Working as One for Optimal Perioperative Urinary Retention Management for Orthopedic Patients
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Conflict of Interest
I hereby certify that, to the best of my knowledge, no aspect of my current personal or professional situation might reasonably be expected to affect significantly my views on the subject on which I am presenting.

Learner Outcome
As a result of this webinar, the learner will implement quality-focused, evidence-based changes in the care of the Orthopaedic Surgery patient that improve clinical outcomes, patient satisfaction and shorten LOS.

WellSpan Surgery and Rehabilitation Hospital
York, Pennsylvania
www.wellspan.org

• The WellSpan Surgery and Rehabilitation Hospital (WSRH) is a modern, patient-centered facility for advanced orthopedic, spine, and neurosurgical treatment and inpatient rehabilitation. Opening in April 2012, it is one of six hospitals within the integrated health care delivery system of WellSpan Health in central Pennsylvania.
• The WSRH supports the journey to optimal independence by providing superior quality care, delivered by a compassionate team, in a patient-centered, healing environment.
• WellSpan’s Mission: Working as one to improve health through exceptional care for all, lifelong wellness and healthy communities.
Objectives

- Recognize effects of post-operative urinary retention during the perioperative period
- Identify urinary health management practices to reduce the adverse outcomes of urinary retention in the surgical orthopaedic, spinal anesthesia patient

Urinary Retention

- Common after surgery
- Incidence in surgical cases can vary based on the type of surgery, anesthesia, medications, and patient demographics
- Any patient population may be effected

Post-Operative Urinary Retention (POUR)

- Definition of POUR may vary between medical institutions or clinician preferences
- Most basic description of POUR is the inability to void with an occurrence of a full bladder after a surgical procedure

Anatomy and Physiology

- The bladder is funnel or balloon shaped
  - Body: Detrusor muscle
  - Neck: Urethra and sphincters
- A normal bladder responds to urge to void at 300cc, with ability to hold up to 400-500cc
Bladder Reflex

- **Bladder Filling**
  - Detrusor relaxes
  - Sphincters contract
  - Bladder begins to fill
- **150cc**
  - Bladder wall tension
  - First urge to void around 150cc
- **300cc**
  - Tension receptors notify spinal cord that bladder is full around 300cc

Micturition
- Contraction of detrusor muscle and relaxation of pelvic floor allows for emptying

Bladder and Spinal Cord Communication

Bladder Over-Distension

- If lack of ability to completely empty occurs, over-distension of the bladder may transpire
  - This may cause detrusor muscle damage, leading to reduced ability to sense fullness and experience proper bladder contraction
- Over-distension can occur at any time during the perioperative period

Bladder Over-Distension

- One episode of bladder distension can cause life-long impairment of the bladder
- Bladder levels at or exceeding greater than 500cc for periods longer than 1-3 hours placed patients at most risk for genitourinary damage

Urinary Retention in Orthopaedic Patients

- Orthopaedic patients are at increased risk for urinary retention in the perioperative period
  - National rates vary, with retention rates being reported in up to 75% of lower-limb surgical orthopaedic patients
  - Reduced mobility, pain and preoperative opioid use, and existing bladder dysfunction may contribute to increased risk
Urinary Retention and Spinal Anesthesia

• Spinal anesthesia is commonly utilized in lower-limb orthopaedic surgery patients
  – Improves clinical outcomes while achieving adequate sensory and motor blocks
  – Spinal analgesia, such as bupivacaine, act on the spinal cord neurons that also effect the control of the bladder
    • Unilateral spinal anesthesia has lower incidence of POUR

Spinal Anesthesia Effects

• Patients may have decreased ability to sense a full bladder, void, or empty completely, placing them at increased risk for POUR

• The timing of spinal anesthesia wear-off may vary between patients, but effects of spinal injection on the bladder may last for hours
  – Intrathecal opioids can enhance this sensory deficit

Polling Question

What may contribute to an orthopaedic surgical patient being at greater risk for POUR?

A. Opioid usage
B. Reduced mobility
C. Long holding times while hospitalized
D. All of the above

Urinary Retention: Adverse Patient Effects

- Abdominal pain or pressure
- Life-long issues
- Anxiety or embarrassment
- Confusion
- Incontinence
- Cardiac dysrhythmias
- Hypertension or hypotension
- Nausea and vomiting
- Chills or sweating
- Urinary tract infections
- Life-long issues
Urine and Bone Connection

- Orthopaedic surgical patients with UTIs are at risk for the spread of bacteria from the urine to the blood stream, increasing the risk for bacterial infection around the prosthesis and septic arthritis

Polling Question

True or False

Autonomic presentations due to bladder over-distension can include cardiac dysrhythmias or asystole.

