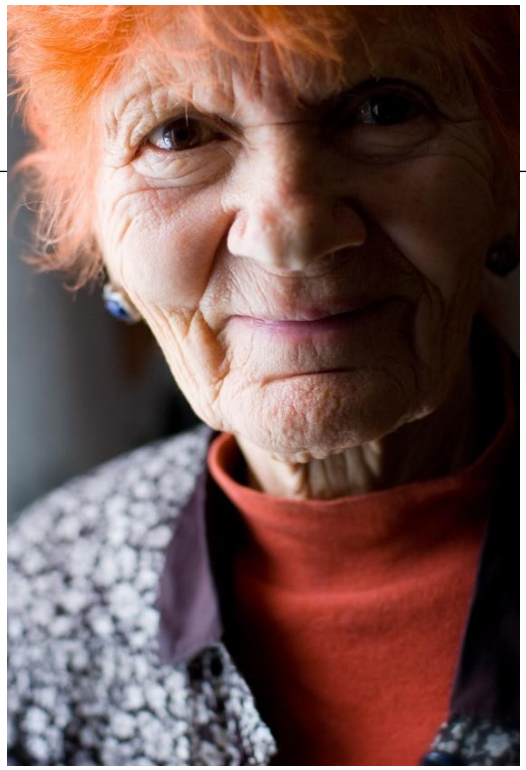
Urinary Tract Infection/Urosepsis

Primary Concept
Infection
Interrelated Concepts (In order of emphasis)
1. Perfusion



Jean Kelly, 82 years old

UNFOLDING Reasoning Case Study: STUDENT

Sepsis History of Present Problem:

Jean Kelly is an 82-year-old woman who has been feeling more fatigued the last three days and has had a fever the last twenty-four hours. She reports a painful, burning sensation when she urinates as well as frequency of urination the last week. Her daughter became concerned and brought her to the emergency department (ED) when she did not know what day it was. She is mentally alert with no history of confusion. While taking her bath today, she was weak and unable to get out of the tub and used her personal life alert button to call for medical assistance.

Personal/Social History:

Jean lives independently in a senior apartment retirement community. She is widowed and has two daughters who are active and involved in her life.

What data from the histories are important and RELEVANT and have clinical significance for the nurse?

RELEVANT Data from Present Problem:	**Clinical Significance:**
Increased fatigue Fever for last 24 hours Painful, burning feeling with urination along with frequency New onset confusion New onset weakness	Increased fatigue and fever could indicate bacterial infection. Painful, burning urination could indicate UTI New onset confusion and weakness in the elderly could indicate a UTI. If left untreated complications could develop.
RELEVANT Data from Social History:	**Clinical Significance:**
Lives alone in a senior retirement community.	Although the client's daughters are active in her life, the client may not be getting the nutrition or hydration she needs on a daily basis.

What is the RELATIONSHIP of your patient's past medical history (PMH) and current meds?
(Which medications treat which conditions? Draw lines to connect)

PMH:	**Home Meds:**	**Pharm. Classification:**	**Expected Outcome:**
Diabetes type 2 #3 Hyperlipidemia #4 Hypertension (HTN) #5, #6, #7 Gout #1	1. Allopurinol 100 mg PO bid 2. ASA 81 mg PO daily 3. Pioglitazone 15 mg PO daily 4. Simvastatin 20 mg PO daily 5. Metoprolol 25 mg PO bid 6. Lisinopril 10 mg PO daily 7. Furosemide 20 mg PO daily 8. Potassium chloride 20 mEq PO daily	-Antigout -NSAIDs -Antidiabetic -Antilipemics -beta blocker/ Antihypertensive -ACE inhibitor/ antihypertensive -Loop diuretic/ antihypertensive -Potassium supplement	Reduce uric acid production -decrease pain -lower blood glucose -to reduce cholesterol levels -to decrease BP -to decrease BP -to decrease BP -to prevent hypokalemia

One disease process often influences the development of other illnesses. Based on your knowledge of pathophysiology, (if applicable), which disease likely developed FIRST that then initiated a "domino effect" in

their life?

