

Scenario Name: Blood Transfusion/Management of a Central Line Catheter			Learner Preparation Exercise:
High Fidelity	X	Low Fidelity	Static Model
Level: Advanced			Review:
Learning Objectives:			<ol style="list-style-type: none"> 1. Post-op assessment 2. Procedure for administration of blood transfusions 3. Possible complications to transfusion administration 4. Central line management
<ol style="list-style-type: none"> 1. Recognize that a client taking aspirin is at risk for developing a peptic ulcer and gastric bleeding. 2. Discuss surgical treatment of gastric bleeding associated with a peptic ulcer. 3. Recognize the parameters for administration of blood and when it is appropriate. 4. Complete the paperwork required for administration of a blood transfusion. 5. Prepare a patient for blood transfusion. 6. Recognize and respond to a hemolytic transfusion reaction. 7. Perform a central line dressing change. 8. Verbalize management of a central line. 			Healthcare Provider's Orders:
Initial Subjective Data:			<ol style="list-style-type: none"> 1. Type and Crossmatch for 2 units PRBC's 2. Transfuse with 2 units PRBC's 3. 5/0.45 Sodium Chloride 100 ml/hr
<p>63y/o admitted three days previously for endoscopy of upper GI and colon. She had been experiencing postprandial epigastric pain, appearing soon after eating. This pain is accompanied by flatulence, dyspepsia, nausea and vomiting. She has lost 15 pounds in the previous 3-4 months. History is negative for hematemesis or passage of large amounts of blood from the rectum. Stools are positive for blood. Medication includes esomeprazole (Nexium), aspirin and caffeine (Anacin) and acetaminophen (Tylenol). A subclavian line was inserted prior to surgery. Her scope revealed a gastric outlet obstruction, possibly secondary to peptic ulcer disease. After the scope she subsequently underwent an Antrectomy and Vagotomy with Bilroth II reconstruction and umbilical hernia repair. It is now day 3 after surgery and insertion of central line.</p> <p>Prior to surgery her H/H was 14.2/42.6. Immediately after surgery her H/H was 12.4/37.6. Her H/H is now 8.1/23.9. The physician has ordered a transfusion of 2 units of packed red blood cells.</p>			

Supplies:

IV Supplies		Dressing/Drain Supplies	
IV Pump	1	Central line dressing kit	1
250 ml Normal Saline	1		
1000 ml Normal Saline	1		
IV infusion tubing	1		
Packed red blood cells with appropriate unit information	1		
Triple lumen cath	2		
Blood infusion tubing	1		
Medication Supplies		GI/GU Supplies	
		Abdominal dressing	1
Oxygen Supplies		Miscellaneous	
Nasal cannula	1	Blood permits	1 set
O2 meter	1	Lab draw equipment	1 set
Pulse oximeter	1	Urine specimen cup	1
		Monitors Required	
		Blood pressure cuff	1
		Thermometer	1

Set-up Notes:

1. Manikin with central line in right subclavian.
2. Maintenance fluids infusing.
3. Abdominal dressing.

References:

Arrow CVC Poster Plus. www.arrowintl.com

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Dechanty, K. M. & Myers, F. E. (2007). Infection control survey report. *Nursing*, 2007, 37(6), 28-37.

Hurst, S. M. & Keith, B. K. (2005). Innovative solutions: a collaborative effort of critical care oncology. *Dimensions of Critical Care Nursing*, 24(1), 37-40.

Potter, P. A. & Perry, A. G. (2009). *Fundamentals of Nursing*, 7th Ed., Mosby: Elsevier, Canada.

Scenario Progression: 3 days post-op and central line insertion. You have just received the morning lab. You have called the physician and received an order to transfuse with packed red blood cells.

