

Student Name: Rachel Dietz

Medical Diagnosis/Disease: Urinary Tract Infection (UTI)

### NCLEX IV (8): Physiological Integrity/Physiological Adaptation

#### Anatomy and Physiology

##### Normal Structures

- **Kidneys** – 2 bean-shaped organs located on either side of the spine, just below the rib cage. They play a crucial role in filtering waste products and excess substances from the blood to form urine.  
Glomerular Filtration: Blood enters the glomerulus, a network of capillaries with fenestrated endothelium (having tiny pores). The high pressure in the glomerulus forces water, electrolytes, small molecules (such as glucose and amino acids), and waste products (such as urea and creatinine) out of the blood and into the Bowman's capsule. Larger molecules like proteins and blood cells are generally not filtered because they are too large to pass through the fenestrations.  
Filtration Membrane: The filtration membrane consists of three layers: the fenestrated endothelium of the glomerular capillaries, the basement membrane, and the podocytes (cells with foot-like extensions) of Bowman's capsule. These layers act as a sieve, allowing small molecules and ions to pass through while retaining larger molecules.  
Selective Reabsorption: After filtration, the filtrate (now called tubular fluid) moves through the renal tubule, where selective reabsorption occurs. Essential substances like glucose, amino acids, and most of the filtered water are reabsorbed from the tubular fluid back into the bloodstream. This process helps maintain the body's fluid balance and prevents the loss of important nutrients.

#### Pathophysiology of Disease

- A UTI is an invasion of all parts of the UT: kidneys, bladder and urethra. Via a pathogen.
- Cystitis (infection of the bladder)
- Urethritis (infection of the urethra; most often related to sexually transmitted infection)
- Usually caused by E. Coli viral and fungal organisms
- Pathogens from the perineum are introduced via ascending route up the urethra.
- Gram-negative bacilli normally found in GI tract and some
- Gram-positive organisms: streptococci, enterococci, and staphylococcus saprophyticus
- Local defense mechanisms in the bladder break down.
- Bacteria invade the bladder mucosa and multiply.
- Bacteria can't be readily eliminated by normal urination.
- The pathogen's resistance to prescribed antimicrobial therapy usually causes bacterial flare-up during treatment.
- Recurrent lower UTIs result from reinfection by the same organism or a new pathogen.
- Lower UTIs are much more common in females 20-24 than in males (except older adult males >50), probably because natural anatomic features facilitate infection.
- Kidney infections happen when the bacteria travel even higher, up into the kidneys. The medical term for kidney infection is "pyelonephritis." This is more serious than a bladder infection, and can lead to other serious problems if it is not treated properly.

### NCLEX IV (7): Reduction of Risk

#### Anticipated Diagnostics Labs

- Dipstick urine analysis (detects RBC, WBC, nitrates, bacteria)
- Urine culture (clean catch)
- **CBC- WBC (infection)**

#### Additional Diagnostics

- Ultra sound, **CT-** Computed tomography, MRI, cystoscopy showing urinary tract abnormalities
- Cystourethroscopy
- excretory urography

**Secretion:** In addition to filtration and reabsorption, the kidneys also secrete certain substances from the blood into the tubular fluid. This secretion process allows for the elimination of additional waste products and helps maintain the body's acid-base balance.

**Formation of Urine:** As the tubular fluid progresses through the renal tubule, reabsorption and secretion modify its composition. By the time the fluid reaches the collecting ducts, it has been further concentrated and adjusted according to the body's needs. The final product, urine, is then drained into the renal pelvis and transported to the bladder for storage and eventual elimination from the body.

- **Bladder** – a hollow, muscular organ located in the pelvis, behind the pubic bone. Its primary function is to store urine until it is expelled from the body. The detrusor muscle is the muscle layer responsible for contracting to expel urine from the bladder during urination. The bladder wall also contains layers of connective tissue and elastic fibers that allow the bladder to stretch as it fills with urine. The bladder also contains receptors that signal the brain when it is full, prompting the urge to urinate. (400-/600 mL)
- **Ureters** – primary function is to transport urine from the kidneys to the bladder through peristaltic contractions, which are rhythmic muscular movements that propel urine forward. The ureters prevent urine from flowing back into the kidneys by the presence of one-way valves where they enter the bladder.

**Urethra** – a tube that connects the bladder to the outside of the body. In males, the urethra serves a dual function, allowing the passage of both urine and semen. In females, it is

shorter and only serves as a passage for urine. The urethral sphincters, both internal and external, control the flow of urine from the bladder out of the body. During urination, the internal sphincter relaxes involuntarily, while the external sphincter relaxes voluntarily to allow urine to pass through the urethra.



