal incontinence.
- As a means for obtaining urine for tests when patient can voluntary void.
- Prolonged postoperative use without appropriate indications.

**Note:** The presence of an epidural catheter is not an **absolute** indication for an IUC. Patients with greater than 0.1% Bupivacaine are at higher risk for urinary retention. Patients with a lumbar epidural that receive higher than usual concentrations of local anesthetic may require an IUC. If an IUC is required, remove IUC when epidural therapy is discontinued.
### Examples – Critical Care

<table>
<thead>
<tr>
<th>Conditions that require a Foley</th>
<th>Conditions that do not require a Foley</th>
<th>Case dependent conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis (first 24 hours)</td>
<td>MIV</td>
<td>ARDS</td>
</tr>
<tr>
<td>CRRT</td>
<td>Tube feeding</td>
<td>Paralysis or Sedation</td>
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<tr>
<td>ARF</td>
<td>Pressors with minimal titration</td>
<td></td>
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<tr>
<td>Pressors with titration</td>
<td>Lasix</td>
<td></td>
</tr>
<tr>
<td>Artic Sun</td>
<td>Mild sedation or drowsiness</td>
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<tr>
<td>IABP</td>
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<td>SAH with triple H therapy</td>
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<td></td>
</tr>
</tbody>
</table>

**Alternates to Foley**

- Incontinence Pad = P
- Condom Catheter = C
- Brief = B

Source: Chart and data created and published with permission Jamie Tuttle, Tucson Medical Center
Conversation at the Bedside

You say you need strict I and O monitoring for a critically ill patient:

• Are medications being adjusted based upon the Intake and Output?
• Can adequate measurement be obtained by other means? (weights, condom catheter, etc.)
• Is the patient able to get out of bed?
• If the patient develops a CAUTI, will you remove the catheter?
DOES YOUR PATIENT REALLY NEED A URINARY CATHETER?

INDICATIONS FOR URINARY CATHETER USE
(Remember C.H.O.R.U.S)

C = COMFORT
• Comfort Measures for the terminally ill
• Open sacral or perineal wounds in an incontinent patient

H = HEMODYNAMIC MONITORING
• Close monitoring of urinary output
• Aggressive treatment with diuretics or fluids

O = OBSTRUCTION
• Anatomic or physiologic outlet obstruction (enlarged prostate, blood clots, etc.)

R = RETENTION
Urinary retention not manageable by any other means

U = UROLOGIC
• Urologist or other physician placed urinary catheter, urologic studies, neurogenic bladder

S = SURGERY
• Urologic, gynecological or perineal surgeries
• Epidural Catheter in place
• Orthopedic fracture prior to repair

Source: APIC Implementation Guide 2014
Insertion Best Practices Issues

- Aseptic Technique
- Competency
- Insertion kits – hand hygiene, reduce risk of contamination
- 2 person insertions
“Lifecycle” of the Urinary Catheter

1. Prevent Unnecessary and Improper Placement
2. Maintain Awareness and Proper Care of Catheters in Place
3. Prompt Catheter Removal
4. Prevent Catheter Replacement

# Maintenance

<table>
<thead>
<tr>
<th>DATE</th>
<th>BUNDLE CRITERIA</th>
<th>ACTION REMOVE OR CONTINUE</th>
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<tr>
<td></td>
<td>DAILY DOCUMENTED ASSESSMENT OF NEED</td>
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<td></td>
<td>TAMPER EVIDENT SEAL IS INTACT</td>
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<td></td>
<td>CATHETER SECURED—SECUREMENT DEVICE IN PLACE</td>
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<td></td>
<td>HAND HYGIENE PERFORMED FOR PATIENT CONTACT</td>
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<td></td>
<td>DAILY MEATAL HYGIENE PERFORMED WITH SOAP AND WATER</td>
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<td>DRAINAGE BAG EMTIED USING A CLEAN CONTAINER</td>
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<td></td>
<td>UNOBB-STRUCTED FLOW MAINTAINED</td>
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<th>YES NO</th>
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<th>YES NO</th>
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<th>REMOVE CONTINUE</th>
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<td>REMOVE CONTINUE</td>
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Use with permission from: George Allen, PhD, CIC, CNOR, Downstate Medical Center, Brooklyn, NY
<table>
<thead>
<tr>
<th>UNIT NAME:</th>
<th>__________</th>
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<tbody>
<tr>
<td>DATE:</td>
<td>__________</td>
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<tr>
<td>Tucson Medical Center CAUTI PROJECT:</td>
<td>CATHETER APPROPRIATENESS DATA COLLECTION</td>
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<td>DATA COLLECTOR:</td>
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<td>DATA COLLECTOR:</td>
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<td>PATIENT COUNT:</td>
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<th>Patient Number</th>
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<tbody>
<tr>
<td>Foley alternatives in place (P, C, or B)</td>
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<td>Is Catheter Present? (Yes or No)</td>
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<td>If yes, where was Catheter placed?</td>
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<td>MD order for Foley? (Yes or No)</td>
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<td>Is drainage bag seal intact? (Yes or No)</td>
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<td>Is stat lock on? (Yes or No)</td>
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<td>Is patient vented? (Yes or No)</td>
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<td>Why does the patient have a catheter TODAY? (Check the MAIN reason for the catheter)</td>
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<td>APPROPRIATE Indications</td>
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<td>Accurate measurement of urinary output in critically ill patient *see reverse side of audit tool *</td>
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<td>Acute urinary retention or obstruction</td>
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<td>Assist healing of perineal or sacral wound in an incontinent patient</td>
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<td>Chronic indwelling catheter on admission</td>
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<td>Hospice/comfort /palliative care</td>
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<td>Perioperative use in selected surgeries</td>
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<td>Required immobilization, for trauma or surgery</td>
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<td>If none of the above reasons apply, why does the patient have a catheter TODAY? (choose one from the list below):</td>
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<td>INAPPROPRIATE Indications</td>
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<tr>
<td>Incontinence WITHOUT a sacral or perineal pressure sore</td>
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<td>immobility, confusion/dementia, patient (request)</td>
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Source: Chart and data created and published with permission Jennifer Tuttle, Tucson Medical Center
Lessons Learned

