Education Packet for Medical Staff: Sepsis, AHD, Time Outs, Restraints and Seclusions

Topics Include:
- AHD
- Time Outs
- Restraints and Seclusions
- Sepsis
ADVANCED HEALTH DIRECTIVE (AHD) MANAGEMENT
AHD Management
Advanced Health Directives

- DNV requires the hospital to have a process to allow the patient to formulate an AHD immediately upon entering the healthcare system.
- New York State law requires that notice is given to a patient about how to formulate an AHD. We give this to our in- and out-patients in a registration packet.
- Must document if patient has AHD in medical record:
  - ED documents in the initial RN assessment note
  - Inpatients are asked by the admitting RN within 8 hours of admission
- DNV requires a policy for follow up if AHD is not in the record (Nursing Responsibility)
- Each Nursing Unit monitors AHD status and paperwork daily with an electronic report (pulls AHD status from nursing assessment) and RN closes the loop on missing paperwork.
- Nursing will request the Medical Provider complete a new MOLST if unable to obtain existing one from home or other facility after 24 hours of admission.
Code Status Documentation

- Code status order required in SJLinked/Epic at the time of order entry.
- Three code status choices to comply with NYS MOLST:
  1. Full Code
  2. DNR
  3. DNR/DNI
- Further details are available from MOLST or scanned MOLST (SJLinked/Epic).
- MOLST form (paper copy) must be completed for DNR and DNR/DNI.

Key Message Points:

1. **DNR**: when a patient has no pulse and/or is not breathing, no cardiopulmonary resuscitation will be performed.
2. **DNI**: when a patient has a pulse and is breathing, no intubation will be performed for respiratory distress.
3. Patients should not be DNI without DNR.
THE TIME OUT
BEDSIDE PROCEDURES

New York State Required
Surgical and Invasive Procedure Protocol
Why review Time Out?

Recall.... The Institute of Medicine, *To Err is Human*

Code 911 -- Wrong Patient, Wrong Site surgical procedure

Code 912 -- Incorrect Procedure or Treatment – invasive

Code 901 -- Serious occurrence
All Bedside procedures must have a time out

All Bedside procedures must have:
- Consent
- Marking of site if laterality present
- Time out procedure

This includes all invasive procedures performed in the hospital, inpatient and outpatient. Not just the surgical arena.
Communication is a MUST!
Immediate before starting a procedure:

- Identify the patient
- Identify the site and side
- Announce the procedure to be performed
- Proper patient position
- Availability of implants, if apply
- Verification of wristband and chart
- Radiological images present, when germane to case.
List of Possible Procedures requiring timeout
(non-inclusive)...

- Abscess drainage
- Arterial line placement
- Bone marrow aspiration, Bone marrow biopsy
- Central venous line (single- or multilumen) placement or replacement and removal
- Cardiac pacing, initiation of, using external wires
- Chest exploration
- Chest tube placement and removal
- Circumcision
- Closed reduction of a fracture
- Dialysis catheter placement, replacement and removal
- Epidural catheter placement
- External ventricular device placement
- Externalization of tunneled ventriculoperitoneal (VP) shunt
- Halo placement
- Incision and drainage
- Insertion of pins for traction
- Intraosseous line placement
- Intubation
- Intraaortic balloon pump placement and removal
- Intracranial line placement, replacement and removal
- Laceration repair
- Lumbar (CSF) drain placement
- Lumbar drain removal
- Lumbar puncture
- Nerve block
- Paracentesis
- Pericardiocentesis
- PICC line placement
- PICC line removal
- Resection of skin tags
- Resection of extra digits
- Setting of a fracture
- Shrapnel removal (shallow)
- Steinmann pin placement
- Suprapubic cystocentesis (bladder tap)
- Swan-Ganz catheter placement or replacement
- Thoracentesis
- Transvenous pacemaker placement
- Transvenous pacemaker removal
- Triple lumen catheter removal
- Umbilical catheter placement
- Umbilical catheter removal
- Wound debridement
- Wound vac dressing change
- Wound vac placement
- Ventriculostomy placement
- Ventriculostomy removal
Should I or Shouldn’t I?

If you question the need to perform a time out?

Then you should perform a time out.

All *invasive* procedures anywhere in the hospital setting require a time out at the start of the procedure.

Don’t forget to document completion of your Time Out!
Recall ....

not all procedures need a time out

Emergencies
- Intubation in a code
- Unstable pts prior to surgery ie… Code C cesarean section, MVA

- Foley catheter
- IV
- Blood draws
Required Policy and Procedure

All organizations must have a policy and procedure that incorporates the contents of NYSSIPP, and ensures that the requirements for patient identification, site marking, pre-operative/pre-procedural verification, and “time out” are consistently followed whenever invasive procedures are performed, including, but not limited to procedures performed in the operating room, radiology, obstetrics/labor and delivery, emergency departments, cardiac catheterizations lab, clinical units, and outpatient areas. The institutional policy and procedure must specify the actions to be taken when a discrepancy occurs at any step in the process.
PHYSICIAN RESPONSIBILITIES IN THE USE OF RESTRAINTS AND SECLUSION
The clinical team at St. Joseph’s Hospital is committed to:

- A safe environment for patients
- Using restraints as a last resort when least restrictive interventions have failed.
What is our definition of restraints?