Initial State		Body System Assessment	Patient Finding
VS: 98.6-92-18 BP: 120/62 Pulse Ox: 98%		Neurological Sensory	Awake, alert, oriented X 4. Complains of fatigue when ambulating. Pain 2/10.
Sinus Rhythm: 92 /min Auscultation Sounds: Left Lung: Clear Right Lung: Clear Heart: Normal sinus rhythm Bowel Sounds: hypoactive		Cardiac	Regular rhythm. Normal heart sounds. Capillary refill 3 secs. +2 peripheral pulses.
Airway: Open Monitor Controls SpO2: 98% Tperi: 98.6 F Respiratory Rate: 18 /min Blood Pressure: 120/62		Pulmonary	Bilateral chest expansion. Slight shortness of breath on ambulation. No chest pain. Breath sounds clear.
		Musculoskeletal	Feels weak.
		Gastrointestinal (GI)	Incision clean and dry. Abdomen flat/tender. Bowel sounds hypoactive in all quadrants.
		Genitourinary (GU)	Clear yellow urine.
		Skin/Wound	Color pale/cool. No numbness or tingling. Central line in right subclavian clean, no drainage.
		Vocal Complaint	"I feel weak"
		Lab/Diagnostic Results	H/H 8.1/23.9
Action by Participant			
Complete am assessment/Orders Type & Cross			
The PRBC's are ready	Go to Frame 1		
Facilitator Notes: Review transfusion orders Review chart for H & H, allergies, type and crossmatch Teach patient and obtain permits			

Scenario Progression: The blood has been picked up from the lab for transfusion.

Frame 1	
VS: 98.6-88-18 BP: 118/64 Pulse Ox: 98%	
Sinus Rhythm: 88 /min Auscultation Sounds: Left Lung: Clear Right Lung: Clear Heart: Normal Sinus Rhythm Bowel Sounds: Hypoactive	
Airway: Open Monitor Controls SpO2: 98% Tperi: 98.6 F	
Respiratory Rate: 18 /min Blood Pressure: 118/64	
Action by Participant	
Obtain pre-transfusion vital signs.	Go to Frame 2
Start transfusion.	

Body System Assessment	Patient Finding
Neurological Sensory	Awake, alert, oriented X 4. Complains of fatigue when ambulating.
Cardiac	Regular rhythm. Normal heart sounds. Capillary refill 3 secs. +2 peripheral pulses.
Pulmonary	Bilateral chest expansion. Slight shortness of breath on ambulation. No chest pain. Breath sounds clear.
Musculoskeletal	Feels weak.
Gastrointestinal (GI)	Incision clean and dry. Abdomen flat/tender. Bowel sounds hypoactive in all quadrants.
Genitourinary (GU)	Clear yellow urine.
Skin/Wound	Color pale/cool. No numbness or tingling. Central line in right subclavian clean, no drainage.
Vocal Complaint	"I feel weak"
Lab/Diagnostic Results	

Facilitator Notes:

General Guidelines:

1. Obtain blood products just prior to starting transfusion. IV (18-20 gauge) needs to be assessed for patency prior to picking the blood up from the lab. Fluids to be Normal Saline. Do not use other solutions, especially containing dextrose. The dextrose will cause coagulation of donor blood.
2. Do not put blood bags in the unit refrigerator.
3. Blood products need to be infused within 4 hours of receipt from the blood bank (lab) to decrease risk of contamination and sepsis.
4. Watch patient carefully for first half hour. Most acute transfusion reactions occur during this time period.
5. Monitor vital signs per facility policy.
6. Check blood bag with another licensed personnel. You will check the chart, blood bag and patient at bedside.

Scenario Progression: It is now 15 minutes after you started the transfusion.

Frame 2		Body System Assessment	Patient Finding
VS: 101-110-24 BP: 90/60 Pulse Ox: 94% Sinus Rhythm: 110 /min Auscultation Sounds: Left Lung: Clear Right Lung: Clear Heart: Sinus tachycardia Bowel Sounds: Hypoactive Airway: Open Monitor Controls SpO2: 94% Tperi: 101 F Respiratory Rate: 24 /min Blood Pressure: 90/60		Neurological Sensory	Anxious
		Cardiac	Sinus Tachycardia. Peripheral pulses weak.
		Pulmonary	Bilateral expansion. Clear breath sounds.
		Musculoskeletal	Low back pain, weak.
		Gastrointestinal (GI)	No change.
		Genitourinary (GU)	No change.
		Skin/Wound	Flushed.
		Vocal Complaints	"I feel chills" or "my back hurts"
		Lab/Diagnostic Results	
Action by Participant			
Stop Transfusion	Go to Frame 3		

Facilitator Notes:
 Recognize that patient is demonstrating S/S of Acute hemolytic transfusion reaction: chills, fever, low back pain, flushing, tachycardia, tachypnea, hypotension, vascular collapse, hemoglobinuria, hemoglobineuria, bleeding, acute renal failure, shock, cardiac arrest, death.

Learner to: stop transfusion, hang a new bag of normal saline, treat shock as needed. Monitor vital signs, obtain blood sample for serological testing, obtain urine sample, and monitor I/O hourly. If patient continues to need blood, retype and crossmatch. Return the remainder of the blood product with the attached tubing to the blood bank.

