Urinary System
Altered Elimination

-Emotional Considerations:

-NI's: privacy, encourage questions, provide reassurance, be supportive, nonjudgmental

Indications for Catheterization
- Relief of urinary retention
- Bladder decompression pre-operatively & operatively
- Facilitate surgical repair of urethra
- Splinting of the ureters or urethra to facilitate healing after trauma or OR
- Instill medications or fluids into bladder
- Accurate measurement of output
- Measure residual urine
- Achieve continence
- Urodynamic testing
- Collection of sterile urine sample

C H O R U S
- C – comfort
  - Comfort measures for terminally ill
  - Open sacral or perineal wounds in an incontinent patient
- H – hemodynamic monitoring
  - Close monitoring of urinary output
- O – obstruction
  - Outlet obstruction (i.e. – BPH, blood clots)
- R – retention
  - Urinary retention
- U – urologic
  - Urologist placed catheter
- S – surgery
  - Urologic, GYN, or perineal surgeries
  - Epidural catheter
  - Orthopedic fracture before OR

<u>Catheters</u>
- French scale 0.33mm diameter = 1 French
- Sizes
  - Female – 14 F to 16 F
  - Male – 16 F to 18 F
- Types
  - Nonretentive – straight cath
  - Self-retaining – foley catheter

Four Catheterization Routes
- Urethral -
- Ureteral -
- Suprapubic -
- Nephrostomy tube -

Robinson or Simple: straight catheter with 1 or more side openings (residual volume, retention, UA /C&S);

Can be: **Whistle Tip**- oblique open end (hematuria, clots)
Hollow-Tipped or Multi-Eyed: many openings (lavage the bladder, + clots)
Coude' tipped: semi-rigid curve (tortuous urethra, enlarged prostate)

Foley Catheters: Self-retaining; doubl lumen; many tips (straight, coude, short, long) many balloon sizes (5-30 ml) also 75-100 ml

Council Catheter: special opening tip of a foley cath- allows for a stylet (male screw tip to protrude the opening for attachment to a threaded filiform); strictures

3-way Catheters: 1 lumen _____, 1 lumen _____, 1 lumen _____; continuous irrigation

Mushroom or dePezzar Catheter: 2 or more openings, various sizes, used for suprapubic or nephrostomy tubes

Malecot or Winged- tip: 3 or 4 slits, compressed to form wings; nephrostomy tubes

Risks associated with urinary drainage

- Urinary Tract Infection (e.coli, proteus, klebsiella, pseudomonas, strept, staph, aerobactor)
- Tissue Trauma : during catheterization; necrosis from an oversized catheter or continuous pressure

Nursing Interventions (catheters)

- Prevent complications
- Maintain patency
- Maintain closed system / aseptic technique
- Avoid backflow
- Perineal care
- Secure with leg strap
- Assure proper operation of drainage system
- Select proper size catheter
- Empty drainage bag q 8 hours & prn
- Provide adequate fluid intake
- Acidify the urine
- Record time & amount of 1st void after discontinue catheter

Urinary Retention: condition in which urine is …

- Mechanical Obstruction
- Urethral stricture
- Calculus
- Inflammation
- Hyperplasia

- Tumors

- Functional Obstruction
- Neurogenic bladder
- Detrusor muscle atrophy
- Anxiety
- Medications

Urinary Retention: Clinical Manifestations

- absence of voided urine: distinguish between oliguria and retention
- distended bladder
- frequent voiding

Urinary Retention: Treatment options:

-Independent nursing interventions- to promote urination:

-Catheterization

-Urethral dilation- once with a rubber/silicone indwelling catheter, increase size daily; or dilated more quickly with size graduated SOUNDS, FILIFORMS, & FOLLOWERS

-Surgery- if dilation is unsuccessful; tumor? calculi?

Urinary Incontinence - Involuntary expulsion of urine from the urinary tract

- Patho:

- Need bladder sphincter control to have urinary continence
- Bladder capacity- 200-250 ml of urine when urge to void
- When bladder capacity is reached, the detrusor muscle begins contracting- internal sphincter opens- urine enters the urethra – relaxation of external sphincter and perineal muscles- bladder empties
- Any disruption in this system creates urinary incontinence

- Continence:

  a. Interaction of nerves that control muscles of bladder, bladder neck, urethra and pelvic floor as well as closure of urethra
  b. When bladder fills, SNS prevents detrusor muscle contraction- control center in cerebral cortex, brain stem and sacral part of spinal cord

- Micturition:
  a. Reflex of autonomic control that triggers contraction of the detrusor muscle at the same time as relaxation of external sphincters and pelvic floor muscles

b. When detrusor muscle contracts, the ureterovesical junction of ureter closes and round bladder forms a funnel shape
c. Voluntary act to void- learned and controlled by cerebral cortex and brainstem
d. Contraction if external sphincter inhibits voiding

Causes of Incontinence

- Cerebral clouding
- Disturbances in CNS pathways
- Spinal cord lesions
- Damage to peripheral nerves of the bladder
- Sphincter damage
- Relaxed pelvic musculature

Causes of Urinary Incontinence

- D – delirium, dehydration, depression
- R – restricted mobility, rectal impaction
- I – infection, inflammation, impaction
- P – polyuria, polypharmacy

Categories of Incontinence

- Stress incontinence
- Urge incontinence
- Reflex / overflow incontinence
- Total incontinence
- Functional incontinence

Stress Incontinence

Loss of urine with an increase in intra-abdominal pressure (laugh, sneeze, cough, lift)

Causes:

Treatment

Kegel exercises / Vaginal weights- strengthens pelvic floor muscles

Medications : antidepressants, estrogen, anticholinergics/antispasmodics

Vaginal Cone Therapy: hold in place without slipping out, up to 15-20 minutes a day

Surgery- for severe cases

Bladder suspension surgery – Vesicourethropexy (Marshall-Marchetti)- suspending the urethra and bladder neck by suturing the anterior vaginal wall on each side to the periosteum of the pelvic bones and lower rectum.

Post:

Urge Incontinence

Uncontrolled loss of urine accompanied by a strong urge to void

Causes: neurological, UTI, medication s/fx

Treatment

Retraining programs: increasing bladder volume and lengthening the time between voids; toileting q 2 hrs

Medications: imipramine / tofranil - relaxes bladder; tolterodine tartrate / Detrol- blocks contractions

Internal & External Drainage Devices (Texas catheter, Depends)

Reflex / Overflow Incontinence

Voiding occurs without warning – permanent with spinal cord injuries

Overdistension of bladder- max capacity, urine leaks out

Causes: obstruction, spinal cord degeneration, cerebral cortex lesions

Treatment

Frequent voiding

Self-catheterization

Scheduled fluid intake

Surgery- sphincterotomy

Medications: bethanechol chloride/urecholine- promotes bladder emptying

CredÉ Method- manual expression of urine from bladder

Total Incontinence

Continuous urine leakage

Causes:

Treatment

External pads – Depends, adult diaper

Artificial sphincters- hydraulic-activated mechanism;
post-op- observe for fever or pain, swelling, recurrence of incontinence
complications: urethral erosion, abscess, cellulitis, mechanic malfunctions

Functional Incontinence

Loss of urine control in socially unacceptable situations when bladder & sphincter function are normal

Causes:

Treatment

Skin care

Frequent toileting

Environmental manipulation