- Any manual method, physical or mechanical device, materials or equipment that immobilizes or reduces the ability of a patient to move his/her arms, legs, body or head freely.
Physician Responsibilities for the Use of Restraints and Seclusion

a. Evaluate the patient’s physical and mental status.

b. Write an order for each episode of the use of restraints or seclusion.

c. Renew orders as follows:
   • Non-violent patients = each calendar day
   • Violent patients = every 8 hours for restraints and every 6 hours for seclusion.

d. Evaluate with the nurse any patient who has been on restraints or seclusion for > 72 hours.

e. Complete a face to face evaluation of all patients on restraints or seclusion for violent behavior within one hour of the initiation of the intervention. This evaluation includes both a physical and behavioral assessment of the patient and should be documented using the One Hour Face-to-Face Evaluation Form (Click here for Draft).
One Hour Face-to-Face Evaluation (Violent Restraints including Seclusion) DRAFT

NOTE: THE ONE HOUR FACE-TO-FACE EVALUATION MUST BE COMPLETED BY A PHYSICIAN IN CPEP, ED AND 3-6. FOR ALL OTHER UNITS IT CAN BE COMPLETED BY A PHYSICIAN OR CLINICAL AFFILIATE

Service Area: __________________ Date/Time Restraint/Seclusion Ordered: __________________

Reason for Restraint/Seclusion: ______________________________________________________

Date/Time Face-to-Face Evaluation completed: ________________________________________

Review of systems:

☐ No change from last assessment
☐ Change from last assessment

Gen: ______________________
HEENT: ____________________
CV: _______________________
Resp: _____________________
Abd: ______________________
Psychiatric: ________________

Test Results:

☐ No change from last assessment
☐ Changes

Vital Signs:
T ___________ BP ___________ HR ___________ RR ___________

Drugs and Medications:
☐ No change from last assessment
☐ Changes

What factors are contributing to patient’s violent or self-destructive behavior? (Check all that apply)

☐ Drug or medication interactions
☐ Electrolyte imbalance
☐ Hypoxia
☐ Sepsis
☐ Other: ____________________________

Plan:

☐ Discontinue restraints
☐ Continue restraints

NP/PA/MD Signature (SEE NOTE ABOVE) __________________________ Date/Time

If NP or PA, spoke with Dr. __________________________ on __________________________

Date ___________ Time ___________

MR REVISION DATE: MM/DD/YYYY Side 1 of X
Chemical Restraints

A chemical restraint is a medication that is used for short term (1-2 doses) restriction of the patient’s behavior or freedom of movement when there is a danger to physical safety of the patient and others.

Chemical restraints should be documented using the One Hour Face-to-Face Evaluation Form.
Training for implementation of NYS DOH early recognition and treatment law “Rory’s Regulations”
Presentation Overview

- Mortality from sepsis continues to be high at SJHHC and nationally.
- The purpose of this presentation is to provide current concepts and workflows for the early recognition and treatment of Sepsis and Severe Sepsis.
- This presentation will cover:
  - Critical definitions and the “Sepsis Continuum”.
  - Importance of lactate.
  - NYS DOH sepsis law: “Rory’s Regulations”.
  - Current treatment guidelines.
  - Integration of SJLinked/Epic.
Facts

- 750,000 patients develop sepsis each year in U.S.
- #1 cause non-coronary deaths; sepsis kills more people than HIV/AIDS, prostate cancer, breast cancer combined.
- SJH in-hospital sepsis mortality rate 25% in 2013. (National 14.7-29.9%).
- Incidence of sepsis increasing:
  - increased invasive procedures, immune modulators, elderly and high-risk individuals (DM, Cancer, HIV).
- $17 billion annually, 40% total ICU expenditures.
Critical Definitions

- **SIRS (Systemic Inflammatory Response Syndrome):** systemic response to disease characterized by ≥ 2 clinical signs (SIRS markers).
  - Temp > 100.9 °F or < 96.8 °F.
  - Respiratory Rate > 24 rpm or PaCO2 < 32 mmHg.
  - Heart Rate > 90 bpm.
  - WBC > 12 K/µL or < 4 K/µL or > 10% Bands.

- **SIRS can be infectious or noninfectious.**
  - Noninfectious causes include pancreatitis, surgery, trauma, burns, etc.
  - Always consider an infectious etiology even in the setting of obvious noninfectious causes.
Critical Definitions (cont.)

- Sepsis: SIRS* and documented or suspected infection.
- Severe Sepsis: Sepsis plus Sepsis-induced tissue hypoperfusion or organ dysfunction (any of the following):
  - Sepsis-induced hypotension (SBP < 90 mmHg, MAP < 65 mmHg, or SBP decrease > 40 mmHg from baseline).
  - Lactate > 2 mmol/L.
  - Urine output < 0.5 mL/kg/hr for > 2 hr despite adequate fluid replacement.
  - Acute lung injury (decreasing oxygenation).
  - Creatinine > 2.0 mg/dL.
  - Bilirubin > 2 mg/dL.
  - Platelet count < 100 K/µL.
  - Coagulopathy (INR > 1.5 not on anticoagulant).
- Septic Shock: Sepsis-induced hypotension unresponsive to fluids.

*See appendix A for “Surviving Sepsis Campaign” complete list of systemic manifestations that define Sepsis.

Adapted from Table 2. Surviving Sepsis Campaign. Crit Care Med 41:580-637, 2013
Relationship: Infection, SIRS, Sepsis, Severe Sepsis and Septic Shock.