Early Diagnosis and Intervention

- Orthopaedic surgical recovery times are shortening, requiring prompt diagnosis of urinary retention in the surgical period
  - Early prevention and treatment of urinary retention during the perioperative period is key to preventing damages of over-distension, while also increasing patient satisfaction and recovery rates
A comprehensive perioperative bladder management protocol is recommended.

General Perioperative Recommendations

Patient Education
- Patient involvement
  - Encourage input regarding urinary history
  - Educate on:
    - Purpose of bladder management protocol
    - Risks associated with urinary retention
    - Strategies to assist with optimal voiding
    - Prevention of urinary tract infections
      - Education on signs and symptoms of infection

Identifying Retention
- Clinical assessment, such as palpation, does not provide an accurate portrayal of bladder volume
  - This can be especially true in spinal anesthesia cases
- A bladder scanner can be used throughout the perioperative period to accurately monitor bladder volumes and need for bladder decompression
Bladder Scanner
- Provides a reliable indicator of bladder volumes
  - May slightly underestimate amounts +/- 50cc
  - Quick and non-invasive
    - Staff performing the bladder scan should be educated on the device prior to use for optimal accuracy
- Helps identify distension levels in the bladder
  - Justify need for catheterization intervention

Post-Void Residual (PVR)
- Measurement of urine in bladder after a spontaneous void
  - Useful in urodynamic assessment
    - A normal PVR is considered <200cc
  - Can be used throughout the perioperative period
    - Usually via bladder scanner
  - High PVRs are linked to increased UTI risk

Catheterization Guidelines
- Indwelling foley catheters are NOT recommended for surgical orthopaedic, spinal anesthesia patients
  - Indwelling foley catheters ideal in surgical cases lasting 3 hours or longer, or based on physician preference for patients at high-risk for POUR
    - If used, indwelling catheters recommended to be removed within 24 hours of insertion to reduce infection risk

Intermittent Catheterization
- Intermittent catheterizations are preferable
  - Cost-effective benefits
  - Less risk of UTI than an indwelling catheter
    - Invasive procedure should be justified by identifying patient bladder volumes
    - No increase in risk for UTIs with recatheterization using the intermittent method if employing aseptic technique
    - Antibiotic prophylaxis also assists in UTI prevention
Preoperative Recommendations

Identify Risk Factors

- Assess patients at high risk for POUR
  - Age and gender may not accurately represent POUR risk factors, although patients with genitourinary histories, such as benign prostatic hypertrophy (BPH) may be at greater risk
  - Identifying at-risk patients allows for close monitoring and possible preoperative intervention, such as initiation of medication or consultation preoperatively

International Prostate Screening Score (I-PSS)

- Standardized questionnaire
  - Validated by American Urological Association (AUA)
  - Simple and effective way to recognize urinary issues that may contribute to urinary retention
  - Takes approximately 5 minutes to complete individually or by oral proctor

<table>
<thead>
<tr>
<th>In the past month how often have you...</th>
<th>Not at all</th>
<th>Less than 5</th>
<th>About half the time</th>
<th>More than half the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>...had the feeling of not emptying your bladder?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>...had to urinate less than every two hours?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>...had you stopped and started again several times while urinating?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>...had it difficult to postpone urination?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>...had a weak urinary stream?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>...had to strain to start urination?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>...gotten up at night to urinate?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Mild: Score 1-7
Moderate: Score 8-19
High: Score 20-35

High-Risk Patients

- Awareness assists in prevention
  - Additional monitoring

- Medication intervention
  - Some high-risk patients may benefit
  - Common class is alpha-blockers
    - Example: Tamsulosin

Preoperative Void

- Patients should void preoperatively
  - Documentation of time of void and amount of void
    - Allows for consistent monitoring of urine output
      - Assists in intervention needs in later operative stages
      - Identify possible preoperative distension levels or voiding problems

Pre-Op Post-Void Residuals

- High-risk patients for urinary retention can benefit from preoperative post-void residuals (PVR) to avoid a full bladder in the operative suite
  - May require early intervention catheterization
    - The earlier the intervention, the less likely for adverse effects or subsequent bladder over-filling
    - PVR pre-op greater than 200cc can place patient at risk

Polling Question

What class of medication may benefit the patient in the perioperative treatment of urinary retention?

