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Medical Diagnosis/Disease: Urinary Tract Infection

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

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

Anatomy and Physiology

Normal Structures

The upper urinary system consists of two kidneys and 2 ureters. The lower urinary system consists of a urinary bladder and urethra. Urine is formed in the kidneys, drains through the ureters to be stored in the bladder, then passes out of the body through the urethra. The kidneys are the principal organs of the urinary system. Their functions are to regulate the volume and composition of extracellular fluid and excrete waste products from the body. They also function to control BP, make erythropoietin, activate vitamin D, and regulate acid-base balance. The paired kidney bean shaped organs are located retroperitoneally on either side of the vertebral column. An adrenal gland sits on top of each kidney. Each kidney is surrounded by fat to allow for cushioning, support, and to help maintain positioning. A capsule covers the surface of each kidney which protects the kidney and is used as a shock absorber. The hilus on the medial side allows an entry site for the renal artery and nerves and as an exit for the renal vein and ureter. The tissue of the kidney is called the parenchyma, the outer layer is the cortex, and the inner layer is the medulla. The nephron is the functional unit of each kidney, which is composed of the glomerulus, Bowman capsule, proximal convoluted tubule, loop of Henle, distal convoluted tubule, and connecting tubules. Several collecting tubules join to form a single collecting duct, eventually emptying into a papilla into a minor calyx. Blood is filtered in the glomerulus. The amount of blood filtered each minute by the glomeruli is the GFR (glomerular filtration rate). The ureters are tubes that carry urine from the renal pelvis to the bladder. The bladder is a reservoir and eliminates waste products. The trigone is a triangular area formed by the two ureteral openings; it is attached to the pelvis by many ligaments. **The lower urinary system is composed of the ureters, bladder, and urethra.** The ureters are tubes that carry urine from the renal pelvis to the bladder. The narrow area where each ureter joins

Pathophysiology of Disease

Urinary tract infections are infections of the urinary tract. Escherichia coli is the most common pathogen found. UT''s can be described as upper or lower according to its position in the urinary system. A UTI can also be classified as uncomplicated or complication. Uncomplicated occur in a normal urinary tract without abnormalities and complicated occurs with an underlying disease or with a structural problem in the urinary tract. The urinary tract above the urethra is sterile. There are several mechanical and physiologic defense mechanisms which are normal voiding with complete bladder emptying, UVJ competence, and ureteral peristaltic activity that propels urine toward the bladder. Urine has antibacterial properties due to its low pH. The organisms that cause UTIs are normally found in the perineum. They are introduced into the body via the ascending route from the urethra. Catheterizations and cystoscopic exams predispose an individual to UTIs. UTIs can result from hematogenous transmission in which blood borne bacteria invade the kidneys, ureters, bladder from elsewhere in the body. UTIs are the most common healthcare associated infection d/t the use of indwelling catheters (CAUTIs).

Anticipated Diagnostics

Labs

- Dipstick urine analysis

- urine cx (see what bacteria is present)

- CBC (WBC for infection)

-BMP

Additional Diagnostics

- US
- CT
- MRI
- Cystoscopy showing urinary tract abnormalities
- Excretory urography

cystourethroscopy

the renal pelvis is the ureteropelvic junction. The ureters insert into either side of the bladder base at the ureterovesical junctions. The bladder contracts against its base, ensuring UVJ closure and preventing urine reflux through the junction. The urinary bladder is located behind the symphysis pubis and anterior to the vagina and rectum. The primary functions are to serve as a reservoir for urine and to eliminate waste products. The trigone is the triangular area formed by the two ureteral openings and bladder neck at the base of the bladder. The bladder is lined by transitional cell epithelium referred to as the urothelium. The urethra is a small tube that incorporates the smooth muscle of the bladder neck and extends to the striated muscle of the external meatus. The primary functions of the urethra are to control voiding and serve as a conduit for urine from the bladder to the outside of the body during voiding. The ureterovesical unit is composed of the bladder, urethra, and pelvic floor muscles. Voluntary control of this unit is defined as continence.