Systemic Inflammatory Response Syndrome (SIRS): systemic response ≥ 2 SIRS markers.
- Temp > 100.9 °F or < 96.8 °F.
- Respiratory Rate > 24 rpm or PaCO2 < 32 mmHg.
- Heart Rate > 90 bpm.
- WBC > 12 K/µL or < 4 K/µL or > 10% Bands.

SIRS and documented or suspected infection.

Sepsis plus sepsis-induced tissue hypoperfusion or organ dysfunction:
- Cardiovascular
- Renal
- Respiratory
- Hepatic
- Hematologic
- CNS
- Acidosis
- Lactate > 2 mmol/L

Sepsis-induced hypotension unresponsive to fluids.
Lactate = Lactic Acid:
Risk Stratify and Monitor Treatment Response.

- Lactate levels correlate with tissue perfusion.
- Obtain lactate for all patients with possible Sepsis.
- Risk stratify:
  - Identifies tissue hypoperfusion in normotensive patients at risk for septic shock.
  - Lactate > 2 mmol/L: indicates severe sepsis.
  - Lactate ≥ 4 mmol/L: mortality 30%.
  - Hypotension and lactate ≥ 4 mmol/L: mortality 46.1%.
- Monitor response to treatment:
  - Lactate normalizes with successful treatment.
Mechanisms for Elevated Lactate in Sepsis.

- **Mitochondrial failure:**
  - Inhibitory cytokines and endotoxin
  - Anaerobic metabolism

- **Microvascular stasis:**
  - Vasodilation
  - Microthrombotic occlusion
  - Endothelial dysfunction

- **Catecholamine stimulation:**
  - Energy demands exceed O2 supply

- **Regional hypoxia**
  - Poor tissue oxygen extraction

- **Microcirculatory shunting**

Adapted from: http://www.derangedphysiology.com/php/Metabolic-acidosis/Lactic-acidosis/lactic-acidosis-due-to-sepsis.php
Sepsis Survival: Dependent on Early Diagnosis and Treatment!

For every 1 hour delay in antibiotics after hypotension, mortality increases 7.6%!

Standardized Protocols to Diagnose and Treat Sepsis Decrease Mortality

- Kaiser Permanente Northern California ↓ 40%.
- Regions Hospital in Minnesota ↓ 60%.
- Intermountain Health Care ↓ 64%. ($38 million per year cost savings)
- South Nassau Communities Hospital ↓ 44%.
- Stony Brook University Medical Center ↓ 49%. ($0.75 million per year cost savings)
“Rory’s Regulations”

- Because of the magnitude of problem and potential for saving lives, NYS DOH instituted a set of regulations known as “Rory’s Regulations” after a 12 year old boy who died of sepsis in April 2012:
  1. Screen all patients for early recognition of sepsis.
  2. Establish timeframes for the administration of antibiotics and protocol implementation.
  3. Provide patients and family decision-makers with critical information about care.
Fighting Sepsis at SJHHC.

SJLinked
One integrated patient chart…
Overview Early Recognition and Treatment of Sepsis and Severe Sepsis at SJHHC

- Continued clinical monitoring for signs of infection before SIRS and Sepsis develop.
- SIRS Best Practice Advisory (BPA) to assist in early detection.
- Guidelines to evaluate patients with SIRS to identify and risk stratify Sepsis and Severe Sepsis.
- Order Sets that incorporate “Surviving Sepsis Campaign” recommendations.
- “Sepsis Call” response team to quickly initiate treatment for Severe Sepsis.
- Complete integration with SJLinked/Epic May 1st, 2014.
Continued Clinical Monitoring and Astuteness Paramount

- Infection presents in many guises.
- Clinical alertness to the possibility of an infection is critical.
  - For example, new erythema, purpura, pain, AMS should suggest possible infection.
- Early detection and treatment of infection before SIRS and Sepsis are present is our primary goal.

SIRS Best Practice Advisory (BPA): Method to Detect Sepsis Early

- Designed to assist in the early detection of Sepsis.
- Alert Based on identifying presence of SIRS (≥ 2 SIRS markers):
  - Temp > 100.9 °F or < 96.8 °F.
  - Respiratory Rate > 24 rpm or PaCO2 < 32 mmHg.
  - Heart Rate > 90 bpm.
  - WBC > 12 K/µL or < 4 K/µL or > 10% Bands.
- Look back 24 hr abnormal labs and 12 hr vitals.
- Will display to Nurse and Provider when in patient chart.
- When acted upon will be reset for 72 hr.
- BPA will be adult and pediatric specific.
SJLinked SIRS BPA: Components

1. Definitions
2. Patient SIRS Markers and critical labs.
3. Response to BPA with links to actions
SIRS BPA: Data from 1-5 Pilot

*Temperature was an infrequent trigger for SIRS BPA despite Sepsis.

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**Occurrence of Two SIRS Markers (n=36)**

- Temp and HR
- Temp WBC
- HR and WBC

**Sepsis Alert Etiology (n=31)**

- Known Infection: 55%
- New Infection: 10%
- No Infection: 35%
SIRS BPA Integration: Early Recognition and Treatment Workflow

- SIRS BPA will fire to nurse and provider when in chart.
- BPA will fire to the nurse when entering vital signs that fulfill SIRS criteria.
- The BPA indicates that the patient has SIRS and is at risk for Sepsis and Severe Sepsis.
- The nurse will inform the provider that the patient has SIRS.
- If the provider does not respond to the nurse’s call, a “Rapid Response” will be initiated.
In response to the BPA, the provider will address 4 items:

1. Is the etiology of SIRS infectious or noninfectious?
2. If infectious, is Severe Sepsis present with available data such as hypotension or decreased urine output?
3. Order labs to determine etiology of Sepsis and if Severe Sepsis is present. Lactate is critical to risk stratify all patients. Other labs will be dependent on what has been done.
4. Results of labs ordered (#3) need to be checked and acted upon as indicated.