• Continual evaluation of audit tool/process
• Improved compliance when staff given the tools to change
• Physician buy in
• Constant conversations
• A simple thing as WHO is doing the audit can make a difference
# Tier 1 Protocol: Use of Indwelling Urinary Catheter Kit

<table>
<thead>
<tr>
<th>Assess for the necessity of indwelling urinary catheter</th>
<th>Encourage use of alternatives to indwelling catheter</th>
<th>Use standard indwelling urinary catheter kit</th>
<th>Ensure proper insertion technique</th>
<th>Follow maintenance and removal template for care and removal of the catheter</th>
<th>Measure CAUTI rates monthly</th>
</tr>
</thead>
</table>

Monitor CAUTI rates closely. Proceed to Tier 2 if either of the following conditions are met over a period of 6 months:

1. **ICU** ≥ 9 CAUTIs/10,000 patient days
   2 CAUTIs/1,000 catheter days
2. **Non-ICU, Acute Care** ≥3 CAUTIs/10,000 pt days & 2 CAUTIs/1,000 catheter days

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| Assess and document competency of healthcare workers performing insertion | Consider Root Cause Analysis or Focused Review of CAUTI or catheter use to identify improvement opportunities | Measure monthly for 6 months; re-evaluate. If rate has dropped below indicated levels proceed back to Tier 1 | Sources: [HICPAC CDC Guidelines on CAUTI Prevention](https://www.catheterout.org) |

(Department of Veterans Affairs, VISN 11)
Stabilization & Sealed System

STATLOCK® FOLEY STABILISATION DEVICE

STATLOCK® Stabilisation Devices are a more effective alternative to tape in helping improve clinical outcomes, quality of care and economic efficiencies.

The STATLOCK® Foley stabilisation device accommodates latex 8-22 Fr. and silicone 9-36 Fr. catheters for the ultimate in versatility. Available in adult and pediatric sizes.

Breaks in the tamper resistant seal
Drainage Bag Off Floor

< 400 mLs in Drainage Bag
Avoid splashing when emptying

Drainage Bag Labeled w Insertion Date

Canisters Labeled

IUC Catheter Care and Maintenance

IUC Anchored/Secured

Sampling Port for Urine Collection

Tamper-resistant Seal Maintains Closed System

Illustration
© 2011 Diane Kaschak Newman

(Gould, et. al., Healthcare Infection Control Practices Advisory Committee, 2010)
“Lifecycle” of the Urinary Catheter

1. Prevent Unnecessary and Improper Placement

2. Maintain Awareness and Proper Care of Catheters in Place

3. Prompt Catheter Removal. Prevent Unnecessary and Improper Placement

4. Prevent Catheter Replacement

NON-SURGICAL PATIENT NURSING PROTOCOL
FOR INDWELLING FOLEY CATHETER DISCONTINUATION

(NOTE: Surgical patients will have foley D/C’d on POD 1 or 2 unless physician documents otherwise)

Instructions:
• Indications for an indwelling urinary catheter are to be evaluated upon insertion (use Foley Insertion Criteria & Documentation note template) and daily (use Daily Need for Indwelling Catheter note template)
• Remove foley catheter as soon as possible: If patient does not meet criteria, check the box in the discontinuation section below and REMOVE the indwelling urinary catheter.

Note: Do not use this form for suprapubic catheters.

