

Greenville County EMS

Sepsis Protocol Toolkit



June 2015

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1. Introduction:

Severe sepsis continues to be a leading cause of in-hospital mortality and often with significant time before identification in the Emergency Department (ED). EMS personnel are trained and expected to identify and treat life threatening conditions in a timely manner, but education on sepsis and its mortality have been overlooked by the EMS community in general. Early identification, early fluid resuscitation, and early administration of antibiotics are core measures that have been proven to significantly decrease mortality. These core measures are described as Early Goal Directed Therapy and are the framework for resuscitation of a severe sepsis patient.

Greenville County EMS (GCEMS) recognized the need for further education and believed that by this, sepsis morbidity and mortality would improve in the community. Through hospital system collaboration GCEMS identified that antibiotics (ABX) were administered in 101 minutes on average in-hospital, after transfer to the ED.

Through education of the field providers in identification of sepsis, developing a “Sepsis Alert” that was continued into the hospital, and administration of ABX in the field, we anticipated a decrease in timely treatment in the ED and thereby a decrease in overall mortality. This document is an outline of the development and implementation of this Sepsis Alert and application of Early Goal Directed Therapy for sepsis in the prehospital setting. This program would not have been successful without the dedicated and motivated employees of Greenville County EMS as well as the collaboration with both Bon Secours St. Francis Health System and the Greenville Health System.

2. Hospital Collaboration:

Screening and assessing sepsis patients in the pre hospital setting is one thing, having that care transitioned into the ED and ICU is another entirely. From the beginning of developing a sepsis treatment protocol, collaboration with your local receiving hospitals is paramount. The assessment tool, blood collection, and antibiotic treatment must be in line with current practice in hospital. All members of the various departments within the receiving hospitals should meet regularly with EMS to identify issues or improvement to the process and or procedure.

a: **Sepsis Coordinator**

Each facility should have one individual that coordinates and collects data related to sepsis patients in hospital. This should be the point of contact for feedback to EMS and direction on current sepsis protocols in hospital.

b: **Pharmacy**

Coordinate the appropriate antibiotic and dosing per in hospital protocol.

c: **Emergency Department**

As with most prehospital interventions, the ED is the vital link between the field to the rest of the hospital. All providers and personnel in the ED must be trained and briefed regularly of the sepsis alert protocol and antibiotic administration by EMS.

f: **Laboratory**

Procedures and processes must be in place for lab technicians to process and record prehospital blood collection. The laboratory should be responsible for collecting data on all cultures collected by EMS through an established Tech code used only by EMS. This information should be sent to EMS through the Sepsis Coordinator.

3. Training

Training objectives should be developed in a stepwise fashion beginning with sepsis identification, aseptic technique (blood culture collection), and ending with antibiotic administration. Each section shall build off the last. We recommend 4 hours of education on each topic (12 hours total) with 2 hours of didactic followed by 2 hours of hands on simulation training for each topic. This should be obtained through patient care scenarios, skills labs, and testing.

a: **Sepsis Identification**

There is little doubt that the sepsis education for most prehospital providers is limited to the understanding that septic shock is a distributive shock and is briefly covered in initial Paramedic education. The goal of sepsis identification training is to bridge this gap and give the providers the tools to diagnose sepsis in the field with their assessment only.

1. Description of systemic inflammatory response, SIRS criteria, and pathophysiology of this compensatory mechanism.
2. Sepsis overview to include definitions of sepsis, severe sepsis, and septic shock.
3. Primary sources of infection, ie: urinary, respiratory, gastro-intestinal, integumentary, etc.

b: **Aseptic Technique**

All paramedics have been taught aseptic technique, but due to the extreme sensitivity of contamination when collecting blood cultures all paramedics should be reeducated on proper technique as well as blood culture collection.

1. Importance of blood culture collection for suspected sepsis patients and prior to ABX administration.
2. Proper steps for blood collection based on developed procedure.
3. Importance of pretreatment lactate collection.

4. Proper steps for pretreatment lactate collection based on developed procedure.
5. Overview of aseptic technique, ChloroPrep, and equipment used.

c: Antibiotic administration

Education on ABX administration should focus on research supporting early ABX administration for suspected sepsis, types of ABX to be carried, and procedure for administration.