Note: time is critical and labs should be ordered as quickly as possible, often when discussing patient with nurse before evaluation of the patient.
Early Detection and Treatment of Sepsis and Severe Sepsis Workflow.

SIRS† Alert Fires to Nurse and Provider

Nurse and Provider discuss patient as indicated.§.

Provider determines:
1. Etiology of SIRS?
2. Is Severe Sepsis present with available data?
3. What labs are needed†?
4. Results of labs ordered (#3).

SEVERE SEPSIS*: Sepsis-induced tissue hypoperfusion or organ dysfunction.

Initiate “Sepsis Call” & “Severe Sepsis Order Set”

Goals:
- IV Fluids < 30min
- Antibiotics < 1hr
- 3 hr and 6 hr Sepsis bundles
- Continued evaluation

Order labs not done (lactate, “Sepsis Order Set”) to determine:
- Is Severe Sepsis present?
- Etiology of Sepsis?

Infectious SIRS (SEPSIS‡): Documented or Suspected Infection.

Order labs not done (lactate, “Sepsis Order Set”) to determine:
- Is Severe Sepsis present?
- Etiology of Sepsis?

Noninfectious SIRS: Trauma, Surgery, Etc. Treat as indicated and continue to monitor for infection.

Order labs not done (lactate, “Sepsis Order Set”) to determine:
- Is Severe Sepsis present?
- Etiology of Sepsis?

Severe Sepsis• NOT present. Initiate treatment and continued evaluation for SEPSIS‡.

†SIRS: ≥ 2 SIRS markers.
- Temp > 100.9 °F or < 96.8 °F.
- Respiratory Rate > 24 bpm or PaCO2 <32 mmHg.
- Heart Rate > 90 bpm.
- WBC > 12 K/µL or < 4 K/µL or > 10% Bands.

‡Sepsis:
SIRS and documented or suspected infection.

*Severe Sepsis:
Sepsis-induced tissue hypoperfusion or organ dysfunction.
- Sepsis-induced hypotension.
- Lactate > 2 mmol/L.
- Urine output < 0.5 mL/kg/hr for > 2 hr.
- Creatinine > 2.0 mg/dL.
- Bilirubin > 2 mg/dL.
- Platelet count < 100 K/µL.
- Coagulopathy (INR > 1.5 not on anticoagulant).

NOTE:
- §Rapid response if nurse cannot contact provider in 20 min.
- †Labs (especially lactate) will usually be ordered after discussion with nurse.
Differentiating Infectious and Noninfectious SIRS

- Requires clinical judgment.
- Directly evaluate patients with SIRS.
- If suspected infection, treat as Sepsis.
- With unclear etiology of SIRS, consider Sepsis and evaluate for infectious etiology with labs, including lactate.
- Consider the possibility that both noninfectious and infectious etiologies of SIRS may be present!
- Follow patients with noninfectious SIRS for occult infection.
To assist provider in Sepsis evaluation, an SJLinked “Sepsis Report” will consolidate infection-related data:

**SIRS (Systemic Inflammatory Response Syndrome):** Systemic response to disease including infection characterized by the presence of greater than or equal to 2 SIRS markers. A positive sepsis alert indicates SIRS is present with greater than or equal to 2 of the following SIRS markers. This systemic response could be due to an infection or other disease. The patient must be evaluated for sepsis and severe sepsis. Temperature > 100.9 degrees F (38.3 degrees C) or 96.8 degrees F (36 degrees C) Heart Rate>90 bpm Respiration >24 bpm or PaCO2 <32mmHg WBC >12K/microliter or <4K/microliter or >10% bands

Sepsis: Systemic manifestations (including SIRS) and documented or suspected infection.

Severe Sepsis: Sepsis plus sepsis-induced tissue hypoperfusion or organ dysfunction.
“Sepsis Call” response team formed to speed treatment of Severe Sepsis*

- Activated by provider when Severe Sepsis diagnosed.
- Multidisciplinary team:
  - Pharmacist.
  - Phlebotomy / IV Therapy.
- Goal: administration fluids within 30 min. and antibiotics within one hour of the diagnosis of severe sepsis.

*Note: will start May 1, 2014 with SJLinked/Epic.
Sepsis and Severe Sepsis/Septic Shock
Order Sets for evaluation and treatment available in SJLinked

- **Sepsis Evaluation Order Set:**
  - Common labs and studies used in a sepsis/infection workup.
  - 2 sets BC, CBC and manual dif, CMP, PT/PTT, UA C&S, CXR.

- **Severe Sepsis Order Set:**
  - Similar to current paper orders.
  - Incorporates surviving sepsis 3 and 6 hr bundles.
TO BE COMPLETED WITHIN 3 HOURS:
1. Measure lactate level.
2. Obtain blood cultures prior to administration of antibiotics.
3. Administer broad spectrum antibiotics.
4. Administer 30 mL/kg crystalloid for hypotension or lactate 4 mmol/L (decreased to lactate > 2 mmol/L at SJH).