- Circle what PMH problem started **FIRST**: Hyperlipidemia
- Underline what PMH problem(s) **FOLLOWED** as dominoes: Hypertension-Diabetes-Gout

Patient Care Begins:

Current VS:	**P-Q-R-S-T Pain Assessment (5th VS):**	
T: 101.8 F/38.8 C (oral)	**P**rovoking/Palliative:	Nothing/Nothing
P: 110 (regular)	**Q**uality:	Ache
R: 24 (regular)	**R**egion/Radiation:	Right flank
BP: 102/50	**S**everity:	5/10
O2 sat: 98% room air	**T**iming:	Continuous

The nurse recognizes the need to validate his/her concern of fluid volume deficit and performs a set of orthostatic VS and obtains the following:

Position:	**HR:**	**BP:**
Supine	110	102/50
Standing	132	92/42

What VS data are RELEVANT and must be recognized as clinically significant by the nurse?

RELEVANT VS Data:	**Clinical Significance:**
Temperature Heart rate/pulse Blood pressure	Elevated temp could suggest infection Elevated could indicate a cardiac condition when combined with low blood pressure, but can also indicate dehydration.

Current Assessment:	
GENERAL APPEARANCE:	Resting comfortably, appears in no acute distress
RESP:	Breath sounds clear with equal aeration bilaterally, non-labored respiratory effort
CARDIAC:	Pink, warm and dry, no edema, heart sounds regular-S1S2, pulses strong, equal with palpation at radial/pedal/post-tibial landmarks
NEURO:	Alert and oriented x2-is not consistently oriented to date and place, c/o dizziness when she sits up
GI:	Abdomen soft/nontender, bowel sounds audible per auscultation in all four quadrants
GU:	Dysuria and frequency of urination persists, right flank tenderness to gentle palpation
SKIN:	Skin integrity intact, lips dry, oral mucosa tacky dry

What assessment data are RELEVANT and must be recognized as clinically significant by the nurse?

RELEVANT Assessment Data:	**Clinical Significance:**

Alert and oriented x2 Dysuria and frequency of urination Right flank tenderness Dry lips and oral mucosa	Changed from family's knowledge Condition change, could indicate UTI Could indicate pyelonephritis Could indicate dehydration

Radiology Reports: Chest x-ray

What diagnostic results are RELEVANT and must be recognized as clinically significant by the nurse?

RELEVANT Results:	Clinical Significance:
No infiltrates or other abnormalities. No changes from last previous	The client does not appear to have fluid accumulation in the lungs. No indications of pneumonia present.

Lab Results:

What lab results are RELEVANT and must be recognized as clinically significant by the nurse?

Complete Blood Count (CBC):	Current:	High/Low/WNL?	Previous:
WBC (4.5-11.0 mm 3)	13.2	High	8.8
Hgb (12-16 g/dL)	14.4	WNL	14.6
Platelets (150-450x 103/µl)	246	WNL	140
Neutrophil % (42-72)	93	High	68
Band forms (3-5%)	2	Low	1

What lab results are RELEVANT and must be recognized as clinically significant by the nurse?

RELEVANT Lab(s):	Clinical Significance:	TREND: Improve/Worsening/Stable:
WBC Neutrophil Band forms	Indicates infection Indicates bacterial infection Indicates increased immature neutrophils	Worsening Worsening Worsening

Basic Metabolic Panel (BMP):	Current:	High/Low/WNL?	Previous:
Sodium (135-145 mEq/L)	140	WNL	138
Potassium (3.5-5.0 mEq/L)	3.8	WNL	3.9

Glucose (70-110 mg/dL)	184	High	128
BUN (7 - 25 mg/dl)	35	High	14
Creatinine (0.6-1.2 mg/dL)	1.5	High	1.1

RELEVANT Lab(s):	Clinical Significance:	TREND: Improve/Worsening/Stable:
Glucose BUN Creatinine	Elevates in presence of infections Could indicate dehydration or AKI Could indicate dehydration or AKI	Worsening Worsening Worsening

Misc. Labs:	Current:	High/Low/WNL?	Previous:
Magnesium (1.6-2.0 mEq/L)	1.8	WNL	1.9
Lactate (0.5-2.2 mmol/L)	3.2	High	n/a

RELEVANT Lab(s):	Clinical Significance:	TREND: Improve/Worsening/Stable:
Lactate	Indicates the severity of the disease	Unsure if worsening or improving due to ko previous lab value.