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

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

Contributing Risk Factors

- **previous UTI**
- **pregnancy**
- **age**
- **poor hygiene**
- **obesity**
- **indwelling catheter**
- **HIV**
- **Prior injury to urinary tract**
- **Urine retention**

Signs and Symptoms

- **Polyuria**
- **Burning sensation**
- **Urine retention**
- **Kidney pain**
- **Hematuria**
- **Urethra pain**
- **Foul-smelling urine**
- **Cloudy urine**
- **Voiding less than 30 mL/hr**
- **Fever**
- **Chills**

Possible Therapeutic Procedures

Non-surgical

- **encourage fluids**
- **encourage voiding q 2 hr**
- **encourage cranberry juice**
- **abx**
- **urinary analgesics**
- **limit indwelling catheters if possible**
- **warm compresses**

Surgical

Prevention of Complications

(What are some potential complications associated with this disease process)

- **recurrent UTIs**
- **kidney damage**
- **urosepsis**
- **damage to urinary tract lining**
- **sepsis**
- **kidney abscess**
- **acute bacterial prostatitis**
- **narrowed urethra**

NCLEX IV *(6)*: **Pharmacological and Parenteral Therapies**

Anticipated Medication Management

- **NSAIDs**
- **Analgesics**
- **abx**

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

Non-Pharmacologic Care Measures

- adequate fluid intake
- turn q 2 hr
- apply heating pad to suprapubic area
- sitz bath

NCLEX III *(4)*: **Psychosocial/Holistic Care Needs**

What stressors might a patient with this diagnosis be experiencing?

- **Anxiety**
- **Fear of dependence**
- **Financial burdens**
- **Confusion/irritability**

Client/Family Education

List 3 potential teaching topics/areas

Ÿ Adequate hydration is essential for helping to clear the infection.

Ÿ Urinate as frequently as possible.

Ÿ It is important to take full prescribed abx to clear infection and prevent it from reoccurring.

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)

- Urologist
- Case management

Potential Patient Problems (Nursing Diagnoses)

To Be Completed Before the Simulation

Anticipated Patient Problem: Altered Urinary Elimination

Clinical Reasoning: UTI, low urine output

Goal 1:Pt will be AOx 4 during my time of care.

Relevant Assessments (Prework) What assessments pertain to your patient's problem? Include timeframes.	**Multidisciplinary Team Intervention** (Prework) What will you do if your assessment is abnormal?
Assess mental status q 4hr	Reorient to person, place, time and situation PRN
Assess urine output q 6hr	Provide hat to measure output q 8 hr
Assess for dehydration q 4hr	Provide 500mL of water q 6hr
Assess WBC count and UA q 8hr	Administer Levofloxacin 250mg q 24 hr
Assess urine characteristics q 4hr and PRN	Encourage urinary elimination q 4hr
Assess oral temperature q 4hr	Provide cool washcloth to forehead PRN

Goal 2: Pt will have a urine output of at least 360 mL by the end of my shift.

To Be Completed Before the Simulation

Anticipated Patient Problem: Acute Pain

Clinical Reasoning: pain level 7/10, burning sensation, grimacing and guarding present

Goal 1:Pain level will a 2/10 or lower by the end of my time of care.

Relevant Assessments (Prework) What assessments pertain to your patient's problem? Include timeframes.	**Multidisciplinary Team Intervention** (Prework) What will you do if your assessment is abnormal?
Assess HR and BP q4hr and PRN	Encourage meditation and relaxation techniques q8 hr
Assess current pain characteristics q 4 hr	Apply heating pad to suprapubic area PRN
Assess pain goal q 12 hr	Administer lorazepam IV 4 mg PRN
Assess for grimacing and guarding q 4 hr	Administer acetaminophen 325mg PO q6 hr and PRN
Assess current pain level q 2hr	Administer opioid analgesic as ordered
Assess for alleviating and aggravating factors q 8hr	Educate on importance of avoiding triggers q 8hr

Goal 2:Pt will verbalize the importance of taking medication before pain level is over a 5/10.,