TO BE COMPLETED WITHIN 6 HOURS:
5. Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥ 65 mm Hg.
6. In the event of persistent arterial hypotension despite volume resuscitation (septic shock) or initial lactate 4 mmol/L (36 mg/dL):
   • Measure central venous pressure (CVP)*.
   • Measure central venous oxygen saturation (ScvO2)*.
7. Remeasure lactate if initial lactate was elevated*.

*Targets for quantitative resuscitation included in the guidelines are CVP of ≥8 mm Hg, ScvO2 of 70%, and normalization of lactate.
SJLinked Severe Sepsis/Septic Shock Order Set.

**Systemic Inflammatory Response Syndrome (SIRS) Criteria** (*AT LEAST TWO MUST APPLY*)
- Temperature <= 96.8 F or > 100.9 F
- HR > 90
- Respirations > 24 or PaCO2 < 32 mmHg
- WBC > 12k, < 4k or > 10% bands

**Mandatory Criteria** (*BOTH MUST APPLY*)
- Clinical Suspicion of Infection
- SBP < 90 mmHg OR lactate > 2 mmol/L OR evidence of at least one organ dysfunction

*Do not sign this orderset unless BOTH mandatory criteria and at least TWO of the SIRS criteria apply.*

**General**
- Notify Physician
  - Notify Physician for Abnormal Vital Sign Parameters
    - Until discontinued, CVP < 12mmHg MAP < 65mmHg HCT < 25% or a change of > or = 5%
  - Notify Physician (Specify Other Reasons)
    - Until discontinued

**Floor Specific Orders**

**Critical Care Specific Orders**

**Labs**
- Sepsis Panculture
  - Once, if not done within the past 6 hours.
- Lactate Level
  - Once, if not done within the past 6 hours.
- CBC with Differential
  - Once, if not done within the past 6 hours.
- Comprehensive Metabolic Panel
  - Once, if not done within the past 6 hours.
- Type and Screen
  - STAT, if not done within the past 6 hours.
- ABC
  - STAT, if not done within the past 6 hours.

**Imaging**
- **Chest**
**Continued Evaluation and Treatment:**

Patients with Infection, SIRS, Sepsis, or Severe Sepsis require:

- Continued monitoring for development of Sepsis or Severe Sepsis.
- Continued evaluation for site of infection if unclear.
- Source control (e.g. drain abscess) <12 hr after diagnosis.
- Reassess specificity of antibiotics daily.
- Follow up culture results.
- Empiric broad spectrum antibiotics ≤ 3-5 days.
FIGHTING SEPSIS AT ST. JOSEPH’S HOSPITAL

Early Detection and Treatment of Sepsis and Severe Sepsis Workflow.
Early Detection and Treatment of Sepsis and Severe Sepsis Workflow.

**SIRS† Alert Fires to Nurse and Provider**

Nurse and Provider discuss patient as indicated.§

Provider determines:
1. Etiology of SIRS?
2. Is Severe Sepsis present with available data?
3. What labs are needed‡?
4. Results of labs ordered (#3).

**SEVERE SEPSIS*: Sepsis-induced tissue hypoperfusion or organ dysfunction.**

Order labs not done (lactate, “Sepsis Order Set”) to determine:
- Is Severe Sepsis present?
- Etiology of Sepsis?

**Infectious SIRS (SEPSIS†): Documented or Suspected Infection.**

Order labs not done (lactate, “Sepsis Order Set”) to determine:
- Is Severe Sepsis present?
- Etiology of Sepsis?

**Noninfectious SIRS:**
- Trauma
- Surgery
- Etc.
  Treat as indicated and continue to monitor for infection.

**Initiate “Sepsis Call” & “Severe Sepsis Order Set”**

Goals:
- IV Fluids < 30min
- Antibiotics < 1hr
- 3 hr and 6 hr Sepsis bundles
- Continued evaluation

**Severe Sepsis• NOT present. Initiate treatment and continued evaluation for SEPSIS*.**

**SIRS: ≥ 2 SIRS markers.**
- Temp > 100.9 °F or < 96.8 °F.
- Respiratory Rate > 24 bpm or PaCO2 <32 mmHg.
- Heart Rate > 90 bpm.
- WBC > 12 K/µL or < 4 K/µL or > 10% Bands.

*Sepsis:
- SIRS and documented or suspected infection.

Sepsis-induced tissue hypoperfusion or organ dysfunction.
- Sepsis-induced hypotension.
- Lactate > 2 mmol/L.
- Urine output < 0.5 mL/kg/hr for > 2 hr.
- Creatinine > 2.0 mg/dL.
- Bilirubin > 2 mg/dL.
- Platelet count < 100 K/µL.
- Coagulopathy (INR > 1.5 not on anticoagulant).

