Advanced Urinary Catheter Placement

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Learning Objectives

- Recognize the indications for a urinary catheter.
- Identify the lower urinary tract anatomy important for catheter insertion.
- Describe proper catheter insertion technique.
- Managing difficult catheter insertions.
- Identify the common types of urethral catheters and the situations in which to use them.
- Recognize complications of catherization.
Indications for Catheterization

- **Drainage**
  - Relieve acute or chronic urinary retention
  - Measure urine output in ill or surgical patients
  - Allow healing after urinary tract trauma or surgery
  - Evacuate clot or purulent material
  - Urine for culture (uncommon)
  - Measure post void residual (uncommon)

- **Instillation**
  - Cystography
  - Therapeutic agents
Contraindications

- **Absolute**
  - Urethral injury associated with pelvic trauma

- **Relative**
  - Urethral stricture
  - Recent GU surgery
  - Presence of an Artificial Urinary Sphincter (AUS)

- Inappropriate Catheter Use
Misuse of Catheters

- Management of urinary incontinence
- Monitoring urine output when patient can reliably collect urine
- Checking post void residual when a portable ultrasound unit for this purpose is available
Female Urethra

- Short (3.5 to 4 cm) and Straight
- Occasionally difficult to find the urethral meatus. Can be located on the anterior vaginal wall
Male Lower Urinary Tract
Male Urethra

- Long (18 to 20 cm) and Curved
- Two Curves
  - Junction of bulbar and penile urethra
  - Junction of the bulbar and membranous urethra
- Two Obstruction Points
  - External sphincter
  - Prostate
Preparation for Catherization

- Patient supine
- Female patients in “frog-leg” position or stirrups
- Bed at comfortable height
- Stand on same side of bed as dominant hand
- Drape genital area
- Test the catheter’s retention balloon
- Clean around the urethral meatus
- Lubricate both the catheter and urethra
Female Catheter Insertion

- With the nondominant hand, spread the patient’s labia. This hand is now contaminated.
- Lubricate and insert the catheter half way.
- If urine returns, inflate the retention balloon.
- If not, attempt irrigation.
Female Catheter Difficulties

- Finding the urethral meatus
  - Obese patient - Stirrups and Assistance with labial retraction
  - Postmenopausal vaginal atrophy - Nondominant hand, hold index and middle fingers together. Palpate the meatus, slide fingers just past, use groove between fingers as a guide for the catheter.

- Stricture is uncommon
Male Catheter Insertion

- With the nondominant hand, grasp the shaft of the penis. This hand is now contaminated.
- Hold the penis at a 90° angle to the body thus removing the distal penile curve.
- Using gentle, but firm pressure advance the catheter all the way to the bifurcation.
- If no urine returns, gently press the patient’s suprapubic area.
Male Catheter Insertion

- If still no urine returns, slowly irrigate with 20mL sterile saline with catheter-tip syringe. Should flush in and come out easily.
- Inflate the balloon with sterile water.
  - Air is too compressible
  - Electrolyte/glucose solutions can precipitate
- Attach bag and place below bladder level.
- Return foreskin to normal position.
- Secure catheter.
“Go To” Catheters for Males

18 or 20 French Coudé Tip
- “Elbow”
- $\uparrow$ Diameter = $\uparrow$ Stiffness
- Enlarged Prostate

12 French Silicon Straight Tip
- Relatively Stiff
- Small Diameter
- Urethral Stricture
Difficult Male Algorithm

Clinical history and exam. (urethral/prostate surgery/trauma, pelvic radiation, STDs)

Inject 20cc lubricating jelly into the urethra

Possible prostate enlargement

Possible urethral stenosis or bladder neck contracture

18 or 20 Fr Coudé Tip

12 or 14 Fr Silicone

Stops before prostate

Stop!
Call your friendly local urologist or urology PA
Councill Tip Catheter

- Pre-punched hole for placing over wire

![Hole for Wire](image)

Hole for Wire
Difficult Male Algorithm (cont’d)

Stop! Call your friendly local urologist or urology PA

- Blind guidewire attempt (0.035 or 0.038 in hydrophilic coated). Pass a 5 Fr open ended catheter. Exchange wire (super stiff). Pass a 12-14 Councill.

