ICU Scenario

SCENARIO: Susan Jones

SCENARIO LOCATION: ICU room

SCENARIO SYNOPSIS: Patient is a 43-year-old femle transferred to the medical ICU from rural emergency department (ED) with septic shock secondary to health care-acquired pneumonia (HCAP)

SCENARIO OBJECTIVES:

- Demonstrate sepsis huddle
- Recognize the need to evaluate volume status and tissue perfusion
- Demonstrate appropriate volume status and tissue perfusion evaluation and re-evaluation
- Discuss barriers to non-compliance with the sepsis bundles
- Discuss resuscitation of the end stage renal disease patient

PARTICIPANT ROLES:

- Senior Resident/Attending Physician
- Resident/Nurse Practitioner/Physician Assistant
- Primary RN
- Charge RN

FACILITATOR:

ASSISTIVE STAFF: Line tech (simulation staff)

Simulation scenario courtesy of Pat Posa RN, BSN, MSA, CCRN-K, FAAN, St. Joseph Mercy Hospital. Ann Arbor, Mich.

SETUP (for facilitator and simulation tech)

SCENARIO	Scenario Name	Susan Jones - ICU
	Prebrief Sheet	Yes
	Manikin/SP	Speaking manikin

ROOM	Room	ICU sim. room (direct admit)
	Room Set-Up	Inpatient
	Additional Equipment	Extra display for hemodynamic monitoring
		IV pump
		Ventilator tubing attached to O2 regulator

MANIKIN/SP	Manikin	Speaking manikin with charged batteries
	SP	N/A
	Dress	Pt. gown
	Moulage	Manikin intubated
		Wig
		Manikin on EMS stretcher in different room

IV	Number	Two
	Site/s	**Right arm**: antecubital **Left arm**: antecubital
	Fluid	**Right arm**: Levophed (norepinephrine) on pump tubing **Left arm**: saline lock
	Rate	Levophed at 20 mcg/min (clamped closed until placed on pump)
	Drain Bag	Yes
	Available	Two 1000 mL lactated Ringers, two 1000 mL normal saline in pressure bags w/pressure tubing and transducer – 1 attached to central line and 1 attached to a-line, additional pressure bags, line dressings

O2	Device	Endotracheal tube
	Flow	N/A
	Additional Devices	Use Ambu bag on patient while wheeling into room
		Vent tubing hooked on O2 regulator for 'vent' (Hook ET tube to this after patient in room)

PHONES	Number of Phones	4 - placed in briefing room, with copy of phone list (another copy of phone list in ICU sim. room)
	Who gets phones	Primary RN, Charge RN, Senior Resident/Attending Physician, Resident/NP/PA

OTHER	Room is empty (no patient) at start of scenario to allow participants to complete a sepsis huddle (discuss preparations)
	Manikin starts on EMS stretcher outside room, intubated, being bagged, delivered upon facilitator cue
	EMS gives report when dropping off patient, hooks manikin to monitor and vent, removes EMS stretcher upon leaving
	As participants call for items (central line, a-line) line tech goes into sim. room and 'places' items
	Central line gets attached to manikin's chest with a transparent securement dressing; tech activates CVP waveform when participants ask for it
	Arterial line is attached to manikin's wrist with self-adherent bandage; tech activates arterial line waveform after placement

PREBRIEF (if using manikin)

GENERAL	Pt. Name	Susan Jones
	Pt. Age	43
	Pt. DOB	10/08/19XX
	Pt. Weight	80 kg
	Pt. Chief Complaint	Cough, pain in lower extremities

HISTORY	Pt. PMHx	ESRD, IDDM, HTN, hyperlipidemia, CVA, GERD, depression
	Medications	Many
	Allergies	NKDA
	Surgical Hx	Many
	Social Hx	Lives in nursing home, ex-smoker, EtOH abuse, polysubstance abuse
	Family Hx	

SYSTEMS	Pt. Chief Complaint	Cough, pain in lower extremities
	Respiratory/pulmonary	Cough, shortness of breath
	Cardiovascular	Chest pain
	Abdominal	No complaints
	Genitourinary	No complaints (pt. does not produce urine)
	Musculoskeletal	No complaints