†SIRS: ≥ 2 SIRS markers.
‡Labs (especially lactate) will usually be ordered after discussion with nurse.
§Rapid response if nurse cannot contact provider in 20 min.
Summary Overall Goals

1. Continual vigilance for signs of infection.
2. Identify Sepsis early with help of SIRS BPA.
3. Determine etiology and risk stratify by evaluating patient and ordering labs including lactate.
4. If severe sepsis, activate “Sepsis Call” team and initiate Severe Sepsis order set.
5. Obtain blood cultures before starting antibiotics.
6. Administer antibiotics within one hour of diagnosis of Severe Sepsis.
7. Decrease Sepsis mortality.
Conclusions

- Sepsis is a critical illness accounting for a high percentage of in-hospital mortality.
- Early diagnosis and treatment is critical.
- Increased clinical awareness, the SIRS BPA and protocolized responses will help to identify and treat infections, Sepsis, and Severe Sepsis early and reduce in-hospital mortality.
- The SIRS alert and timed treatment goals are new for SJH and feedback is appreciated to improve the system.
Appendix:

- Appendix A: “Surviving Sepsis Campaign” Definition of Sepsis.
- Appendix B: Adult Severe Sepsis Order Set
- Appendix C: Pediatric Sepsis
Appendix A: “Surviving Sepsis Campaign” Definition of Sepsis

Sepsis: Documented or suspected infection and some of the following:

**General variables**
- Fever (> 100.9 F) or Hypothermia (core temperature <96.8 F)*
- Heart rate > 90 bpm*
- Tachypnea*
- Altered mental status
- Significant edema or positive fluid balance (> 20mL/kg over 24hr)
- Hyperglycemia (plasma glucose > 140mg/dL) in the absence of diabetes

**Inflammatory variables**
- Leukocytosis, Leukopenia, or Bandemia (WBC count > 12K/µL, <4K/µL > 10% bands)*
- Plasma C-reactive protein > 2SD above normal
- Plasma procalcitonin > 2SD above normal

**Hemodynamic variables**
- Arterial hypotension (SBP<90mm Hg; MAP<70mmHg or SBP decrease >40 mm Hg)

**Organ dysfunction variable**
- Arterial hypoxemia (Pao2/FiO2 <300)
- Acute oliguria (urine output < 0.5 mL/kg/hr >2hr despite adequate fluid replacement)
- Creatinine increase > 0.5mg/dL
- Coagulation abnormalities (INR>1.5 or aPTT>60s)
- Ileus (absent bowel sounds)
- Thrombocytopenia (platelet count < 100K/µL)
- Hyperbilirubinemia (plasma total bilirubin > 4mg/dL)
- Hyperlactatemia (> 1mmol/L)
- Decrease capillary refill or mottling

* SIRS ≥ 2 SIRS Markers
SIRS fulfills criteria for Sepsis

Adapted from Table 1. Surviving Sepsis Campaign. Crit Care Med 41:580-637, 2013
Appendix B: Adult Severe Sepsis Order Set

<table>
<thead>
<tr>
<th>Severe Sepsis / Septic Shock Management Order</th>
<th>For Patients 18 years old and older</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial IV Fluid Bolus</strong> - through at least a 20 gauge catheter or central line</td>
<td><strong>Normal Saline 0.9% IV 2 L bolus or calculate 30 mL/kg</strong></td>
</tr>
<tr>
<td><em>For hypotension or Lactate greater than 2 mmol/L</em></td>
<td>Monitor BP response</td>
</tr>
<tr>
<td><strong>Insert central venous line (multi-lumen) for persistent hypotension (MAP less than 65 mmHg OR Lactate &gt; 4 mmol/L)</strong></td>
<td><strong>Normal Saline 0.9% IV at 50 mL/h</strong></td>
</tr>
<tr>
<td><strong>Repeat IV Bolus</strong> if Mean Arterial Pressure &lt; 65 (SBP &lt; 90 mmHg if MAP unavailable) give 0.9% NS 500 mL bolus over 30 minutes. Repeat x 2.</td>
<td><strong>Target CVP 8 mmHg for non vented patient or 12 mmHg for ventilated patient</strong></td>
</tr>
<tr>
<td><strong>Insert central venous line (multi-lumen)</strong> for persistent hypotension (MAP less than 65 mmHg OR Lactate &gt; 4 mmol/L of fluid resuscitation administered. Complete Invasive Line Procedure Form #16175.**</td>
<td></td>
</tr>
</tbody>
</table>

**Lab/Diagnostic Tests**

| STAT Blood cultures x 2 sets (prior to antibiotics if possible), UA with micro, Urine Culture, Sputum C&S, Urine for Legionella and Strep antigens |
| Obtain following studies STAT if not done in last 6 hours. |
| Lactate level. If Lactate level > 2 mmol/L, obtain Lactate level q4h until < 2 mmol/L, CBC with Mernal Differential, CMP, Type and Screen, ABG, PCXR - indication: severe sepsis, EKG - indication: severe sepsis, Source of infection clearly known: disease-specific order set completed for antibiotic coverage (i.e. pneumonia order set completed). |

**Antibiotic Therapy**

| Utilize High-Priority Medication Process: All 1” dosing are to be STAT and given within 1 hour of ordering. |
| - Piperacillin-tazobactam 3.375g iv q8h + Vancomycin 1 gm iv q4h then per Pharmacy + Ciprofloxacin 400mg q8h + Meropenem 500mg q3h then per Pharmacy. |
| - Source of infection clearly known: disease-specific order set completed for antibiotic coverage (i.e. pneumonia order set completed). |

**Alternate Antibiotic Therapy needed:** STAT phone call to pharmacy or Infections Disease Specialist must be made. |

**Empiric Therapy for C difficile:** C difcile 250 mg po/NG qd + metronidazole 500mg iv q8h. |

**Respiratory**

| Oxygen Therapy maintain O2 sat > 92% |
| If patient admitted to ICU = Mechanical Ventilation per protocol. Ventilator Weaning Protocol. |