**NCLEX II (3): Health Promotion and Maintenance**

**NCLEX IV (7): Reduction of Risk**

- Contributing Risk Factors
- Urine retention
  - Previous UTI
  - Pregnancy
  - Age
  - Poor hygiene
  - Indwelling catheter
  - Obesity
  - HIV infection
  - Prior injury to urinary tract

- Signs and Symptoms
- Burning sensation
  - Polyuria
  - Foul-smelling urine
  - Voiding less than 200mL
  - Urine retention
  - Fever/chills
  - Elevated WBC
  - Hematuria
  - Urethra pain
  - Kidney pain

- Possible Therapeutic Procedures
- Non-surgical
- Encourage fluids
  - Instruct patient to void every 2-3 hrs
  - Encourage cranberry juice/vitamin-C500-100mg/day
  - Antibiotics
  - Urinary analgesic
  - Limit use of indwelling catheters
  - Warm compress
- Surgical
- N/A

- Prevention of Complications
- (What are some potential complications associated with this disease process)
- Repeat infection
  - Kidney damage
  - Narrowed urethra in men
  - Sepsis (body response to infection-wide spread)
  - Urosepsis
  - Damage to the urinary tract lining
  - Pyelonephritis
  - Kidney abscess
  - Acute urinary outlet obstruction
  - Recurrent UTI
  - Acute bacterial prostatitis (male)

**NCLEX IV (6): Pharmacological and Psychosocial/Holistic**

**NCLEX IV (5): Basic Care and Comfort**

**NCLEX III (4):**

**Parenteral Therapies**

- Anticipated Medication Management
- Analgesics
  - Antibiotics

- Non-Pharmacologic Care Measures
- Adequate fluid intake
  - Patient teaching
  - Apply heating pad to suprapubic area
  - Sitz bath

**Care Needs**

- What stressors might a patient with this diagnosis be experiencing?
- Pain associated w/UTI
  - Confusion in older adults
  - No support

**Client/Family Education**

**NCLEX I (1): Safe and Effective Care Environment**

- List 3 potential teaching topics/areas
- Stay well hydrated
  - take showers instead of baths and maintain personal hygiene
  - do not hold urine when you have the urge to pee

- Multidisciplinary Team Involvement
- (Which other disciplines do you expect to share in the care of this patient)
- Radiology
  - Urologist
  - Laboratory
  - Case management

**Potential Patient Problems (Nursing Diagnoses)**

**To Be Completed Before the Simulation**

Anticipated Patient problem: Impaired urinary elimination

Clinical Reasoning: distended bladder, voiding <30mL/hr, dribbling when voiding, fluid intake <8oz/hr, cramping, burning sensation.

Goal 1: Pt will be free of a palpable bladder distention during my time of care

<b>Relevant Assessments</b>	<b>Multidisciplinary Team Intervention</b>
(Prewrite) What assessments pertain to your patient's problem? Include timeframes.	(Prewrite) What will you do if your assessment is abnormal?
Assess for bladder distention / retention Q4hr + PRN	straight urinary catheter inserts PRN PVR over 500 cc on bladder scan, or if uncomfortable/ unable to void
Assess lab values for Cr Q12hr + PRN	Encourage high fiber in meals and low protein to help reduce Cr levels.
Assess I&O Q8hr + PRN	Use bladder scan to determine post residual void or if having difficulty voiding
Assess frequency of voiding, color, smell Q3hr + PRN	Encourage the patient to increase fluid intake of 1.5 to 2 L/day as tolerated
Assess VS for high blood pressure Q6hr + PRN Assess patients' activity level Q4hr + PRN	Assist in ambulation, apply SCD bilateral calf when in bed/chair.
Assess VS for high blood pressure Q6hr + PRN	Administer antihypertensive PRN SBP >160 , high blood pressure can affect lowering Cr levels

Goal 2: Pt will void at least 30mL/hr during my time of care

**To Be Completed Before the Simulation**

Anticipated Patient Problem: Acute Pain

Clinical Reasoning: Sharp, severe pain on back/side (flank pain) eases with position changing, pain scale 8/10, HR >100bpm, BP >120/80.

Goal 1: Patient will report < 3/10 pain during my time of care

<b>Relevant Assessments</b>  (Prewrite) What assessments pertain to your patient's problem? Include timeframes.	<b>Multidisciplinary Team Intervention</b>  (Prewrite) What will you do if your assessment is abnormal?
Assess the description of pain: quality, location, severity Q6hr	Apply heating pad to affected location.
Assess vital signs Q3hr	Provide distraction and relaxation techniques
Assess costovertebral angle (CVA) tenderness Q4hr	Administer analgesics as ordered PRN pain 4-10/10
Assess support and positioning Q2hr	Adjust positioning for comfort
Assess voiding sensation: burning Q4hr	Administer antibiotics as order for UTI
Assess for participation in physical activity Q4hr	Administer analgesics before activity (PT, OT, ambulation)

Goal 2: Patients VS will return to baseline range during my time of care

**To Be Completed During the Simulation:**

**Actual Patient Problem: Decreased cardiac output**

**Clinical Reasoning:** Urine output <100mL since admission, SOB, spo2 88%, on 6L NC, edema, crackles in lungs, amber urine color

Goal: Pt will void at least 30mL/hr during my time of care. Met:  Unmet:

Goal: Pt will maintain Spo2 >92% on supplemental O2 during my time of care. Met:  Unmet:

**Actual Patient Problem: Impaired Skin integrity**

**Clinical Reasoning:** Stage 2 pressure injury on coccyx, placed in bucks' traction, albumin low, immobile.

Goal: Pt will not form any new pressure injuries during my time of care. Met:  Unmet:

Goal: Pt will be turned/ repositioned Q2hr during my time of care. Met:  Unmet:

Additional Patient Problems:

Below will be your notes, add more lines as needed. **Relevant Assessments:** Indicate pertinent assessment findings.