Flexible cystoscopy. Attempt to insert a guidewire. Pass a Councill

Percutaneous cystostomy catheter
Gross Hematuria

- Rüsch Couvelaire Tip Catheter
  - Large “eye” for clot evacuation

- 3-Way Catheters
  - Irrigation port
  - Drain port (center)
  - Drain “eye”
  - Irrigation inlet
Gross Hematuria

- Evacuate all clot from the bladder using catheter tip syringe and normal saline
Continuous Bladder Irrigation

- Normal saline drip with 3 L bags
- Drip rate to keep output light pink
- Tubing with spikes and flow regulator
Continuous Bladder Irrigation

- Contraindications
  - Abnormal / no bladder sensation
  - Dementia / inability to ask for help
Suprapubic Catheter (Tube)

- First change after tract established 4-6 weeks
- Change every month thereafter
- Don’t be afraid to change! Likely the easiest catheter change you will do.
Clean Intermittent Catheterization

- **Indications**
  - Neurogenic or hypotonic bladder
  - Bladder outlet obstruction (prostate/stenosis)
  - Failed voiding trials
  - High Post-Void Residuals

- **Benefits**
  - Health: Decreased UTI risk, Protect upper tract
  - Patient: Convenience, Control
Clean Intermittent Catheterization

- Teaching
  - Good urology nurse
  - Video, printed materials

- How often

<table>
<thead>
<tr>
<th>Residual Urine</th>
<th>Number of Times to Cath Per Day</th>
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<tbody>
<tr>
<td>Unable to void</td>
<td>4-6</td>
</tr>
<tr>
<td>&gt;500mL</td>
<td>3-4</td>
</tr>
<tr>
<td>300-500mL</td>
<td>2</td>
</tr>
<tr>
<td>150-300mL</td>
<td>1</td>
</tr>
<tr>
<td>&lt;150ml</td>
<td>1 or every other day</td>
</tr>
<tr>
<td>&lt;150ml three consecutive</td>
<td>Stop and reassess</td>
</tr>
</tbody>
</table>
Catheter Associated UTI

- 40% of all nosocomial infections
- Risk Factors
  - Female
  - Prolonged Catherization
- Culture from drainage system port – not bag!
- Asymptomatic Bacteriuria
  - $>10^5$ CFU/mL
  - No fever $>38^\circ$C, no suprapubic tender, no CVA tender
  - Treatment not necessary
Catheter Associated UTI

- **Symptomatic CAUTI**
  - $>10^5$ CFU/mL or $>10^3$ CFU/mL with pyuria
  - Fever $>38^\circ$C, suprapubic tender, CVA tender, AMS, SIRS
  - Empiric antibiotics - Gram stain, prior culture
  - Switch to culture specific antibiotics

- **Prevention**
  - Antiseptic gels/irrigations, silver/antibiotic coated catheters all have no or little evidence
  - No role/evidence for antibiotic prophylaxis
Catheter Complications

- Paraphimosis – Replace the foreskin!
Catheter Complications

- Unable to remove catheter
  - Encrustation – if indwelling for a long time
  - Suture entrapment
  - Unable to deflate balloon
- Hematuria
- Urethral and meatal strictures
- Urethral perforation
- Allergic reaction
Catheter Complications

- Long-term
  - Malignant neoplasm
  - Stone formation
  - Bladder neck and urethral erosion
  - Don’t check UA or urine culture in the asymptomatic patient! It will always be positive.
Questions?

Schaeffer, AJ. Placement and management of urinary bladder catheters. In: UpToDate, Basow, DS (Ed), UpToDate, Waltham, MA, 2012.

Fekete, T. Urinary tract infection associated with urethral catheters. In: UpToDate, Basow, DS (Ed), UpToDate, Waltham, MA, 2012.