**Physician Signature**

| Date/Time |

**RN Signature**

| Date/Time |
Appendix C: Pediatric Sepsis

- **Definition**: Pediatric patient: birth to less than or equal to 17 years old
- Nursing assesses patient and if patient has (2) SIRS, obtains immediate provider assessment.
  - Temperature
  - Greater than 100.4 °F from birth to less than or equal to 3 months old
  - Greater than 101.3 °F for greater than 3 months and less than or equal to 17 years old
  - **OR**
  - Less than 96.8 °F orally or rectally for all ages
- Heart Rate
- Respiratory Rate

<table>
<thead>
<tr>
<th>AGE</th>
<th>Heart rate</th>
<th>Respiratory Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 months</td>
<td>&lt;80 or &gt;190</td>
<td>&gt;50</td>
</tr>
<tr>
<td>4 months -23 months</td>
<td>&gt;170</td>
<td>&gt;40</td>
</tr>
<tr>
<td>2-10 years</td>
<td>&gt;140</td>
<td>&gt;20</td>
</tr>
<tr>
<td>11-17</td>
<td>&gt;100</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>
Pediatric patient continued...

- Provider uses Pediatric Sepsis Recognition Tool to risk stratify sepsis by:
  - Assessing low risk patient and managing disease process
  - Assessing high risk patient and determining if signs and symptoms of severe sepsis/shock are present
- Provider uses algorithm on the back of the Sepsis Tool for severe sepsis/shock and initiates Pediatric Severe Sepsis Orders
  - Goal is to provide time managed standardized protocol within (1) hour
Pediatric Sepsis Recognition Tool

SIRS: if two or more of the following are present (suspected sepsis)

- Temperature:
  - Greater than 100.4 °F for birth to less than or equal to 3 months old
  - Greater than 101.3 °F for greater than 3 months and less than or equal to 17 years old
  - Less than 96.8 °F orally or rectally for all ages.
- Abnormal WBC or greater than 10% immature neutrophils
- Tachypnea
- Tachycardia

Abnormal heart and respiratory rates

<table>
<thead>
<tr>
<th>AGE</th>
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</tr>
<tr>
<td>11-18</td>
<td>&gt;100</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>

Pediatric Severe Sepsis Algorithm

0 min
- Recognize decreased mental status and perfusion
  - Irritability
  - Inappropriate crying
  - Drowsiness
  - Confusion, lethargy
  - Prolonged capillary refill > 3 sec (cold shock)
  - Diminished pulses (cold shock)
  - Mottled cool extremities (cold shock)
  - Flash capillary refill (warm shock)
  - Bounding peripheral pulses and wide pulse pressure (warm shock)
- Rapid MD Evaluation
- Risk stratify
- Antipyretics

5 min
- Initial resuscitation: Push boluses of 20 ml/kg isotonic saline or colloid up to and over 60ml/kg until perfusion improves (rales may be heard if pneumonia is suspected cause of sepsis, so may not always imply the child is fluid overloaded.)
  - Signs of overload
    - Rales
    - Gallop rhythm
    - Hepatomegaly
- Correct hypoglycemia and hypocalemia
- Begin first dose of antibiotics
- Consider starting 2nd IV for inotrope
- Complete in 5-10 minutes

15 min
- Fluid refractory shock: Begin inotrope IV/IO
  - Obtain central access and airway if needed.
  - Reverse cold shock by titrating dopamine drip.
  - If resistant titate epinephrine.
  - Reverse warm shock by titrating norepinephrine
- Complete by 45 minutes

60 min
- Catecholamine resistant shock: Obtain order for Hydrocortisone if at risk for absolute adrenal insufficiency
- Complete by 60 minutes
**Physician’s Order Form: Pediatric Severe Sepsis Orders For Patients Less Than or Equal to 17 years Old**

**USE BALL POINT PEN. PHYSICIAN’S SIGNATURE REQUIRED FOR EACH ORDER **BLACK INK ONLY**

**DRUG ALLERGIES / ADVERSE DRUG REACTIONS (INCLUDE REACTION IF KNOWN)**
Refer to the Allergy Documentation Sheet located in Order Section for allergy details.

**UNACCEPTABLE ABBREVIATIONS:** ARAºA, AZT, HCT, HCTZ, Mg SO4, MSO4 / MS, MTX, Norflo, TAC, ZnSO4, CPZ, IU, QD, QOD, U x3d, x4d,µg, etc.

***For complete list please reference medical record***

**Physician & Nurse MUST** sign each set of orders & record date & time

**NON-DRUG ORDERS**

<table>
<thead>
<tr>
<th>Time and Date:</th>
<th>RN Signature:</th>
</tr>
</thead>
</table>

| 1. Place patient on cardio-respiratory monitor/ oximeter |
| 2. Check BP, HR, RR and capillary refill every 5 minutes until stable |
| 3. Draw ABG |
| **Oxygen Therapy** |
| Administer O2 to keep SpO2 between 94-99% via________________ |

**Obtain the following LABS STAT**

| 1. Blood culture x 2 prior to antibiotics |
| 2. Urinalysis, culture and sensitivity-straight catheterization |
| 3. CBC with manual differential |
| 4. CMP |
| 5. PT, PTT, INR |
| 6. D-Dimer |
| 7. Lactic acid |

**Other:**

| □ Lumbar puncture |
| □ Portable chest x-ray: evaluate for pulmonary infiltrates |

