

Student Name: Nicholas Vitella

Medical Diagnosis/Disease: UTI

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

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

#### 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

women shorter urethra higher risk of UTI

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 allow small molecules 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.

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

#### Pathophysiology of Disease

A UTI is an invasion of all parts of the urinary tract which includes the kidneys, bladders, and urethra, by pathogens.

Cystitis (infection of the bladder) spread to kidneys (pyelonephritis)

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 an 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,

#### Anticipated Diagnostics

##### Labs

Urinalysis

Culture

Urine Dipstick

##### Additional Diagnostics

Ultrasound

CT Scan

MRI

Cystoscopy

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

Contributing Risk Factors  
 Urine retention  
 Previous UTIs  
 Age  
 Poor hygiene  
 Indwelling catheter  
 Obesity  
 Sexual activity  
 Pregnancy  
 feces

Signs and Symptoms  
 Burning  
 Frequency  
 foul odor  
 urgency  
 retention  
 fever/chills  
 abd pain/discomfort  
 painful urination  
 n/v  
 hematuria  
 confusion

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

Possible Therapeutic Procedures  
Non-surgical  
 Catheter  
 Bladder Scan  
  
Surgical  
 Ureteroureterostomy

Prevention of Complications  
 (What are some potential complications associated with this disease process)  
 Repeat infection  
 kidney damage  
 sepsis

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

**Parenteral Therapies**  
Anticipated Medication Management  
 Antibiotics  
 Analgesics  
 Diuretics

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

Non-Pharmacologic Care Measures  
 Increase Fluids  
 Nutritional intake  
 Frequent voiding  
 Relaxation/distraction measures  
 Patient teaching  
 Prevent moisture  
 Proper hygiene

**NCLEX III (4):**

**Care Needs**  
What stressors might a patient with this diagnosis be experiencing?  
 Pain  
 Fear  
 Anxiety  
 Embarrassed

**Client/Family Education**

List 3 potential teaching topics/areas  
 •hydration  
  
 • hygiene  
  
 • frequent voiding

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

Multidisciplinary Team Involvement  
 (Which other disciplines do you expect to share in the care of this patient)  
 Dietician, pharmacist, laboratory, urologist/nephrologist

**Potential Patient Problems (Nursing Diagnoses)**

**To Be Completed Before the Simulation**

Anticipated Patient Problem: Impaired urinary elimination

Clinical Reasoning: UTI

Goal 1: UO  $\geq$  30mL/hr by the end of my 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 I & Os q 2 hr	Encourage adequate fluid intake q 4 hr
Assess for moisture in perineal area and techniques used for hygiene q 6 hr	Educate on proper perineal hygiene q 6 hr
Assess WBC for infection q 6 hr	Administer antibiotics as ordered
Assess for intervals of urinary elimination q 2 hr	Encourage scheduled toileting q 1 hr
Assess for PQRST of pain q 4 hr	Provide pain relieving interventions (sitz bath, heating pad, medications, relaxation/distraction techniques) q 2 hr
Assess for common risk factors r/t UTIs q 6 hr	Educate on UTI risk factor/prevention methods for UTIs q 6 hr

Goal 2: will report methods to prevent future UTIs by end of my care

**To Be Completed Before the Simulation**

Anticipated Patient Problem: Deficient fluid volume

Clinical Reasoning: UTI

Goal 1: will have a positive fluid balance by the end of my 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 fluid balance q 6 hr	Administer diuretics as ordered
Assess HR and BP q 4 hr	Encourage adequate fluid intake q 4 hr
Assess mucous membranes, skin turgor, and capillary refill q 6 hr	Administer IV fluids as ordered
Assess serum electrolytes q 6 hr	Administer electrolyte supplements as ordered
Assess level of consciousness q 6 hr	Educate on signs and symptoms of dehydration q 6 hr
Assess daily weights	Educate on monitoring intake and output q 6 hr

