

**Hunterdon Medical Center**  
is a 178-bed teaching hospital, in  
Flemington, NJ, that provides a full  
range of preventive,  
diagnostic/therapeutic inpatient,  
outpatient hospital and community  
health services.

# Our Sepsis Team Members

**Physician Leader:** Medical Director ICU

**Executive Leader:** Vice President Medical Affairs

**Facilitator:** Director Medical Staff Quality Improvement

## **Members**

Medical Director of Emergency Department

Physician – Medical Director Geriatric Medicine

Physician – Adult Hospitalist

Physician – Pulmonary/Critical Care

Medical Resident

Administrative Director of Medical/Surgical Nursing

Director of Emergency Department

Director Patient Safety/Patient Safety Officer

Clinical Coordinator Pharmacy

Director Infection Control Services

ICU Clinical Coordinator

IS Clinical Systems Coordinator

Staff Development Instructor

Coordinator Medical Staff Quality Improvement

Medical/Surgical RN

# Our Sepsis Team intends to accomplish the following by December 2015:

1. Develop a systematic process for identification of septic or potentially septic patients at the earliest possible time frame. Systems will be developed for both the Emergency Department and the Medical-Surgical nursing units.
2. Develop treatment protocols for timely effective and efficient treatment of sepsis while maintaining an exceptional mortality rate.

## Our Goals

1. Develop and implement a Sepsis Screening tool for:
  - Emergency Department
  - Early identification of potential septic patients by Med - Surgical nursing
2. Implement 3 hour bundle - measurement will be performed through retrospective chart review.
3. Decrease overall length of stay from 8.5 days to 7.5 days (*DRG patient population*) by 4<sup>th</sup> Quarter 2015.

# Baseline Data

*April thru May 2015*

*(random sample)*

## 3 Hour Bundle

**Population = 20 patients**  
**Average Age = 79 years**  
**Mortality = 10%**

**Lactic Acid Level Performed: 95%**

**Blood Cultures Performed: 100%**

**Broad Spectrum Antibiotics: 75%**

**30 mg/Kg Crystalloid when indicated: 40%**

# Medical Surgical Nursing Unit Sepsis Assessment: IN DEVELOPMENT

## PURPOSE:

To proactively screen all adult inpatients for signs and symptoms of emerging sepsis.

## PROCESS:

1. Using a pre-defined, medical staff approved criteria, nursing staff will assess every adult inpatient at the beginning of each shift and as indicated and evaluate the patient for signs and symptoms of potential sepsis by assessing:
  - SBP < 100 OR Diastolic BP < 50
  - Respiratory Rate > 25
  - Heart Rate > 100
  - Temperature < 36 (96.8) or > 38 (100.4)
2. If an assessment indicates a positive screen, the nurse will contact the attending physician or House Officer for STAT lab orders for:
  - CBC with Diff
  - Lactic Acid
    - If results of labs are: WBC is >12 or < 4 **OR** Bands >8 **OR** Lactic Acid > 18mg/dL, the attending or House Officer will consult the Intensivist on call for an urgent consultation.

# Emergency Department Sepsis Checklist



EMERGENCY DEPARTMENT  
SEPSIS CHECKLIST

Patient Label

Date: \_\_\_\_\_ Greet Time: \_\_\_\_\_ Time 2 SIRS met: \_\_\_\_\_ Pt Wgt/Kg: \_\_\_\_\_

### SEPSIS PRESENT ON ADMISSION RESUSCITATION BUNDLE CHECKLIST

Goal is to perform all indicated tasks 100% of the time within the first 6 hours of identification of sepsis/severe sepsis/septic shock (Greet time in ED).

#### 1<sup>st</sup> 3 HOURS - Emergency Department Section I

1 <sup>st</sup> 3 Hours	1. Measure serum lactate level: _____	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	> Intensivist called if lactate >2 mmol/L (lactic acid >18mg/dL)?	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	2. Obtain blood cultures before antibiotic administration	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	3. For Severe Sepsis and Septic Shock: ABX completed within 3 hours of greet time?	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	> 1 <sup>st</sup> Time IV ABX given: _____	
	SBP < 90mmHg	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	MAP < 65 mmHg	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	Lactate > 4 mmol/L (lactic acid > 36 mg/dL)	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	SBP decreased > 40mm Hg from baseline	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	4. Deliver an initial minimum bolus of 30ml/kg of NORMAL SALINE or LACTATED RINGERS within 3 hours of meeting one or more of above four criteria. _____ ml required    Total Fluids administered: _____ ml Time achieved: _____	<input type="checkbox"/> Yes <input type="checkbox"/> NO <input type="checkbox"/> N/A
Did MAP increase to >= 65 mmHg with initial fluid resuscitation?	<input type="checkbox"/> Yes <input type="checkbox"/> NO <input type="checkbox"/> N/A	
Central line placed?	<input type="checkbox"/> Yes <input type="checkbox"/> NO	
ED RNMD: _____		