1. Importance of early antibiotics in suspected sepsis patients, ie: decreased mortality, decreased length of stay in hospital..
2. Outline specific antibiotics you will be carrying, type, action, contraindications.
3. Equipment and procedure for administration.

4. Sepsis Alert

Establishing a Sepsis alert should be the first priority prior to EMS blood collection or antibiotic administration. Criteria for the alert should be in line with current practice at the receiving facility and or the surviving sepsis campaign guidelines. We used a combination (see: EMS Evaluation and Treatment of Sepsis tool) of two or more SIRS criteria and a known or suspected source of infection. This would limit the diagnosis to sick patients and decrease the likelihood of over triage as we moved forward with ABX administration. This tool or criteria must be developed with the collaboration of all parties in the receiving facility. The alert should hold the same “weight” in the ED as a STEMI or Stroke alert currently being utilized by EMS. This requires significant “by-in” by ED providers.

a: Communication

An in-hospital process and system should be in place at the receiving hospital to activate a “sepsis alert” when they are notified by EMS. This can include notification of the sepsis coordinator, lab, and pharmacy. All alerts that are called

should be documented as such on the EMS PCR and reviewed for appropriateness based on the criteria.

b: Continuity of Care

When a sepsis alert is called, this should trigger the ED to continue the resuscitation bundle upon arrival of the patient in the ED. The triage and assessment for sepsis has already been completed by EMS based on their criteria. This act alone should significantly decrease the time to antibiotics in the ED. Blood must be taken from EMS in a timely manner and sent to the lab for processing. Any delay in processing the labs can further delay care and give inaccurate lab results (ie: lactate levels).

5. Sepsis Kits

Each laboratory will have requirements as to what equipment they can use to process blood cultures and lactate levels. This must be understood when collecting equipment for use in the field. A system should be in place to restock the used equipment in the ED or restocked by EMS. If multiple facilities are used with differences in equipment, then multiple kits may need to be utilized. (see: Sepsis Kit Contents)

a: Blood Cultures

Once the equipment has been established, the technique for collection should be developed in collaboration with the laboratory and ED of the receiving facility. Expect this process and procedure to evolve over time as you adjust for unique situations and limitations in your department.

b: Lactate

Prior to resuscitation, point of care lactate is an important measurement of severity of sepsis. It is preferred to collect blood for Lactate measurement prior to fluid administration. Due to the limited monitors on the market for use by EMS providers, we first utilized a heparinized syringe to collect a sample for processing

immediately upon arrival at the ED. It was found that there was a significant delay in time before the specimen was run in the ABG machine in the ED. Lactate in Heparin is only accurate for 20mins out of body. We have since changed our procedure and utilize a grey top blood tube. This sample is much more stable and is processed in the lab, not the ED ABG machine. The turnaround for results is slower but you get a far more accurate level.

c: EMS “Tech code”

A Tech code should be established for use by EMS only. This number or code should be written onto every blood specimen that is collect by EMS before it is turned over to the ED. When these specimens are sent to the lab it should be recorded as collected by the EMS tech code. This will allow for better data collection and identification of providers later. Each EMS provider does not need their own tech code. One for the entire department is all that is needed. Data analytics later should tell that department who the provider was that drew the culture.

6. Quality Assurance

A structured and thorough QA/QI process must be in place prior to field implementation. Through collaboration with the receiving hospital, a line of communication and patient follow up is imperative from the beginning. The focus of QA should include, appropriateness of treatment (sepsis alert), patient diagnosis in the ED, time to ABX, primary provider, blood culture contamination.

Appropriateness and patient diagnosis in the ED will give you a picture of your crews assessment ability and whether further education is needed to separate sepsis from non-sepsis.

7. Remediation

A structured and systematic procedure for remediation should be in place for providers that deviate or are showing poor performance in any area of the sepsis protocol. It will only take one or two providers in your service to “not care” about

blood culture collection to affect your data with excessive contaminations and skew the overall percentage. When any culture contamination has been identified, the provider that collected it should be given feedback to inform them of the contamination as well as request their feedback to see if it is an issue with the process. Most times this is sufficient to correct any issues but there can be times when excessive contaminations will require reeducation and/or remediation. This should include a brief over view of the procedure and demonstration of aseptic technique and blood culture collection.