Urine Analysis (UA):	Current:	ABNL/WNL?	Previous:
Color (yellow)	Yellow	WNL	Yellow
Clarity (clear)	Cloudy	ABNL	Clear
Specific Gravity (1.015-1.030)	1.032	ABNL	1.010
Protein (neg)	2+	ABNL	1+
Glucose (neg)	Neg	WNL	Neg
Ketones (neg)	Neg	WNL	Neg
Bilirubin (neg)	Neg	WNL	Neg
Blood (neg)	Neg	WNL	Neg
Nitrite (neg)	Pos	ABNL	Pos
LET (Leukocyte Esterase) (neg)	Pos	ABNL	Pos
MICRO:			
RBC's (<5)	1	WNL	0
WBC's (<5)	>100	ABNL	3
Bacteria (neg)	LARGE	ABNL	Few
Epithelial (neg)	Few	ABNL	Few

RELEVANT Lab(s):	Clinical Significance:	TREND: Improve/Worsening/Stable:
UA	Indicates a UTI	Worsening

Lab Planning: Creating a Plan of Care with a PRIORITY Lab:

Lab:	Normal Value:	Clinical Significance:	Nursing Assessments/Interventions Required:
Lactate		Indicates that the UTI is	Treatment should focus on the underlying cause. If the

Value: **3.2**	**Critical Value:**	severe	UTI is treated and resolved the Lactate levels should return to normal.

Lab:	Normal Value:	Clinical Significance:	Nursing Assessments/Interventions Required:
Creatinine **Value:** **1.5**	**Critical Value:**	This could indicate dehydration or AKI.	Increase fluids, obtain an order for IV fluids if necessary and encourage oral intake of fluids. Also hold any diuretic medications at this time.

Clinical Reasoning Begins…

1. What is the primary problem that your patient is most likely presenting?

The patient is presenting with UTI.

2. What is the underlying cause/pathophysiology of this primary problem?

The UTI could be caused by not consuming enough fluids, improper hygiene, or not completely emptying the bladder.

Collaborative Care: Medical Management

Care Provider Orders:	Rationale:	Expected Outcome:
Establish peripheral IV	-To be able to infuse fluids and administer medications.	-IV access obtained
0.9% NS 1000 mL IV bolus	-Due to the dehydration, to prevent further kidney injury	-To rehydrate the client
Acetaminophen 650 mg	-To reduce the fever and pain.	-See a decrease in temperature.
Ceftriaxone 1g IVPB…after blood/urine cultures obtained	-To eliminate the infection	-Infection clears
Morphine 2 mg IV push every 2 hours prn-pain	-To control severe pain reported by the client	-Pain is eliminated.

PRIORITY Setting: Which Orders Do You Implement First and Why?

Care Provider Orders:	Order of Priority:	Rationale:
• Establish peripheral IV	#1	-Without IV access fluids or medications will not be able to be administered.
• 0.9% NS 1000 mL IV bolus	#2	-The client is dehydrated, giving fluids will allow more perfusion of blood and easier administration of medications.
• Acetaminophen 650 mg	#4	-Although fever should not be overlooked, the reason for the fever should be addressed first.
• Ceftriaxone 1g IVPB… after blood/urine cultures obtained	#3	-Eliminating the infection will eliminate other complications, such as fever and pain.
• Morphine 2 mg IV push every 2 hours prn-pain	#5	-Administration of Tylenol may reduce the pain along with fever, Morphine may not be needed.

Medication Dosage Calculation:

Medication/Dose:	Mechanism of Action:	Volume/time frame to Safely Administer:	Nursing Assessment/Considerations:
Ceftriaxone 1g IVPB	Inhibits cell-wall synthesis, promoting osmotic instability, usually bactericidal.	**50 ml** **Hourly rate IVPB:**	The client should be monitored for superinfection. Monitor IV site for discomfort.