**Multidisciplinary Team Intervention:** What interventions were done in response to your abnormal assessments?

**Reassessment/Evaluation:** What was your patient's response to the intervention?

Patient Problem	Time	Relevant Assessments	Time	Multidisciplinary Team Intervention	Time	Reassessment/Evaluation
DCO	0855	SOB, Spo2 88%, difficulty speaking	0858	Elevated HOB, applied 2L NC, encouraged deep breaths	0900	Spo2 90% NC 2L RR 24, irregular breaths with crackles present
DCO	0913	Restlessness, difficulty breathing, "I don't feel so good" "I'm so cold" T 100.6, breath sounds irregular, with crackles	0913	Increase O2 to 4L, encouraged deep breathing and coughing	0930	Breath sounds irregular with crackles present,
ISI	0942	Lying on floor, "help, please!"	0944	Assisted back in bed, bucks' traction is placed	1144	Skin assessed clean, dry, no new Pressure injuries
ISI	2000	Spo2 92% 2L NC, RR 22, 4/10 pain "I'm feeling better, the pain is not as bad as it was", stage 2 pressure injury on coccyx - pink circular ulcer	2010	Applied barrier cream to coccyx, notified provider.	2200	Stage 2 pressure injury pink, round, no drainage, applied barrier cream.
DCO	2100	"Where am I", SOB, Spo2 85%,	2105	Increased O2 to 6L NC, encourage deep	2120	Wheezing breathing, restlessness, RR32

		restlessness, lung sounds clear, RR32, T 101, urine cloudy and low output.		breaths, notified provider of possible distributive shock		

## ATI Virtual Clinical Questions and Reflection:

- 1) Identify two members of the healthcare team collaborating in the care of this patient:
  - a. Orthopedics
  - b. Charge nurse
- 2) What were some steps the nursing team demonstrated that promoted patient safety?
  - a. Hand hygiene was performed before assessing patient, they put on gloves, but it wasn't necessary.
  - b. Medication reconciliation with the pharmacy about her home medications.
  - c. Elevating HOB and administering O2 therapy when it was clear she was SOB and Spo2 88%
- 3) Do you feel the nurse and medical team utilized therapeutic communication techniques when interacting with individuals, families, and health team members of all cultural backgrounds?
  - a. If **yes**, describe: \_\_\_\_\_  
\_\_\_\_\_
  - b. If **no**, describe: I felt like there was a lot of talking about the patient in front of the patient. It was rare to see the interacts or conversations include the patient when discussing what could be going on. She had asked a few times what is going on, why is this happening to me. We know that she lives alone, and she is scared.

## Reflection

- 1) Go back to your Preconference Template:
  - a. Indicate (circle, star, **highlight**, etc.) the components of your preconference template that you saw applied to the care of this patient.
- 2) Review your Nursing Process Form: Did you select a correct priority nursing problem?
  - a. If **yes**, write it here: \_\_\_\_\_
  - b. If **no**, write what you now understand the priority nursing problem to be: Decreased cardiac output in relation to her CHF
- 3) Review your Patient Problem Form: Did you see many of your anticipated nursing assessments and interventions used?
  - a. Were there interventions you included that *were not* used in the scenario that could help this patient?
    - i. If **yes**, describe: Assess costovertebral angle (CVA) tenderness, this can determine if the lower UTI has made its way to the kidneys, this can also worsen her cardiac output since the kidneys play a huge role in working with the heart
    - ii. If **no**, describe:  
\_\_\_\_\_  
\_\_\_\_\_
- 4) After completing the scenario, what is your patient at risk for developing?

- a. Distributive shock
- b. Why? They are becoming septic. She was admitted with urosepsis and then potentially becoming sepsis which is a widespread infection that triggers a whole-body inflammatory response. Distributive shock (vasodilatory shock) happens when not enough blood flow is going to the brain, heart and kidneys that can cause vital organ damage. Her altered mental status, tachypnea, SOB, cough and fever are signs.

5) What was your biggest “take-away” from participating in the care of this patient? How did this impact your nursing practice?

My biggest take away from this experience was to look at the bigger picture and ask the right questions when getting report. Something as simple as a UTI can becoming or be something much greater. Especially when you don't get the correct information or the full story. The patient was unable to communicate effectively, but if the ER had gotten the medication showing she is taking medication for CHF the care would have been different. Her SOB and crackles in the lungs were not impaired gas exchange or related to the UTI that brought her in, but the fluid overload from CHF. Treating that will help with her ABCs. Knowing your patient's history can help determine if what is happening to the patient is related to her past medical history. This impacts my nursing practice as a reminder to advocate for your patient and ask more questions.