SPECIFICS	When did it start?	N/A
	Anything make it better/worse?	N/A
	Did you take any medications?	N/A
	Do you take all your medications as prescribed?	N/A
	Any other symptoms?	N/A

SYNOPSIS	Patient developed hypotension at dialysis and was unable to complete the course
	Went to rural ED and was transferred to acute care facility (direct admit)
	Pt. became obtunded on the way and was intubated by EMS

SCENARIO SUMMARY (for simulation tech)

Patient is a 43-year-old transferred to the medical ICU from rural ED with septic shock secondary to HCAP

PHASE 1	• Correct: 2,400 mL bolus **(PHASE 2)** • Incorrect: Increase Levophed **(PHASE 4)**	**Rhythm**: Sinus • BP: 72/40 • HR: 120 • SpO2: 95% • RR: 8 • T: 98.5°F
PHASE 2	• Correct: Administer fluid **(PHASE 3)** • Incorrect: No fluids within 2 minutes **(PHASE 5)**	**Rhythm**: Sinus • BP: 80/44 • HR: 116 • SpO2: 96% • RR: 8 • CVP: 4
PHASE 3	• Re-Assess patient • **END SCENARIO**	**Rhythm**: Sinus • BP: 96/40 • HR: 124 • SpO2: 95% • RR: 24 • CVP: 8
PHASE 4	• Correct: Administer fluid **(PHASE 3)** • Incorrect: No fluid **(PHASE 5)**	**Rhythm**: Sinus • BP: 78/42 • HR: 128 • SpO2: 95% • RR: 24 • CVP: 4
PHASE 5	• **END SCENARIO**	**Rhythm**: Sinus • BP: 68/38 • HR: 132 • SpO2: 95% • RR: 24 • CVP: 3

Lungs: Scattered Rhonchi
No JVD, or edema
Cap refill normal
Skin warm and dry

Hemodynamic Results

Set 1
SV 40
CI 2.5
CO 4.6
SVV 30
SVI 22

Set 2
SV 49
CI 3.0
CO 5.5
SVV 31
SVI 26

Set 3
SV 57
CI 3.1
CO 5.7
SVV 28
SVI 31

Repeat Lactic: 0.8
(Initial at rural: 1.2)

EMS REPORT

- Patient is a 43-year-old female with a history of CVA with right sided weakness, ESRD with HD on MWF, IDDM, HTN, HLD, PVOD and chronic pain
- The patient resides in a nursing home
- Patient was at dialysis today and became hypotensive; unable to complete treatment
- Upon arrival at rural ED at 1000, vital signs revealed tachycardia, SpO2 94% and BP 77/40
- The patient received no fluids but was started on a Levophed drip through a peripheral IV at 1100
- VS in ambulance
    - BP – 85/60
    - HR – 110
    - RR – 30
    - SpO2 – 80%
- Patient showed signs of respiratory distress with O2 sats in the 80's and RR in the 30's, decreased LOC
- Intubated in the ambulance
- Levophed at 20 mcq/min
- Patient received no IV fluids en route

INSTRUCTOR BRIEF

- Scenario starts with report being given to physician and RN separately. The patient will be arriving via EMS. Give the opportunity to do a sepsis huddle.
- Patient is a 43-year-old, 80 kg female patient with a history of CVA with right-sided weakness, ESRD with HD on MWF, IDDM, HTN, HLD, PVOD and chronic pain
- The patient resides in a nursing home
- Patient was at dialysis today and became hypotensive; unable to complete treatment
- Upon arrival at rural ED at 1000, vital signs revealed tachycardia, SpO2 94% and BP 77/40
- The patient received no fluids but was started on a Levophed drip through a peripheral IV at 1100
- CXR showed patchy consolidation of the right lung base, concerning for pneumonia
- Diagnosis is septic shock secondary to HCAP
- Patient is a transfer from rural ED
- Patient received no antibiotics or fluids in the rural ED
- Patient was intubated en route and is a direct ICU admit
- Time zero is 1100
- It is now 1230, patient is on Levophed at 20 mcg/min
- Vent settings: AC 8, TV 450, FiO2 60%, PEEP 5
- Patient is arriving in a few minutes
- Patient is fluid responsive; participants need to concentrate on the fluids first
- Participants need to assess fluid responsiveness twice

INSTRUCTOR BRIEF (cont'd.)