#### 2<sup>nd</sup> 3 HOURS ICU Section II

\*In the event of persistent hypotension and continued clinical presentation of septic shock:

2 <sup>nd</sup> 3 Hours	5. Apply vasopressors for hypotension not responding to initial fluid resuscitation to maintain MAP>=65mmHg	<input type="checkbox"/> Yes <input type="checkbox"/> NO <input type="checkbox"/> N/A
	6. Repeat lactate if initial lactate > 2.0mmol/L (lactic acid >18mg/dL)	<input type="checkbox"/> Yes <input type="checkbox"/> NO
	7. Achieve a central venous pressure (CVP) of ≥ 8mmHg (for CL only) (if intubated >= 12)	<input type="checkbox"/> Yes <input type="checkbox"/> NO <input type="checkbox"/> Not Done Time Achieved: _____
	Achieve central venous oxygen saturation (Scv) ≥ 70% or mixed venous oxygen saturation (SvO2) ≥ 65%	<input type="checkbox"/> Yes <input type="checkbox"/> NO <input type="checkbox"/> Not Done Time Achieved: _____

Time left ED: \_\_\_\_\_ ED Dx: \_\_\_\_\_ Dispo/Rm #: \_\_\_\_\_

For ICU transfer, bed immediately available:  Yes  No

Name of person completing form: \_\_\_\_\_, RN / PharmD / MD / Other

\*\*NOT A PERMANENT PART OF THE MEDICAL RECORD\*\*

Return to Medical Staff Quality Improvement Department



EMERGENCY DEPARTMENT  
SEPSIS CHECKLIST

Patient Label

### 1. SIRS-Systemic Inflammatory Response Syndrome Definition (SIRS): Two or more of the following:

- Temperature greater than 38°C (100.4°F) or less than 36°C (96.8°F)
- Heart rate (HR) greater than 90 beats per minute (bpm)
- Respiratory rate (RR) greater than 20 breaths per minute or arterial carbon dioxide tension (PaCO2) lower than 32 mm Hg
- White blood cell (WBC) count higher than 12,000/pL or lower than 4000/pL, or 10% immature (band) forms H
- Alteration in mental status

### 2. Sepsis: SIRS with presence or suspicion of infection.

### 3. Severe Sepsis: Sepsis associated With new organ dysfunction evidenced by any one of the following:

- New or increased O2 requirement to maintain SaO2 >90%
- PaO2/FiO2 ratio < 300
- Creatinine > 2.0 mg/dl or 50% increase from baseline
- Urine output <0.5 ml/kg/hr for > 2 hrs
- Bilirubin >2.0 mg/dl
- Platelet count <100,000/mm3
- Coagulopathy (INR>1.5 and/or PTT> 60 sec)
- Lactate > 2 mmol/L (lactic acid >18 mg/dL)
- Systolic BP <90 mmHg or MAP < 65 mmHg
- Systolic BP decrease > 40 mmHg.
- New unexplained altered mental Status

### 4. Septic Shock: Sepsis complicated with state of acute circulatory failure characterized by persistent atrial hypotension despite adequate fluid resuscitation or by tissue hypoperfusion unexplained by other causes.

- Presence of severe sepsis as above AND
- If tissue hypoperfusion persists despite crystalloid fluid resuscitation as evidenced by SBP <90 or MAP <65 or SBP decrease > 40 points from known baseline
- Or Lactate > 4mmol/L (lactic acid >36 mg/dL)

\*\*NOT A PERMANENT PART OF THE MEDICAL RECORD\*\*

Return to Medical Staff Quality Improvement Department

# ICU Septic Shock Order Set

**Admit to Orders**

- Admit To ICU
- Transfer Patient
- Change Physician Service
- Level of Care (Levels 2 or 3)
- CVT Risk Assmt w/Orders

**Vital Signs**

- VS on admit then per unit protocol
- Vital Signs \_\_\_

**Activity**

- Bed rest
- Elevate Head of Bed
- Activity \_\_\_

**Nursing**

Neurochecks include Glasgow Coma Scale

- Neurological Check/VIS/Pulse Ox/Glasgow coma
- Weigh Patient every morning
- Bedside Cardiac monitoring
- Swan-Ganz Line Insertion
- IV Start/In Place, now
- Arterial Line Insertion
- Central Line Insertion
- Central Venous Pressure monitoring
- SCD \_\_\_
- I&O per unit protocol
- Pulse Oximetry q shift, Notify MD if O2 saturation is less than ...