A. Mineralocorticoids
B. Alpha-blockers
C. Thioxanthenes
D. Antianginal agents
Intraoperative Recommendations

General

- Indwelling catheters recommended for surgeries that will last longer than 3 hours
  - Indwelling catheters may also be recommended by clinicians for very high-risk patients, or patients with a known history of POUR complications

Bladder Scan

- Bladder scan at end-of-case
  - Catheterize in the operating room for bladder levels greater than 300cc at the end of surgical case
    - >300cc at completion of case is a high POUR risk
  - Operating room catheterization benefits:
    - Sterile environment decreases infection risk
    - Focus on patient comfort and privacy
    - Increases patient satisfaction levels

Recovery Recommendations
Bladder Scan

• Continue close bladder scan monitoring
  – Straight catheterization for volumes greater than 400cc
  – Patient satisfaction focus
    • Focus on privacy and comfort due to close quarters
    • Patient may be in pain or experiencing post-surgery effects
      – Education and purpose of scanning and any need for intervention

Post-Surgical Recommendations

Post-Surgical Interventions

• Bedside commode
• Privacy (if applicable)
• Running water
• Positioning
• Early ambulation
• Multi-modal pain management
• Timed voiding for cognitively impaired individuals
• Warm compresses to lower abdomen
• Medication considerations
• Urology consultation

Bladder Monitoring

• Monitor patient for urinary distension symptoms
  – Lower abdominal pressure or bloating, incontinence, nausea or vomiting, cardiac dysrhythmias

• Close bladder scan monitoring
  – Scan on arrival and every 3 hours until patient voiding
  – Continue documentation of bladder levels
Post-Surgical Catheterization

- For bladder scan levels >400cc
  - Have patient attempt to void if applicable
    - Provide safety, privacy, and comfort
    - Initiate interventions to assist in void attempt if needed
  - If unable to void or to attempt to void, straight catheterization for >400cc levels
    - >500cc requires a critical response

Catheterization Considerations

- Educate patient on bladder health
  - Catheterized patients should be monitored for and educated on signs and symptoms of infection
  - Special considerations for orthopaedic patients

- Consider indwelling catheter with physician after two straight catheterizations
  - Urology consultation may also benefit patient

Post-Operative Patient Void

- Post-void residuals should be obtained after a patient void for at least two readings <200cc

<table>
<thead>
<tr>
<th>Post-Void Residual</th>
<th>Post-Void Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;200cc</td>
<td>200cc-399cc</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Stop PVR after two readings &lt;200cc</td>
<td>Continue post-void residuals and bladder scan monitoring until two PVR levels &lt;200cc</td>
</tr>
<tr>
<td>Reassess as needed</td>
<td></td>
</tr>
</tbody>
</table>

- Straight catheterization for PVR >400cc

Polling Question

How does using post-void residuals as a bladder management tool in the postoperative period benefit the spinal anesthesia, orthopaedic patient?

A. PVRs identify volumes that may require intervention.
B. PVRs are an accurate record of intake versus output.
C. PVRs are not necessary as palpation is a reliable tool.
D. PVRs help diagnose urinary tract infections.
Working as One

Perioperative and Operative: Spinal Bladder Management Algorithm

**LPSS Questionnaire**
- Mild: Score ≤7
- Moderate: Score 8-10
- High-Risk: Score 11-19

**Preoperative Suite:**
- Mild to Moderate Risk Patients
  - Encouragement of patient to void
  - Documentation of time of void

**Preoperative Suite:**
- High-Risk Patients
  - Encouragement of patient to void
  - Post-void residual scan
  - Consult with physician for PVR >200cc

**Operating Room**
- Indwelling foleycatheter for procedure >3 hours
- Bladder scan patient end of case
- Bladder Scan >300cc
  - Straight catheterization in operating room
  - Document intervention
  - Communicate interventions or bladder volumes to recovery room nurse

**Bladder Scan <300cc**
- Document findings
- Continue to monitor

**Recovery:**
- Spinal Bladder Management Algorithm
- Scan before leaving recovery and as needed
- For scan ≤ 400cc
  - Straight catheterization
  - Document amount
  - Report urine, scan, and IV intake volumes to nurse receiving transfer
- For scan >400cc
  - Document scan amount
  - Report scan volumes, times, and IV intake volumes to nurse receiving transfer
- Patient transferred to post-surgical area

**Post-Surgical:**
- Spinal Bladder Management Algorithm
- Voiding on admission to unit
- No Spontaneous Void: Bladder Scan
  - ≤100
    - Scan in 3 hours
    - Document findings
  - 100-199
    - Scan in 3 hours
    - Document findings
  - >200
    - Scan until voiding spontaneously with PVR <200cc for two readings
    - Reassess PRN
- Spontaneous Void: Post-Void Residual (PVR)
  - ≤100
    - Stop PVRs after two readings
  - >200
    - Measure urine output
    - PVR within 30 minutes of void
    - Document all findings

For PVR 200-399:
- Scan until voiding spontaneously with PVR <200cc for two readings
- Reassess PRN
Patient Experience

Early engagement
Education
Respect
Comfort
Early intervention

Thank you!
Questions?

References


Thank you!
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References


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