Additional information, if requested

Hemodynamic Results

- ScvO2 #1 – 65
- ScvO2 #2 – 72

Review of Systems:
General: no fever
Skin: no rash
Eyes: Grossly normal
Throat: Grossly normal
Respiratory: Shortness of breath, nonproductive cough
Cardiovascular: Chest pain
Gastrointestinal: Denies abdominal pain, patient denies frequent watery or odorous diarrhea
Genitourinary: Patient denies any dysuria, frequency or hematuria
Musculoskeletal: Patient denies any joint pain or swelling
CNS: Patient denies anxiety

Baseline Vital Signs:
B/P: 143/69 **HR:** 120 **RR:** 14 **T:** 36.0°C **SpO2**: 100%

Physical Examination:

General: alert and oriented, in minor distress
Weight, Height: 80 kg, 5'2"
CNS/Neuro: calm, no evidence of delusions
HEENT: wearing nasal cannula, diaphoretic
Neck: Grossly normal
Lungs: no wheeze, rhonchi noted bilaterally
Heart: sinus tachycardia, no murmur/gallop/heave
Abd: obese, +BS, soft, non-tender, ND
Back and Extremities: stage 2 ulcer on lateral sacral area, moving all 4 extremities
Wound: no rashes or lesions
Other: no joint effusion, no muscle tenderness, no LE edema, good DP pulses bilaterally

PARTICIPANT BRIEF: RN

- Patient is a 43-year-old female with a history of CVA with right sided weakness, ESRD with HD on MWF, DM, HTN, HLD, PVOD and chronic pain
- The patient resides in a nursing home
- Patient was at dialysis today and became hypotensive; unable to complete treatment
- Upon arrival at rural ED at 1000, vital signs revealed tachycardia, SpO2 94% and BP 77/40
- The patient received no fluids but was started on a Levophed drip through a peripheral IV at 1100
- CXR showed patchy consolidation of the right lung base concerning for pneumonia
- Diagnosis is septic shock secondary to HCAP
- Patient is a transfer from rural ED
- Patient was intubated en route and are a direct ICU admit
- Time zero is 1100
- It is now 1230, patient is on Levophed at 20 mcg/min
- Vent settings: AC 8, TV 450, FiO2 60%, PEEP 5
- Patient is arriving in a few minutes

PARTICIPANT BRIEF: RESIDENT/NP/PA

- Patient is a 43-year-old, 80 kg female patient with a history of CVA with right sided weakness, ESRD with HD on MWF, DM, HTN, HLD, PVOD and chronic pain
- Patient resides in a nursing home
- Patient was at dialysis today and became hypotensive; unable to complete treatment
- Upon arrival at rural ED at 1000, vital signs revealed tachycardia, SpO2 94% and BP 77/40
- Patient received no fluids but was started on a Levophed drip through a peripheral IV at 1100
- CXR showed patchy consolidation of the right lung base concerning for pneumonia
- Diagnosis is septic shock secondary to HCAP
- Patient is a transfer from rural ED
- Patient was intubated en route and are a direct ICU admit
- Time zero is 1100
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- Vent settings: AC 8, TV 450, FiO2, 60%, PEEP 5
- Patient is arriving in a few minutes

RURAL ED LABS AND DIAGNOSTICS

ABG		Reference Range
pH	7.39	7.35 – 7.45
CO2	32	35 – 45
PO2	84	80 – 100
HCO3	17	22 – 28
O2 Sat	93	> 75