Foley Cath Insertion

- Discontinue Foley Catheter
- Aspiration Precautions
- Fall risk precautions
- Nasogastric Tube Insertion
- 12-lead ECG today

**Diet**

- NPO
- Tube Feeding
- Diet \_\_\_
- TPN per order form

**IV FLUID ORDERS**

Bolus / Continuous IV's:

- NaCl 0.9% bolus x1
- NaCl 0.9% @ \_\_\_ mL/hr, Start if NS 0.9% bolus order complete
- NaCl 0.45% bolus x1
- NaCl 0.45% @ \_\_\_ mL/hr, Start if NS 0.45% bolus order comp...
- D5W bolus x1
- D5W @ \_\_\_ mL/hr, Start if D5W bolus order complete
- LR bolus x1
- LR @ \_\_\_ mL/hr, Start if LR bolus order complete

**IV Titrations:**

- NaCl 0.9% titrate to CVP parameters
- NaCl 0.45% titrate to CVP parameters
- D5W titrate to CVP parameters
- D5 w/ NaCl 0.9% titrate to CVP parameters
- D5 w/ NaCl 0.45% titrate to CVP parameters
- LR titrate to CVP parameters

**Common IV Orders**

**MEDICATION ORDERS**

**Vasopressor-Inotropes:**

- Vasopressors and Inotropic Agents

**Corticosteroids:**

- hydrocortisone (soluCORTEF) 100 mg IV every 8 hours
- hydrocortisone (soluCORTEF) \_\_\_ mg IV every \_\_\_ hours

**Pathogen-Directed Therapy - MRSA**

- vancomycin \_\_\_ mg IV every \_\_\_ hours (Dosing Guideline: 15 mg/...
- linezolid (ZYVOX) 600 mg in 300 mL D5W IV every 12 hours

**Beta-Lactams (Select One):**

**Penicillins:**

**Renal Dosing Guidelines:**

- CrCl 20 to 40 mL/min: 2.25 grams IV q8h (3.375 grams IV q8h fo...
- CrCl less than 20 mL/min: 2.25 grams IV q8h (2.25 grams IV q8h f...
- piperacillin/tazobactam (ZOSYN) 3.375 grams IV every 6 hours

**Anticoagulants:**

- vancomycin (VANCOBIN) 250 mg via tube every 6 hours
- vancomycin (VANCOBIN) \_\_\_ mg via tube every \_\_\_ hours
- Common Meds (ICU/CCU)

**Diabetes Agents:**

ICU Insulin Protocol: Refer to paper order form

**Proton Pump Inhibitors:**

via Tube / Oral

- pantoprazole (PROTONIX) 40 mg via tube once daily
- pantoprazole (PROTONIX) 40 mg via tube every 12 hours
- pantoprazole (PROTONIX) 40 mg PO once daily
- pantoprazole (PROTONIX) 40 mg PO every 12 hours

**IV**

- pantoprazole (PROTONIX) 40 mg IV once daily
- pantoprazole (PROTONIX) 40 mg IV every 12 hours

**H2 Antagonists:**

Renal Dose Adjustment: CrCl less than 50 mL/min use Once Daily ...

via Tube / Oral

- famotidine (PEPCID) 20 mg via tube every 12 hours
- famotidine (PEPCID) 20 mg via tube once daily
- famotidine (PEPCID) 20 mg PO every 12 hours
- famotidine (PEPCID) 20 mg PO once daily

**IV**

- famotidine (PEPCID) 20 mg IV every 12 ho...
- famotidine (PEPCID) 20 mg IV once daily

**Radiology**

- Portable CXR AP Upright today
- CXR PA & Lat today
- Abdomen DX today
- Abdomen and Pelvis CT scan w/contrast to...
- Abdomen and Pelvis CT w/out contrast toda...
- Chest CT with IV contrast today
- Chest X Ray
- Abdomen DX
- Abdomen and Pelvis CT
- Chest CT
- Common Radiology Orders

**Respiratory Therapy**

- Oxygen Therapy Setup
- Invasive ventilation
- Non-Invasive ventilation
- Respiratory Therapy Common Orders

**Laboratory**

**STAT Labs:**

- Magnesium
- Phosphorus
- CMP (Comprehensive Metabolic Panel)
- Cortisol Random

**Cephalosporins:**

- ceftRIAXone (ROCEPHIN) 1 gram IV once daily
- ceftRIAXone (ROCEPHIN) 1 gram IV every \_\_\_ hours
- ceftRIAXone (ROCEPHIN) 2 grams IV once daily
- ceftRIAXone (ROCEPHIN) 2 grams IV every \_\_\_ hours
- ceftRIAXone (ROCEPHIN)

**Ceftazidime Renal Dosing Guidelines:**

- CrCl 31 to 50 mL/min: 1 gram q12h
- CrCl 16 to 30 mL/min: 1 gram once daily
- CrCl 6 to 15 mL/min: 500 mg once daily
- CrCl less than 5 mL/min: 500 mg q48h

- ceftazidime 2 grams IV every 8 hours
- ceftazidime \_\_\_ grams IV every \_\_\_ hours

Cefepime renal dose adjustment depends upon total daily dose, C...