8. Data Collection

A thorough and efficient system must be in place for accurate data collection of all patients in which the protocol is administered. GCEMS utilized the EMS Evaluation and Treatment of Sepsis Tool to track patients included in the protocol by the hospital and EMS. Once a patient was delivered to the ED a copy of the form was made. The original was left at the ED and a copy was given to the EMS training coordinator for data collection from the PCR. Furthermore, a medical category of SEPSIS – Sick Person was created in our ePCR systems that providers would use when they administered the protocol. All data could be collected directly from the PCR and placed in an excel spreadsheet. Once follow up was provided from the sepsis coordinator at the hospital this data was included on the patient line. All data points were included in a monthly QA meeting and reports were created to show monthly as well as up-to date contamination rates and total patients.

Green Sepsis patient sticker

Greenville County EMS
301 University Ridge Suite 1100 Greenville SC 29681

EMS Evaluation and treatment of Sepsis tool

Date: _____ EMS Arrival Time: _____ Truck Number: _____

Lead Medic: _____ Culture Drawn by: _____

Evaluation for Sepsis

1. Are any two of the following symptoms present AND new to the patient?

- Hyperthermia (> 101°F or 38°C) or hypothermia (< 96.8°F or 36°C)
- Heart rate > 90 beats per minute
- Respiratory rate > 20 breaths per minute or mechanical ventilation
- Signs of poor perfusion (such as SBP < 90 mm/hg)

2. Is the patient's presentation suggestive of any of the following infections?

- Pneumonia (cough/thick sputum)
- Abdominal pain and/or diarrhea
- Urinary tract infection
- Wound infection
- Acutely AMS change
- Skin/soft tissue infection
- Blood stream/Catheter related

If positive for sepsis, call a sepsis alert and follow the directions on the back

Temperature

Result: _____

Glucose

Result: _____ mg/dl
Normal Range 80-120 mg/dl

GCEMS – both sides of this sheet must be copied and turned in or emailed to Jason Walchok

Treatment for sepsis

Confirm no PCN allergy – If PCN allergy DO NOT ADMINISTER ANTIBIOTICS

Draw Blood Culture (8cc-10cc of blood in each vial)

Time drawn: _____

- Prepare a 2 inch site area with chloraprep and allow to dry
- Disinfect the top of each culture bottle with alcohol and allow to dry
- Inoculate the aerobic (blue cap) bottle first and then the anaerobic (purple cap) bottle.
- Minimum of 3cc of blood in aerobic bottle is required to proceed with antibiotic therapy
- If unable to draw cultures **DO NOT ADMINISTER ANTIBIOTICS**

Draw point of care lactate (only good for 30 min)

Time Drawn: _____

Begin fluid resuscitation: **Normal Saline 1,000cc**

Total given: _____

Presumed sepsis from pneumonia: **Rocephin 1 Gram IV**

Time hung: _____

Presumed sepsis **not** from pneumonia: **Zosyn (3.375) 4.5 Grams IV**

Time hung: _____

Sepsis

History:

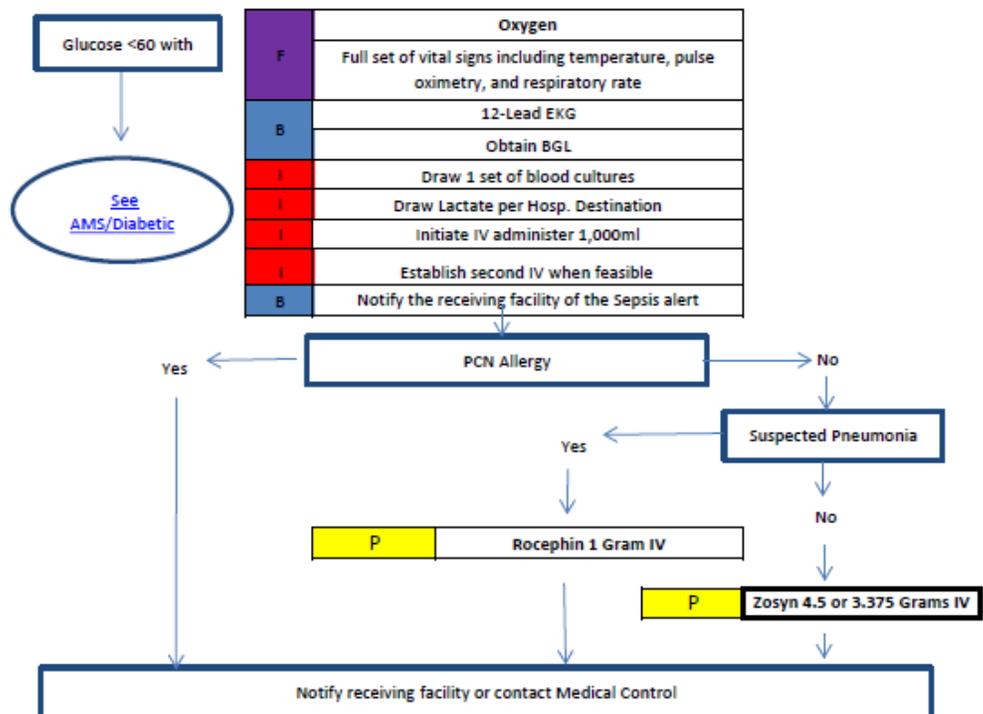
- Age > 18 Years
- Duration of fever
- Severity of fever
- Altered mental status
- Past medical history
- Medications
- Immunocompromised
 - Transplant
 - HIV
 - Diabetes
 - Cancer
- Environmental exposure
- Last Acetaminophen or

Significant Findings:

- Hyperthermia (>100.4°F/38°C)
- Hypothermia (<95°F/35°C)
- Tachypnea
- Tachycardia
- Acute mental status change
- Urinary tract infection
- Pneumonia
- Skin/soft tissue infection
- Abdominal infection
- Wound infection
- Suspected meningitis, endocarditis or osteomyelitis

Collecting Cultures:

- Maintain aseptic technique at all times
- Put on a new set of clean gloves
- Prepare site with Chloraprep
 - Clean 2 inch site
 - Allow site to dry
 - Do not touch once cleaned
- Remove cap from culture bottles
- Clean bottle diaphragm with alcohol
 - Allow to dry
- Venipuncture and draw blood
- Add 5-10ml of blood in each bottle
 - Aerobic (BLUE/GRAY) first
 - Anaerobic (PURPLE) second



PEARLS:

- If unable to obtain cultures, do not administer antibiotics
- Determine the hospital destination (SFHS or GHS) prior to drawing cultures. Use the appropriate kit.
- Utilize Sepsis Checklist
- **Septic shock** - Hypotension (SBP <90) refractory to fluid bolus, Consider Dopamine 5-20 mcg/kg/min
- Be alert for signs of anaphylaxis during antibiotic administration
- A second liter of Normal Saline can be administered for septic shock
- Extended scene times to provide antibiotic therapy are acceptable
- Withhold antibiotics if suspect meningitis, endocarditis, or osteomyelitis
- If possible meningitis, utilize precautions and notify ED of possible meningitis



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BLOOD CULTURE COLLECTION STEPS