CRITERIA FOR INDWELLING FOLEY CATHETER

Mark the appropriate indication for foley catheter:
• Acute urinary retention or bladder outlet obstruction
• Strict urinary output measurement
• Incontinence in patients with open sacral or perineal wounds (Key Point: Incontinence in general is not an indication)
• Prolonged immobilization (e.g., unstable thoracic or lumbar spine, pelvic fractures, etc.)
• Improve comfort for end of life care

DISCONTINUATION OF INDWELLING URINARY CATHETER

Does not meet above criteria: Remove indwelling urinary catheter
• Document removal in HMS (use Foley Catheter Discontinued note template)
• Monitor patient’s ability to urinate post-catheter removal.

RN Signature: ________________________________

Removal Date ___________________________ Time ___________________________
Challenges

- Patient Hygiene – CHG vs. Soap and Water

- Horizontal approach to limiting the spread of HAIs
“Lifecycle” of the Urinary Catheter

1. Prevent Unnecessary and Improper Placement
2. Maintain Awareness and Proper Care of Catheters in Place
3. Prompt Catheter Removal. Prevent Unnecessary and Improper Placement
4. Prevent Catheter Replacement

Post Removal of Indwelling Urinary Catheter (IUC)

- No void in 4-6 hours
  - Scan Bladder for bladder volume
    - Volume > 400-500 mls, initiate intermittent (in-and-out) catheterization (IC) AND inform provider. Continue to prompt patient to void prior to catheterization.
    - Volume ≤400 mls, monitor for additional 2 hours for spontaneous void
      - If no void after 6-8 hours, discuss plan with physician/provider. May consider insertion of IUC. If decision is to reininsert IUC, consider removal within 24 hrs and follow removal pathway.

- Spontaneous void ≥300 mls in 4-6 hours
  - Consider scanning Bladder for PVR if retention suspected (e.g., feeling of bladder fullness)
    - PVR < 100 mls and patient is voiding
      - STOP
      - Recheck by scanning bladder every 6 hours for 24 hours; if discomfort/feeling of suprapubic fullness present, prompt patient to void
    - PVR ≥100 mls
      - Recheck by scanning bladder in 2 hours; monitor for suprapubic discomfort or feeling of bladder fullness
      - When IC results in volumes >500 consistently for 24 hours and patient is not voiding, discuss alternatives with physician/provider. May consider insertion of IUC. If decision is to reininsert IUC, consider removal within 24 hrs and follow removal pathway.

- Spontaneous void < 300 mls in 4-6 hours (or incontinence)
  - Scan Bladder for PVR
    - PVR > 400-500 mls, initiate intermittent (in-and-out) catheterization AND inform provider. Continue to prompt patient to void prior to catheterization.
    - PVR > 100 mls but ≤500 mls, initiate prompted voiding
      - If PVR > 400-500 mls, initiate intermittent (in-and-out) catheterization AND inform provider. Continue to prompt patient to void prior to catheterization.
    - PVR ≤100 mls and patient voiding
      - STOP
      - No further intervention required

Key Points:
- PVR or "post void residual" is the amount left in the bladder 15 to 20 minutes after voiding.
- Amount of fluid intake should be factored in when determining need for bladder scanning/catheterization. Low intake may have lower urine volume, and vice versa.
- If oliguria (< 300-500 mls/day), contact physician/provider.
- "Based on PVRs > 400-500 mls, intermittent catheterization can be performed every 4 to 6 hours for 24 hours but if required beyond 24 hours, discuss potential alternatives with providers."
Does patient have any of the following?
- Bladder Outlet Obstruction
- Acute Urinary Retention
- Severe GU/GYN surgery
- Significant hematuria
- Order to maintain chronic catheter

Yes → Notify MD & Obtain Order for Indwelling Catheter if not Present

No → Discontinue Indwelling Catheter

- Spontaneously Voids in 2-4 Hours > 250 cc, continue to monitor q 2 hrs, then q 4 hrs x 24
- Spontaneously Voids in 2-4 Hours < 250 cc, perform bladder ultrasound, if PVR is > 250 cc, initiate SC if PVR is < 250 cc, initiate prompted voids
- Spontaneously Voids in 2-4 Hours, but INCONTINENT perform bladder ultrasound, if PVR is > 250 cc, initiate SC if PVR is < 250 cc, initiate prompted voids
- No Void 4-8 Hours or Uncomfortable at Anytime perform bladder ultrasound, if PVR < 400 cc, monitor q hour for spontaneous void if total bladder volume is > 400 cc, initiate SC

Legend
PVR: Post Void Residual
SC: Straight Catheterization

Notify MD & Obtain Order for SC
Frequency determined by comfort & to maintain total bladder volume < 5
Minimize frequency to minimize infection risk.
Difficult Job

http://youtu.be/Pk7yqlTMvp8