- cefepime (MAXIPIME) 1 gram IV every 8 hours
- cefepime (MAXIPIME) 2 grams IV every 8 hours
- cefepime (MAXIPIME)

Imipenem renal dose adjustment depends upon total daily dose, C...

**Carbapenems:**

- Imipenem (PRIMAXIN) \_\_\_ mg IV every \_\_\_ hours

**Macrolide:**

**IV**

- azithromycin (ZITHROMAX) 500 mg IV once daily
- azithromycin (ZITHROMAX) \_\_\_ mg IV every \_\_\_ hours

**Aminoglycosides:**

- gentamicin \_\_\_ mg IV every \_\_\_ hours (Dosing Guideline: 1.7 mg/...
- gentamicin \_\_\_ mg IV every 24 hours (Dosing Guideline: 5 to 7 m...
- tobramycin \_\_\_ mg IV every \_\_\_ hours (Dosing Guideline: 1.7 mg/...
- tobramycin \_\_\_ mg IV every 24 hours (Dosing Guideline: 5 to 7 m...

amikacin (AMKIN) \_\_\_ mg IV every \_\_\_ hours (Dosing Guideline: ...

amikacin (AMKIN) \_\_\_ mg IV every 24 hours (Dosing Guideline: 1...

**Quinolones:**

- moxifloxacin (AVELOX) 400 mg IV once daily
- ciprofloxacin 400 mg IV every 12 hours
- ciprofloxacin 200 mg IV every \_\_\_ hours (Renal Dose Adjustment ...

**Pathogen-Directed Therapy - Clostridium difficile**

**IV**

- metronIDAZOLE (FLAGYL) 500 mg IV every 8 hours
- metronIDAZOLE (FLAGYL) \_\_\_ mg via tube every 8 hours
- metronIDAZOLE (FLAGYL) 500 mg PO every 8 hours

via Tube / Oral

**B Type Natriure**

- Hemoglobin A1C
- Lipid Profile
- Procalcitonin
- Troponin
- Lactic Acid
- CBC with Differential
- CK
- Urinalysis
- Urine Microscopic
- C Reactive Protein
- ESR (Erythrocyte Sedimentation Rate)
- ANA
- Rheumatoid Arthritis Factor
- ANCA Panel (Anti-neutrophil Cytoplasmic...)

**Serial Labs:**

- Troponin now then q3h x2
- Lactic acid now & q 12h X2
- CK now & q8h X3

**Tomorrow AM Labs:**

- Magnesium
- Phosphorus
- Comprehensive Metabolic Panel
- Cortisol
- B Type Natriuretic peptide
- Hemoglobin A1C

**Lipid Panel**

- Troponin
- Troponin Level
- Lactic Acid
- CBC with Differential
- Creatine Kinase
- D-Dimer
- FDP (Fibrin Split Products)
- Fibrinogen
- PTT (Partial Prothrombin Time)
- PT/INR (Prothrombin Time)
- ABG (RT/IN to draw - PAGE RT)
- Central Venous Blood Gas

**Blood Gases:**

**REMINDER: Page RESP Beeper 036 for STAT Orders**

- Central Venous Blood Gas now & q 8 hr (order only if central l...
- Central Venous Blood Gas now & q\_1hr (order only if central li...
- ABG (RT/IN to draw - PAGE RT)

**Coagulation Studies**

- Coagulation panel for ICU
- PT/INR (Prothrombin Time)

**Microbiology/Immunassays**

- Blood Culture
- Urine Culture
- Sputum Culture (Respiratory Culture and Gram Stain)
- Stool Culture (Stool, Enteric Pathogens)

**Clostridium Difficile Toxin Gene Dete...**

- Legionella Antigen, Urine Random
- Strep Pneumo Antigen Urine

**Therapeutic Drug Levels**

- Amikacin Peak
- Amikacin Trough
- Gentamicin Peak
- Gentamicin Trough
- Common Laboratory Orders

**Other Testing**

**Cardiovascular Testing**

- Transthoracic echocardiogram today

**Consults/Referrals**

- Cardiology Consult
- Critical Care Consult
- Dietary Consult
- Endocrinology Consult
- Surgical Consult
- Infectious Disease Consult
- Nephrology Consult
- Pulmonary Consult
- Consult \_\_\_