Goal 2: Maintain a HR and BP within normal range during my care

**To Be Completed During the Simulation:**

**Actual Patient Problem: Excess fluid volume #1**

**Clinical Reasoning: CHF, crackles in lungs, O2 88% on RA**

Goal: UO ≥ 30mL/hr by the end of my care

Met:  Unmet:

Goal: Maintain a HR and BP within normal range during my care

Met:  Unmet:

**Actual Patient Problem: Risk for shock #2**

**Clinical Reasoning: hx of urosepsis, RR 32, T-101, chills, confused**

Goal: will remain free of infection with vital signs and WBC in normal range by the end of my care Met:  Unmet:

Goal: will identify interventions to help reduce risk for infection

Met:  Unmet:

Additional Patient Problems: Impaired Skin integrity #3

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
#1		Labored breathing		Raised HOB		O2 at 88% on RA
#1		O2 at 88% on RA		Applied O2 NC 2L Educated on deep breathing		Labored breathing, SOB, restless, O2 90% on 2L NC
#1		BP- 130/94 T- 100.6 O2 90% on 2L NC		Titrate O2 NC to 4L Educated on deep breathing and coughing Administered 20mg IVP Furosemide		Labored breathing, coughing, crackles in lungs
#3		Pain 4 out of 10, "uncomfortable" Skin breakdown on coccyx		Applied barrier cream, put in bucks' traction, performed bed bath		Would reassess affected extremity and area of skin breakdown
#1, #2		O2 at 85% on 4L NC RR 32 T-101 chills UO cloudy, confused		Titrated O2 NC to 6L Raised HOB		pH 7.28 PaCO2 35, HCO3 20 (would reassess VS)

**ATI Virtual Clinical Questions and Reflection:**

- 1) Identify two members of the healthcare team collaborating in the care of this patient:
  - a.   Nurse Craig
  - b.   Nurse Debbie
- 2) What were some steps the nursing team demonstrated that promoted patient safety?
  - a. **Nurse Craig doing medication reconciliation with the team**
  - b. **Multiple nurses titrating O2 when O2 sat was low**
  - c. **Assessing for skin breakdown and complications from falls**
- 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: Besides the nurse giving little information during shift report, I feel everyone on the team utilized great communication techniques to make sure pertinent assessments were reported and addressed as well as continuity of care.
  - b. **If no**, describe: \_\_\_\_\_  
\_\_\_\_\_

## 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: I understand now the priority nursing problem was excess fluid volume from CHF. The patient was not taking their cardiac medications properly. The excess fluid volume led to respiratory problems that most of the assessments and interventions were involved around. Even though at the end of the simulation it was found that the patient was in shock and in metabolic acidosis.
- 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: Educating on proper perineal hygiene will help prevent future infections. Administering antibiotics to help resolve current infection. Providing pain relief interventions can help the patient manage the pain they are experiencing. Monitoring intake and output is very important for a patient retaining fluid.
    - ii. **If no**, describe: Encouraging fluid intake or administering IV fluids would not be helpful with a patient who has excess fluid volume. Administering electrolyte supplements is not indicated anymore now that I know the patient is not losing electrolytes. Also, the other interventions about educating the patient can also be helpful, but not priority.

- 4) After completing the scenario, what is your patient at risk for developing?
  - a. Becoming septic and metabolic acidosis
  - b. Why? Infection can be spreading into the blood and the patient is retaining fluid
- 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-aways were having the ability to think critically and act fast in clinical situations. I was going into this simulation picturing what would be going on with the patient, where it was completely different. Throwing away my preconceived notions taught me to make sure I always assess objectively and get a baseline for future assessments. It was very helpful to see how Nurse Craig handled his situation with having little information on the patient and was able to provide focused assessments, think critically about the situation to intervene correctly, and most importantly communicate with multiple members of the multidisciplinary team. I think that part in these simulations are impacting my nursing practice, that make sure proper communication and collaboration is implemented with members of the healthcare team to give the most effective care.