To Be Completed During the Simulation:

Actual Patient Problem: Impaired Gas Exchange

Clinical Reasoning:SpO2 85% on 4L NC, SOB, expiratory wheezing

Goal:SpO2 will be greater than 90% during my time of care. Met: ☐ Unmet:☐

Goal:Pt will be on no more than 2 L NC by the end of my care. Met: ☐ Unmet:☐

Actual Patient Problem: Decreased Cardiac Output

Clinical Reasoning:crackles bilaterally posteriorly, hx of CHF, low urine output, HR 90, currently taking digoxin 0.25mg and furosemide 20mg

Goal: Pt will have a urine output of at least 30 mL/hr Met: ☐ Unmet:☐

Goal:Pt will have clear lung sounds by the end of my time of care. Met: ☐ Unmet:☐

Additional Patient Problems: Impaired skin integrity, risks for falls, risk for electrolyte imbalance

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
Impaired gas exchange	0730	SOB, SpO2 88% on RA	0745	Raised HOB, applied 2L NC, encouraged deep breathing	0745	SpO2 90% on 2L, RR 24, HR 90
Impaired gas exchange	0745	Temp 100.6, RR 24, BP 130/94	0830	Increased oxygen to 4L NC	0834	SpO2 94% on 4L
Decreased cardiac output	0900	Neighbor brought in several medications from client's home	0917	Medication reconciliation with pharmacist	0930	Medications added to patient chart
Decreased cardiac output	1000	Chills, crackles b/l in lungs posteriorly, coughed up sputum	1030	Administer furosemide 20 mg IV bolus and Digoxin 0.25mg PO	1130	Low urine output
Risk for falls	1730	Fell OOB, left hip fx, Pain level 4/10	2000	Applied Buck's traction, Administered acetaminophen 325 mg PO	2030	Pain level 4/10
Impaired skin integrity	2040	Erythema and ulcer on coccyx, stage 2 pressure injury	2045	Provided bed bath	2050	Linens clean and dry

Impaired gas exchange	2200	SOB, SpO2 85% on 4L, Temp 101, RR 32 and shallow, chills, low urine output	2210	Increased oxygen to 6L NC	2230	SOB, expiratory wheezes, lung sounds clear
Risk for electrolyte imbalance	2300	pH 7.28, PaCO2 35, HCO3 20	2300	Notified provider	2330	In metabolic acidosis

ATI Virtual Clinical Questions and Reflection:

1) Identify two members of the healthcare team collaborating in the care of this patient:
    a. **__Debbie, RN_____**
    b. **__Craig, RN_____**
2) What were some steps the nursing team demonstrated that promoted patient safety?
    a. **Not moving the client's leg while in Buck's traction or changing the equipment. ___**
    b. **_Contacting the provider when distributive shock was suspected with chills, fever, low urine output, and SpO2 of 85%. _____**
    c. **_Consulted with the pharmacist when multiple medications were brought in by the neighbor. _____**
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: _I believe the healthcare workers utilized therapeutic communication by asking the patient to describe their concerns with Buck's traction before applying it. _____
    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 now understand the priority problem to be impaired gas exchange. _____**
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: ___Yes, some other interventions that could have been done were heat to the suprapubic region for any pain or discomfort and providing 500mL of water for the patient to drink. _____

ii. If **no**, describe:

_____

_____

4) After completing the scenario, what is your patient at risk for developing?

   a. __The patient is at risk for developing electrolyte imbalances. _____

   b. Why? __The patient has metabolic acidosis and is not drinking water or eating food which can cause the electrolytes to become high or low. _____

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

   _____My biggest takeaway from participating in the care of this patient is the need of communication between the provider and the registered nurse. Communication is a major role that ensures patient safety and that the patient receives the right orders and medications that are needed. It is critical that communication is shown within the interprofessional teams to ensure the patient is taken care of in the most effective way possible. This impacted my nursing practice by showing the importance of checking vital signs as often as needed to ensure that the patient can breathe and receive proper treatment in a timely manner.

   _____

   _____

   _____