1. Collect materials and equipment
 - a. Always draw blood for cultures first and blood tubes second
2. Put on a NEW/CLEAN set of gloves
3. Select venipuncture site
4. Prepare the venipuncture site with a Chloraprep applicator by vigorous scrubbing of the site for 30 to 60 seconds
 - a. If a patient is allergic to Chloraprep, scrub the venipuncture site with alcohol for 30 seconds and then tincture of iodine or betadine in concentric circles away from the site covering a 1-2 inch area and allow to dry
 - b. Allow the Chloraprep to completely dry on the venipuncture site (crucial step)**
 - c. Once disinfected, the collection site must not be touched again
 - d. Do not blot or wipe away. Do not fan, wave, or blow to speed drying. This is likely to re-contaminate the site
5. Inspect the blood culture bottles. Bottles must have no cracks, not be expired. Remove the protective flip top overcap and decontaminate bottle diaphragm top with 70% alcohol (bottle tops are not sterile). Allow the alcohol on the diaphragm to completely dry before adding patient's blood to the bottle.
6. Using a needle perform the venipuncture
7. Fill two (2) 10cc syringes with blood
8. Using the Vacutainer on the syringe, Inoculate the aerobic (blue/Gray cap) bottle first (between 8-10 cc of blood)
 - a. Minimum of 3cc is required to proceed with antibiotic therapy
 - b. Do not tilt culture bottles upward**
9. Inoculate the anaerobic (purple cap) bottle second (between 8-10 cc of blood).
10. Draw secondary labs if time permits.
11. Draw point of care lactate (Grey top blood tube)
12. Document Name and DOB on green sepsis wrist band
13. Apply the patient ID band to the patient's wrist and label the culture bottles with stickers
14. Record the time cultures drawn on sepsis checklist
15. If unable to draw cultures **DO NOT ADMINISTER ANTIBIOTIC**



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Sepsis Kit Content list

- 8 x 11 plastic ziplock to hold all contents

Inside:

- EMS Evaluation and treatment of sepsis tool
- IV start kit
- Extra Cloraprep
- 2 alcohol prep pads
- 2 (two) 10cc syringes
- Vacutainer
- Culture bottle set
- Grey top blood tube
- Wrist band w/ removable stickers
- Specimen bag



Simulation Center Overview

Goals

- Each employee, regardless of certification, will demonstrate competency in aseptic technique and blood culture draws on an IV arm utilizing a written checklist
- Each employee will demonstrate an appropriate sepsis assessment utilizing during a scenario and a written performance check-list
- Each employee will demonstrate competency in the basics of sepsis by completing a written 20 question exam and scoring greater than 80%

Participant flow

- Lecture in Classroom
- Group broken into 4 groups
 - Group 1a (debrief room 1) – aseptic technique
 - Group 1b (sim room 1) – sepsis recognition
 - Group 2a (debrief room 1) – aseptic technique
 - Group 2b (sim room 2) – aseptic technique
- After 30 minutes groups “a” and “b” switch
- After an hour each group should have completed 30 minutes of aseptic technique and 30 minutes of scenarios
- All 4 groups meet in the procedure room and begin a written exam
- Concurrently
 - One participant at a time will be checked-off in aseptic technique and sepsis recognition
 - Pull 1 group at a time (4 participants)

Aseptic Technique

- 5 minute introduction to aseptic technique
- 5 minute orientation to blood culture collection
- Practice (4 IV arms and supplies per room)
 - First time everyone walks through the steps together with the instructor leading
 - Each participant then must complete the entire procedure 5 times
 - No actual venipuncture

Scenario

- 5 minutes reviewing the signs of sepsis
- Instructor will demonstrate a complete assessment
 - Include skin temperature/moisture/turgor, lung sounds, glucose, abdominal assessment
- Run 5 scenarios with each person alternating and providing instructions
 - 2 scenarios will not be sepsis

Sepsis Scenarios

UTI with sepsis

Participant information

- Presented with a 22 year old female complaining of weakness and cold/flu like symptoms for the past several days. She's sitting in a recliner and is conscious and alert.
- Heart rate = 120, Resp rate 19, blood pressure 100/70

Only provided if/when asked by the participant

- Temperature – 101.4
- Glucose – 190 mg/dl
- Lungs clear
- EtCo2 – 24 normal waveform
- Symptoms; progressive weakness over the past week along with cold/flu type symptoms (fever, muscle aches).
 - No cough, no congestion, no sore throat
 - Painful/frequent urination
 - Left sided flank pain
- Allergies – none
- Medications – Ortho-Novum
- History – none

Treatment

- 1,000 litter of fluid
- 4.5g Zosyn

Cold/Flu

Participant information

- Presented with a 55 year old male complaining of weakness and cold/flu symptoms for the past several days. He's sitting in a recliner, covered in blankets, and looks miserable.
- Heart rate = 110, Resp rate 16, blood pressure 115/70