Complete Blood Count with Differential		Reference Range	
		Male	Female
White Blood Cell (WBC)	14.9	4,500 – 10,000 K/uL	
Neutrophil Absolute	12.1	1.7 – 7.6 thou/mcL	
Hemoglobin (HBG)	9.4	13.5 – 16.5 g/dL	12.0 – 15.0 g/dL
Red blood cell (RBC)	2.96	4.5 – 5.5 M/uL	4.0 – 4.9 M/uL
Hematocrit	28.2	36.0 – 48.0%	
MCV	95	80 – 100 fL	
MCHC	33.5	32 – 36%	
Platelet	303	140 – 450 thou/mcL	

Basic Metabolic Panel		Reference Range
Sodium	134	135 – 147 mmol/L
Potassium	6.3	3.5 – 5.2 mmol/L
Chloride	93	95 – 107 mmol/L
CO2	28	22 – 30 mmol/L
BUN	45	7 – 20 mg/dL
Creatinine	6.37	0.5 – 1.2 mg/dL
Glucose	196	60 – 110 mg/dL
Calcium Total	9.9	8.5 – 10.1 mg dL
Lactate	1.2	0.5 – 2.2 mEq/L

Coags		Reference Range
Prothrombin Time	11.8	11 – 13.5 sec
INR	1.08	0.8 – 1.1

Radiology
Chest x-ray: Patchy consolidation of the RLL, concerning for PNA

REPEAT LABS DURING SCENARIO

Basic Metabolic Panel		Reference Range
Sodium	139	135-147 mmol/L
Potassium	4.7	3.5-5.2 mmol/L
Chloride	102	95-107 mmol/L
CO2	26	22-30 mmol/L
BUN	47	7-20 mg/dL
Creatinine	6.12	0.5-1.2 mg/dL
Glucose	159	60-110 mg/dL
Calcium Total	9.1	8.5-10.1 mg dL
Lactate	0.8	0.5-2.2 mEq/L

Complete Blood Count with Differentials		Reference Range	
		Male	Female
White Blood Cell (WBC)	12.0	4,500 – 10,000 K/uL	
Neutrophil Absolute	8.1	1.7-7.6 thou/mcL	
Hemoglobin (HBG)	8.4	13.5-16.5 g/dL	12.0-15.0 g/dL
Red blood cell (RBC)	2.68	4.5-5.5 M/uL	4.0-4.9 M/uL
Hematocrit	25.4	36.0-48.0 %	
Platelet	392	140-450 thou/mcL	

Coags		Reference Range
Prothrombin Time	27.7	11-13.5 sec
INR	1.12	0.8-1.1

PAPERWORK

DURING SCENARIO			
ITEM	**WHO HOLDS**	**WHEN GIVEN**	**TO WHOM**
Participant Brief-Resident/NP/PA	Instructor	At start of scenario	Residents
Rural ED Labs	Instructor	At start of scenario	Residents
Participant Brief-RN	Instructor	At start of scenario	Primary RN
EMS Report	Tech	When pt. is brought in	All participants
Repeat Labs	Tech	One minute after requested	All participants

PHONE LIST

CONTACT	PHONE NUMBER
Primary RN	
Charge RN	
Senior Resident/Attending Physician	
Resident/NP/PA	

OBSERVER CHECKLIST

CRITICAL PERFORMANCE STEPS	
Did the participants wash their hands?	Yes No
Did the participants demonstrate a sepsis huddle?	Yes No
Did the participants demonstrate closed-loop communication?	Yes No
Did the participants discuss barriers to non-compliance with the sepsis bundles?	Yes No
Did the participants demonstrate effective team communication?	Yes No
Did the participants evaluate volume status and tissue perfusion?	Yes No
Did the participants re-evaluate volume status and tissue perfusion?	Yes No

Hemodynamic Results – Set 1

SV	**40**
CI	**2.5**
CO	**4.6**
SVV	**30**
SVI	**22**

Hemodynamic Results – Set 2

SV	**49**
CI	**3.0**
CO	**5.5**
SVV	**31**
SVI	**26**

Hemodynamic Results – Set 3

SV	**57**
CI	**3.1**
CO	**5.7**
SVV	**28**
SVI	**31**