Scenario Progression: It is now one hour later.

Frame 3	
VS: 99-84-16 BP: 124/70 Pulse Ox: 98%	
Sinus Rhythm: 84/min	
Auscultation Sounds:	
Left Lung: Clear	
Right Lung: Clear	
Heart: Normal Sinus Rhythm	
Bowel Sounds: Hypoactive	
Airway: Clear	
Monitor Controls	
SpO2: 98%	
Tperi: 99F	
Respiratory Rate: 16 /min	
Blood Pressure: 124/70	
Action by Participant	
Change Central Line Dressing	

Body System Assessment	Patient Finding
Neurological Sensory	Awake, alert, oriented X 4. Complains of fatigue when ambulating.
Cardiac	Regular rhythm. Normal heart sounds. Capillary refill 3 secs. +2 peripheral pulses.
Pulmonary	Bilateral chest expansion. Slight shortness of breath on ambulation. No chest pain. Breath sounds clear.
Musculoskeletal	Feels weak.
Gastrointestinal (GI)	Incision clean and dry. Abdomen flat/tender. Bowel sounds hypoactive in all quadrants.
Genitourinary (GU)	Clear yellow urine.
Pain/Wound	Color pale/cool. No numbness or tingling. Central line in right subclavian clean, no drainage.
Local Complaint	"I feel better now."
Lab/Diagnostic Results	

Facilitator Notes:
 Your patient is stable. It is now time to change the central line dressing.

Discuss the 3 ports to the central line. Take a separate 3-lumen catheter, fill each port with a different color of food coloring to demonstrate where each port exits the catheter. Discuss the infusate for each port: Distal Port-CVP monitoring, blood administration, High volume viscous fluids, and medications. Proximal Port-blood sampling, medications, blood administration. Medial Port-TPN, medications if not used for TPN.

Perform sterile dressing change. Observe for strict sterile procedure.

DEBRIEFING

Discuss acute transfusion reactions:

- a. Acute hemolytic
 - i. Cause
 1. Infusion of ABO incompatible blood
 2. Antibodies in the recipient's blood attach to antigens on transfused RBC's causing destruction
 - ii. Clinical Manifestations
 1. Chills, fever, low back pain, flushing, tachycardia tachypnea, hypotension, vascular collapse, hemoglobinuria, hemoglobinemia, bleeding, acute renal failure, shock, cardiac arrest, death
 - iii. Treatment
 1. Stop transfusion
 2. Hang new normal saline
 3. Monitor vital signs
 4. Obtain blood and urine samples
 5. Treat shock if necessary
 6. Monitor I/O hourly
- b. Febrile, nonhemolytic
 - i. Cause
 1. Sensitization to donor WBC, platelets or plasma proteins
 - ii. Clinical Manifestations
 1. Sudden chills/fever, headache, flushing, anxiety, muscle pain
 - iii. Treatment
 1. Stop transfusion
 2. Give antipyretic
 3. May administer leukocyte poor blood products in future
- c. Anaphylactic
 - i. Cause
 1. IgA antibody reaction
 - ii. Clinical Manifestation
 1. Anxiety, urticaria, wheezing, progressing to cyanosis, shock, possible cardiac arrest
 - iii. Treatment
 1. Stop transfusion
 2. CPR, if needed
 3. Epinephrine injection 0.4 ml of a 1:1000 solution subq or 0.1 ml of 1:1000 solution diluted to 10 ml with saline for IV use.
 4. Transfuse with washed RBC in future or use blood from IgA deficient donor.
- d. Circulatory Overload
 - i. Cause
 1. Fluid is more than the patient's cardiac/pulmonary status can accommodate.
 - ii. Clinical Manifestation

1. Cough, dyspnea, pulmonary congestion (crackles), headache, hypertension, tachycardia, distended neck veins
- iii. Treatment
 1. Sit patient up with legs dependent
 2. Administer oxygen, MSO₄, diuretics
 3. May perform phlebotomy
 4. Slow unit rate down
- e. Sepsis
 - i. Cause
 1. Contaminated blood products
 - ii. Clinical manifestation
 1. Rapid onset of chills, high fever, vomiting, diarrhea and marked hypotension and shock.
 - iii. Treatment
 1. Obtain cultures of patient and blood
 2. Treat septicemia with antibiotics, fluids, steroids, vasopressors

SAMPLE