**Optional labs:**

| □ Random cortisol |
| □ Amylase |
| □ Lipase |
| □ Type and screen |
| □ Sputum gram stain / culture and sensitivity |

**Each Drug order should contain: Drug Name, Dose, Route, Frequency & PRN indication.**

<table>
<thead>
<tr>
<th>DRUG ORDERS &amp; IV ORDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ No known allergies to antibiotics.</td>
</tr>
<tr>
<td>Administer 0.9% NS 20ml /kg=_______ IV over 15-20 min.</td>
</tr>
<tr>
<td>□ Repeat NS bolus x 2 (up to 60ml/kg/hour)</td>
</tr>
</tbody>
</table>

**Cefotaxime** (Max dose: 2000mg )
IV over 3-5 minutes (all ages)
Dose= 75mg/kg x wt ______kg = __________mg/Dose x1

**Neonate (0-28 days) add:**

| □ Ampicillin IV over 3-5 minutes (max rate =100mg/minute) |
| Dose= 50mg/kg/x wt _____kg =__________mg/Dose x1 |

**Cephalosporin Allergy/Penicillin allergy (anaphylaxis):**

| Aztreonam (Max dose: 2000mg) IV over 10 minutes (all ages) |
| Dose= 30 mg/kg x wt _____kg= __________mg/Dose x1 |

**For Neonates (0 - 28 days):**

| Clindamycin IV over 30 minutes |
| Dose= 5mg/kg x wt___kg= _______ mg/Dose x1 |

**For Children > 28 days:**

| Clindamycin (Max dose: 600mg) |
| IV over 30 minutes |
| Dose= 10 mg/kg x wt___kg= _______ mg/Dose x1 |

**For Evidence /Suspicion of Staphylococcus species add:**

| □ Vancomycin; (Max dose 1000mg) |
| IV infuse over 60 minutes (all ages) |
| Dose 15 mg/kg x wt _____kg =_______mg /Dose x1 |

| □ Dopamine 800mg/500ml premix (Dosing:2.5-15 mcg/kg/min) |
| Initial dose: __ mcg/kg/min x ___kg=____mcg/min IV/IO continuous infusion. Titrate per provider order. |

| □ Norepinephrine 4mg/100 ml D5W (Dosing:0.1 – 2 mcg/kg/min) |
| Initial dose: __mcg/kg/min x ____kg=____mcg/min IV/IO continuous infusion. Titrate per provider order. |

| □ Epinephrine 2mg/100 ml D5W (Dosing: 0.1 – 1 mcg/kg/min) |
| Initial dose: __mcg/kg/min x ____kg=____mcg/min IV/IO continuous infusion. Titrate per provider order. |

| □ Hydrocortisone (Max dose:100mg) |
| 1-2 mg/kg/dose IV bolus over 30 seconds. May give undiluted. |
| Dose/kg_______ x wt_______kg=_________mg /Dose IV x1 |

---

*Contact Prescriber for Further Antibiotic Orders if Patient is still at SJHHCC greater than 4 hours*
Let’s Test your knowledge...
What is SIRS?
a. Systemic Inflammatory Response Syndrome
b. Can be due to infectious or non-infectious causes
c. Characterized by two or more abnormal clinical signs in four categories including temperature, heart rate, respiratory rate, and WBC
d. All of the above
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b. Can be due to infectious or non-infectious causes
c. Characterized by two or more abnormal clinical signs in four categories including temperature, heart rate, respiratory rate, and WBC
d. All of the above

CORRECT ANSWER:

d. All of the above
True or False

Lactate is very important to risk stratify patients with Sepsis. A lactate of more than 2mmol/L indicates Severe Sepsis, and a lactate level of 4mmol/L, associated with hypotension has a mortality rate which approaches 50%.
True or False
Lactate is very important to risk stratify patients with Sepsis. A lactate of more than 2mmol/L indicates Severe Sepsis, and a lactate level of 4mmol/L, associated with hypotension has a mortality rate which approaches 50%.

CORRECT ANSWER:
True
True or False

Mortality increases by 7.6% for every one hour delay of initiation of antibiotics in a hypotensive, septic patient
True or False

Mortality increases by 7.6% for every one hour delay of initiation of antibiotics in a hypotensive, septic patient

CORRECT ANSWER:

True
BPA stands for Best Practice Advisory. A SIRS BPA has been designed to alert the nurse and provider when a patient has SIRS. In response to this BPA the provider will perform which of the following:

a. Determine if an infection is present or suspected as a cause of SIRS
b. Order necessary labs to determine etiology of Sepsis and if Severe Sepsis is present
c. Order a lactate to risk stratify the patient if an infectious etiology is suspected
d. Initiate a “Sepsis Call” response and severe sepsis order set if a patient has Severe Sepsis
e. All of the above
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d. Initiate a “Sepsis Call” response and severe sepsis order set if a patient has Severe Sepsis
e. All of the above

CORRECT ANSWER:

e. All of the above
The Goal of treating Sepsis is to identify patients at risk, obtain labs and cultures, initiate fluid resuscitation management, and initiate antibiotic therapy. When Severe Sepsis is identified the provider will activate a “Sepsis Call” response team with the purpose of which of the following:

a. Initiate antibiotics within 60 minutes
b. Initiate IV fluid therapy within 30 minutes
c. Both a and b
d. None of the above
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CORRECT ANSWER:

c. Both a and b
Click Here to Complete