Only provided if/when asked by the participant

- Temperature – 102.5
- Glucose – 110 mg/dl
- Lungs clear
- EtCo2 – 40 normal waveform
- Symptoms; sudden onset of fever, muscle aches
 - Has a sore throat with post nasal drip
 - Productive cough with clear/white flem
- Allergies – none
- Medications – HCTZ
- Medical history – HTN

Treatment:

- Supportive care
- Uncover

Appendicitis with sepsis

Participant information

- Presented with a 34 year old female complaining of severe abdominal pain. She's found on the floor of the bathroom curled in a ball.
- Heart rate = 140, Resp rate 30, blood pressure 88/60

Only provided if/when asked by the participant

- Temperature – 99.6
- Glucose – 110 mg/dl
- Lungs clear
- EtCo2 – 30 normal waveform
- Symptoms: epigastric pain for the past hour that suddenly worsened and migrated to her RLQ. Shortly after developing abdominal pain she also became nauseous and began vomiting. She's in too much pain to answer many questions and she can't straighten her legs without causing increased pain.
 - No cough, no congestion, no sore throat
 - No recent painful/frequent urination
- Allergies – none
- Medications – none
- History – none

Treatment

- 1,000 litter of fluid
- 4.5g Zosyn
- Zofran

Pneumonia with sepsis

Participant information

- Presented with a 74 year old male supine in bed of a SNF who is lethargic.
- Heart rate = 160, Resp rate 40, blood pressure 112/60

Only provided if/when asked by the participant

- Temperature – 95.4
- Glucose – 114 mg/dl
- Lungs sounds rhonchi bi-laterally
- Has thick mucus dried on his face and shirt
- EtCo2 – 22 normal waveform
- Symptoms: RN states patient was slightly lethargic this morning (8 hours earlier) but he seemed to be improving. About an hour earlier he became hard to arouse and his O2 saturation dropped. His physician just called back and requested the patient be transported.
 - He is normal conscious and alert and can communicate well but is pleasantly confused
 - No other information is available – he's new to the facility for chemotherapy
- Allergies – PCN
- Medications – Lisinopril, Clopidogrel, synthroid, Glumetza
- History – Colon Cancer, HTN, CABG, NIDDM

Treatment

- Intubation
- 1,000 litter of fluid
- No antibiotics!

Food Poisoning – no sepsis

Participant information

- Presented with a 22 year old male complaining of severe abdominal pain. He's found on the floor of the bathroom curled in a ball.
- Heart rate = 140, Resp rate 16, blood pressure 100/70

Only provided if/when asked by the participant

- Temperature – 98.2
- Glucose – 110 mg/dl
- Lungs clear
- EtCo2 – 40 normal waveform
- Symptoms: Severe abdominal pain with nausea and vomiting. He's in too much pain to answer many questions
 - Began 2 hours ago after eating at potato salad (family picnic)
- Allergies – none
- Medications – none
- History – none

Treatment

- 1,000 litter of fluid
- Zofran



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Training Department

Name: _____ Service: _____ Date: _____ Cert: _____

Bold lettering denotes critical points and automatic failure

Venipuncture and Blood Culture Draws
Collect materials and equipment
New set of gloves Applied
Site Selected
Chloraprep used to clean site-vigorous scrubbing for 30 to 60 seconds
Chloraprep allowed to dry
IV site not touched again
Blood culture bottles inspected. Bottles must have no cracks, not be expired
Bottle diaphragm decontaminated with 70% alcohol
Venipuncture performed and vacutainer attached
Aerobic (blue/Gray cap) bottle inoculated first (verbalize minimum of 3 cc)
Anaerobic (purple cap) bottle inoculated second
Verbalize - withhold antibiotic use if unable to obtain cultures
Draw Blood for Lactate (Grey top)
Apply ID band to patient's wrist and label culture bottles
Record time of draw on sepsis checklist
Completed successfully
Facilitator Signature: _____