Collaborative Care: Nursing

3. What nursing priority will guide your plan of care? *(if more than one-list in order of PRIORITY)*

-Monitor the client during the antibiotic therapy for any superinfections, along with close monitoring of blood glucose.

4. What interventions will you initiate based on this priority?

Nursing Interventions:	Rationale:	Expected Outcome:

- Monitoring bowel habits. -Monitoring blood glucose levels. -Encourage fluids	-C. diff is a superinfection that can cause infectious diarrhea. -Antibiotics can increase blood glucose levels and treatment should be altered to manage levels. -To prevent dehydration and kidney injury which will decrease risk of UTI.	-The client will retain normal bowel habits. -Blood glucose level will remain stable throughout treatment. -The client will remain adequately hydrated as evident by adequate urine production.

5. ***What body system(s) will you most thoroughly assess based on the primary/priority concern?***
I will assess the blood glucose levels.

6. ***What is the worst possible/most likely complication to anticipate?***
Blood glucose levels can increase to the point of coma. Uncontrolled blood sugars can also cause other complications including cardiac issues.

7. ***What nursing assessment(s) will you need to initiate to identify this complication EARLY if it develops?***
Constant blood glucose monitoring before meals, at bedtime and fasting blood glucose.

8. ***What nursing interventions will you initiate if this complication develops?***
Call provider with information and assessment, recommend interventions.

9. ***What psychosocial needs will this patient and/or family likely have that will need to be addressed?***
The client may need a caregiver to come to her residence a few times a week to assess if the client is getting adequate nutrition, hydration and if the client is taking medications properly. The client's daughters may also feel better knowing that the client has a trained personal visiting a few times a week.

10. ***How can the nurse address these psychosocial needs?***
The nurse can discuss with the case manager any concerns she may have. The case manager can also arrange for a home nurse to visit the client a few times a week.

Evaluation:

Evaluate the response of your patient to nursing and medical interventions during your shift. All physician orders have been implemented that are listed under medical management.

Two Hours Later…

Current VS:	**Most Recent:**
T: 101.4 F/38.6 C (oral)	**T:** 101.8 F/38.8 C (oral)
P: 116 (regular)	**P:** 110 (regular)

R: 22 (regular)	**R:** 24 (regular)
BP: 98/50	**BP:** 102/50
O2 sat: 98% room air	**O2 sat:** 98% room air

Current Assessment:	
GENERAL APPEARANCE:	Resting comfortably, appears in no acute distress
RESP:	Breath sounds clear with equal aeration bilaterally, non-labored respiratory effort
CARDIAC:	Color flushed. Skin is warm and dry centrally, but upper/lower extremities are mottled in appearance and cool to touch, heart sounds regular-S1S2, pulses strong, equal with palpation at radial/pedal/post-tibial landmarks
NEURO:	Alert and oriented x2-is not consistently oriented to date and place
GI:	Abdomen soft/nontender, bowel sounds audible per auscultation in all four quadrants
GU:	No urine output the past two hours.
SKIN:	Skin integrity intact

1. What clinical data are RELEVANT and must be recognized as clinically significant?

RELEVANT VS Data:	**Clinical Significance:**
-Pulse of 116 -Blood pressure 98/50	Elevated pulse along with the decreased blood pressure could indicate a possible cardiac condition, such as A-fib.
RELEVANT Assessment Data:	**Clinical Significance:**
-Upper/lower extremities are mottled and cool to the touch. -No urine output in the past 2 hours	The extremities suggest that adequate perfusion is not occuring. The absence of urine could support this suggestion because if the kidneys are not receiving adequate blood perfusion, then they will begin to shut down and therefore will not produce urine.

1. ***Has the status improved or not as expected to this point?***
   Patient status has not improved as expected to this point.

2. ***Does your nursing priority or plan of care need to be modified in any way after this evaluation assessment?***
   Yes

3. ***Based on your current evaluation, what are your nursing priorities and plan of care?***

Slow the IV infusion down.
Call the physician for an order to straight cath.
Also inform the physician of the extremity mottling and cool feeling.

Because you have not seen the level of improvement you were expecting in the medical interventions, you decide to update the physician and give the following SBAR:

Situation:
-82 y/o female with elevated temperature, elevated pulse and decreased blood pressure. Upper and lower extremities show mottling appearance and are cool to the touch. The client has had no urine output in the last 2 hours.
Background:
Presented with dysuria and frequency with urination, along with new onset confusion. The client had an elevated temperature, decreased blood pressure and elevated pulse upon admission.
Assessment:
There appears to be no adequate perfusion to the extremities. No urine output has me concerned that the kidneys may not be getting perfusion as well.
Recommendation:
Recommend a Foley to monitor urine output.

The physician agrees with your concerns and decides to repeat the 0.9% NS bolus of 1000 mL and insertion of Foley catheter. After one hour this has completed and you obtain the following set of VS:

Current VS:	**Most Recent:**
T: 100.6 F/38.1 C (oral)	**T:** 101.4 F/38.6 C (oral)
P: 92 (regular)	**P:** 116 (regular)
R: 20 (regular)	**R:** 22 (regular)
BP: 114/64 MAP: 81	**BP:** 94/48 MAP: 63
O2 sat: 98% room air	**O2 sat:** 98% room air

Current Assessment:	
GU:	200 mL cloudy urine in bag

1. ***Has the status of the patient improved or not as expected to this point?***
   Yes

2. ***What data supports this evaluation assessment?***
   Temperature has decreased, pulse has decreased and blood pressure has increased.

Your patient, who is still in the emergency department, is now being transferred to the intensive care unit (ICU) for close monitoring and assessment. Effective and concise handoffs are essential to excellent care and if not done well can adversely impact the care of this patient. You have done an excellent job to this point, now finish strong and give the following SBAR report to the nurse who will be caring for this patient:

Situation:

Name/age: Jean Kelley 82 y/o female

BRIEF summary of primary problem:
Daughter brought her to the ED after % dysuria and frequency with urination, along with new onset confusion.

Day of admission/post-op #: 4/15/20

Background:

Primary problem/diagnosis:
Urosepsis

RELEVANT past medical history:
Patient has history of Diabetes, Hypertension, Hyperlipidemia, and gout

RELEVANT background data:
Lives alone in a senior apartment retirement community.

Assessment:

Most recent vital signs:
temp 100.6 F (oral); P 92 (regular); R 20 (regular); BP 114/64 MAP: 81;
O2 98% RA

RELEVANT body system nursing assessment data:
Skin is warm and dry centrally, but upper/lower extremities are mottled in appearance and cool to touch. Patient is alert and oriented x2, is not consistently oriented to date and place

RELEVANT lab values:

BUN 35	Lactate 3.2
Creatinine 1.5	Urine cloudy

How have you advanced the plan of care?
Foley cath in place due to no urine production.

Patient response:
Patient responding to fluids and antibiotic ceftriaxone

INTERPRETATION of current clinical status (stable/unstable/worsening):
stable

Recommendation:

Suggestions to advance plan of care:
Continue fluids, antibiotic therapy and monitor intake/output.
Continue to monitor extremities for perfusion.

Education Priorities/Discharge Planning

1. ***What will be the most important discharge/education priorities you will reinforce with Jean's medical condition to prevent future readmission with the same problem?***

   Adequate consumption of fluids is important, along with proper hygiene practices.

2. ***What are some practical ways you as the nurse can assess the effectiveness of your teaching with this patient?***

   By having the patient perform return demonstration to the nurse.

Caring and the "Art" of Nursing

1. ***What is the patient likely experiencing/feeling right now in this situation?***

   The patient may be feeling anxious due to the added hospital stay. She may also be feeling fear due to her current situation.

2. ***What can you do to engage yourself with this patient's experience, and show that he/she matters to you as a person?***

   By asking this patient if she understands her situation and to actively listen to her. Make sure the patient has the full attention of the nurse.

Use Reflection to THINK Like a Nurse

Reflection-IN-action (Tanner, 2006) is the nurse's ability to accurately interpret the patient's response to an intervention in the moment as the events are unfolding to make a correct clinical judgment.

1. ***What did I learn from this scenario?***

   I learned to use critical thinking to solve current issues that arise.

2. ***How can I use what has been learned from this scenario to improve patient care in the future?***
   By reviewing all information available at the time, along with assessing the patient.