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Sepsis Recognition	
	Wears gloves
	Participant introduces themselves by name
	Correctly determines chief complaint
	Provides an appropriate assessment (SAMPLE)
	Checks for medication allergies - specifically PCN
	Obtains a temperature
	Obtains B/P, Heart rate, Resp Rate
	Obtains glucose
	Assess skin
	Assess lung sounds
	Provides a focused hands-on assessment including abdominal
	Correctly determines if patient is septic
	Verbalizes correct treatment
	Completed successfully _____
Facilitator Signature: _____	



Greenville County EMS

Sepsis Pretest

Name: _____ Date: _____

1. Severe sepsis is defined as?
 - a. An infection
 - b. An infection with organ system dysfunction
 - c. An infection with hypotension
 - d. Only UTI and pneumonia with hypotension
2. What is **not** automatically an EMS Treatment of severe sepsis:
 - a. 1 liter of Normal Saline
 - b. Antibiotic therapy
 - c. Dopamine
 - d. Blood culture draws
3. Which is a not a sign of a Systemic Inflammatory Response
 - a. Hyperthermia
 - b. Hypothermia
 - c. Heart rate >90
 - d. Altered mental status
4. What is the minimum amount of time the IV site should be scrubbed for?
 - a. 10 seconds
 - b. 20 seconds
 - c. 30 seconds
 - d. 90 seconds
5. After venipuncture what occurs next?
 - a. Green Tube collection
 - b. Syringe draw of 20 ccs of blood
 - c. Aerobic culture bottle (**blue/Gray cap**)
 - d. anaerobic (**purple cap**)
6. What is the most common cause of sepsis?
 - a. UTI
 - b. Abdominal infection
 - c. Blood stream infection
 - d. Pneumonia

7. Should a severe sepsis patient receive a liter of fluid if their blood pressure is 120/70?
 - a. Yes
 - b. No
8. A 36 year old female presents with a productive cough with clear phlegm, muscle aches/chills, and sore throat. She's febrile at 101 degrees, blood pressure 110/70, heart rate 110, resp rate 16, and GCS of 15. She has been sick for the past couple days that came on suddenly and her lungs are clear. Is this sepsis?
 - a. Yes
 - b. No
9. What must be done prior to inoculating the culture bottles?
 - a. Clean the top of the culture bottles with alcohol
 - b. Clean the top of the culture bottles with the used chloraprep
 - c. Nothing, the culture bottles are sterile if the cap is in place
 - d. Clean the top of the culture bottles with iodine
10. After scrubbing the IV site with chloraprep what should occur immediately after?
 - a. Allow to dry naturally
 - b. Wave/blow air over the site to speed drying
 - c. Venipuncture prior to drying to ensure a clean site
 - d. Apply iodine in symmetric circles over the site for an additional 30 seconds
11. All patients who have two or more signs of a systemic inflammatory response are automatically septic.
 - a. True
 - b. False
12. What is the main contraindication for administering antibiotics?
 - a. Hypotension
 - b. PCN allergy
 - c. Tachycardia
 - d. Sulfa allergy
13. All Sepsis patients will be febrile.
 - a. True
 - b. False
14. When drawing blood cultures what is essential?
 - a. To fill the bottles with a minimum of 10cc of blood
 - b. To draw the ABG first
 - c. To prevent the bottles from tilting upward
 - d. To prevent the bottles from tilting downward



Greenville County EMS

Sepsis Pretest - Answer key

1. B
2. C
3. B
4. C
5. C
6. D
7. A
8. B
9. A
10. A
11. B
12. B
13. B
14. C



Greenville County EMS

Sepsis Post Test

Name: _____ Date: _____

1. Severe sepsis is defined as?
 - a. An infection
 - b. An infection with organ system dysfunction
 - c. An infection with continued hypotension or a lactate >4
 - d. Only UTI and pneumonia with hypotension
2. Septic shock is defined as?
 - a. An infection
 - b. An infection with organ system dysfunction
 - c. An infection with continued hypotension or a lactate >4
 - d. Only UTI and pneumonia with hypotension
3. EMS Treatment of septic shock includes (O₂, IV, monitor does not count)
 - a. _____
 - b. _____
 - c. _____
4. List three signs of a Systemic Inflammatory Response
 - a. _____
 - b. _____
 - c. _____
5. All sepsis patients will be febrile.
 - a. True
 - b. False
6. A 55 year old female presents with a productive cough with green phlegm and general malaise. She's febrile at 101 degrees, blood pressure 100/70, heart rate 100, resp rate 20, lung sounds are "junky" and GCS of 15. She has been sick for the past several days that have gradually worsened with time. Is this sepsis?
 - a. Yes
 - b. No

7. What is the minimum amount of time the IV site should be scrubbed for?
 - a. 10 seconds
 - b. 20 seconds
 - c. 30 seconds
 - d. 90 seconds
8. An 18 year old female complains of right flank pain, frequent urination, and was running a fever (100.6) for the past two days. She is conscious and alert, in no apparent distress, heart rate 120, resp rate 16, and clear lung sounds. What is the best course of action?
 - a. O2, INT, transport
 - b. O2, cultures, and Zosyn
 - c. O2, cultures, Zosyn, and a litter of normal saline
 - d. BLS transport
9. After venipuncture what occurs next?
 - a. Green Tube collection
 - b. Syringe draw of 20 ccs of blood
 - c. Aerobic culture bottle (blue/Gray cap)
 - d. anaerobic (purple cap)
10. What is the most common cause of sepsis?
 - a. UTI
 - b. Abdominal infection
 - c. Blood stream infection
 - d. Pneumonia
11. Should a sepsis patient receive a litter of fluid if their blood pressure is 134/70?
 - a. Yes
 - b. No
12. A 36 year old female presents with a productive cough with clear phlegm, muscle aches/chills, and sore throat. She's febrile at 101 degrees, blood pressure 110/70, heart rate 110, resp rate 16, and GCS of 15. She has been sick for the past couple days that came on suddenly and her lungs are clear. Is this sepsis?
 - a. Yes
 - b. No
13. What must be done prior to inoculating the culture bottles?
 - a. Clean the top of the culture bottles with alcohol
 - b. Clean the top of the culture bottles with the used chloraprep
 - c. Nothing, the culture bottles are sterile if the cap is in place
 - d. Clean the top of the culture bottles with iodine
14. After scrubbing the IV site with chloraprep what should occur immediately after?
 - a. Allow to dry naturally
 - b. Wave/blow air over the site to speed drying
 - c. Venipuncture prior to drying to ensure a clean site
 - d. Apply iodine in symmetric circles over the site for an additional 30 seconds

15. All patients who have two or more signs of a systemic inflammatory response are automatically septic.
 - a. True
 - b. False
16. A 75 year old female at a nursing home presents lethargic (since 4 hours ago), heart rate 90, blood pressure 108/70, and a temp of 101.2 degrees and has a very strong odor of urine. What is the best course of action?
 - a. O2, INT, transport
 - b. O2, cultures, and Zosyn
 - c. O2, cultures, and Rocephin
 - d. O2, cultures, Zosyn, and a litter of normal saline
17. What is the main precaution when administering antibiotics?
 - a. Hypotension
 - b. Hypertension
 - c. Tachycardia
 - d. Anaphylaxis
18. When drawing blood cultures what is essential?
 - a. To fill the bottles with a minimum of 10cc of blood
 - b. To draw the ABG first
 - c. To prevent the bottles from tilting upward
 - d. To prevent the bottles from tilting downward
19. Upon completing the sepsis assessment and treatment tool
 - a. Copy front and back, submit copy to training, and give the original to the receiving RN
 - b. Copy front and back, submit copy to training, and discard the original
 - c. Sepsis checklist is not required
 - d. Provide to just the RN
20. How long is the drawn lactate good for (3cc of blood in ABG syringe)?
 - a. 30 minutes
 - b. 45 minutes
 - c. 60 minutes
 - d. 90 minutes



Greenville County EMS

Sepsis Post Test – Answer key

1. B
2. C
3. Blood Cultures
Antibiotics
Fluid bolus
4. Hyperthermia >101F, or Hypothermia <96.8F
Heart rate >90 beats per minute
Respirations >20 breaths per minute
5. B
6. A
7. C
8. C
9. C
10. D
11. A
12. B
13. A
14. A
15. B
16. D
17. D
18. C
19. A
20. A