

Improving Sepsis Outcomes

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6/9/16

Overview

- **Background**
- **Sepsis Program Goals**
- **Bundle**
 - Gaps
 - Strategies
- **Outcomes/Results**
- **Questions**

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Sepsis Background

- Number one driver of mortality.
- Kills more than **215,000** people each year.
- 6th most common cause of hospitalization.
- Single most expensive condition for hospitalization.
- **20-30%** of ICU admissions.
- **40%** of ICU costs.
- **25%** of 30 day readmission rate.
- **48%** of 180 day readmission rate.

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Sepsis Program Goals

- Decrease sepsis mortality rate.
- Increase recognition of sepsis to increase early treatment and survival.
- Decrease LOS and costs.
- Close gap between coding and documentation.
- Chart review to close gaps in care.
- Increase bundle compliance.
- Staff/physician education.
- Seamless care for sepsis patients regardless of where diagnosed.

Surviving Sepsis Campaign

1. Measure lactate level.
2. Obtain blood cultures prior to administration of antibiotics.
3. Administer broad spectrum antibiotics .
4. Administer 30 mL/kg crystalloid IV fluids for hypotension or lactate ≥ 4 .
5. Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) 65mm Hg .
6. Reassessment of volume status & tissue perfusion.
7. Re-measure lactate if initial lactate was elevated (≥ 2).

1. Lactate

- **Gaps**
 - Late identification of sepsis, especially in med-surg units.
- **Best Practice**
 - Screen patients for sepsis in triage and each shift in med-surg units.
 - Consistent use of sepsis order set upon identification.



ED Screening for Nursing

Sepsis Screening Section A Infection

Infection Criteria Present	<input checked="" type="checkbox"/> Documented/Suspect Infect <input type="checkbox"/> Post Op/Invasive Proc <input type="checkbox"/> Immunocompromised
Any Answers	<input checked="" type="radio"/> Yes <input type="radio"/> No
Checked In Section A Infection	If No, continue triage.

Sepsis Screening Section B SIRS

Systemic Inflammatory Response Syndrome	<input type="checkbox"/> HR \geq 90 <input type="checkbox"/> Temp \geq 100.4 F/38 C <input type="checkbox"/> RR \geq 20 <input type="checkbox"/> Temp \leq 96.8/ $<$ 36 C <input type="checkbox"/> WBC $<$ 4, $>$ 12, Or 10% Bands <input type="checkbox"/> Neuro-Alt LOC/Confusion
Two Or More Answers Or Neuro Changes In Section B = +Screen	<input type="radio"/> Yes <input type="radio"/> No If No, Continue to Monitor. If Yes, Notify Physician.
Notified Physician	<input type="radio"/> Yes <input type="radio"/> No Comment

In-Patient Screening

Infection Criteria Present	<input type="radio"/> Documented Infection <input type="radio"/> Immunocompromised <input type="radio"/> Suspected Infection Suspected infection examples (not limited to): pneumonia, UTI, central line, dialysis catheter or PICC line infection, soft tissue infection, or peritonitis.
Any Answers Checked In Section A- Infection	<input type="radio"/> Yes <input type="radio"/> No
B- SIRS	
Systemic Inflammatory Response Synd (SIRS) Criteria Present	<input type="checkbox"/> HR >90 <input type="checkbox"/> Temp over 100.3F/ 38C <input type="checkbox"/> RR >20 <input type="checkbox"/> Temp below 96.6F/36C <input type="checkbox"/> WBC <4, >12, Or 10% Bands <input type="checkbox"/> Neuro- Alt. in LOC
Two Or More Answers Checked In Section B- SIRS	<input type="radio"/> Yes <input type="radio"/> No
If Yes in A and Yes in B = Positive Sepsis Screen	<input type="text"/> Notify your appropriate team member for positive sepsis screen.
If Positive Sepsis Screen- Name Of Individual Notified	<input type="text"/>
C- OrganDysfunction-Severe Sepsis Screen	
Organ Dysfunction Criteria Present (Acute Only, Not Chronic)	<input type="checkbox"/> Altered LOC/Confusion <input type="checkbox"/> Creatinine>2 &/Or Low UOP <input type="checkbox"/> Sat <90% On RA <input type="checkbox"/> Platelets <100,000 <input type="checkbox"/> SBP<90/map<65 p Fluid Res <input type="checkbox"/> Total Bili >2.1 <input type="checkbox"/> PaCO2 <32 mmHg <input type="checkbox"/> Lactic Acid >2 mmol/L <input type="checkbox"/> CO2 <20 mmol/L (on BMP) <input type="checkbox"/> Incrsed Bld Glucose-no DM Low UOP= <0.5 ml/kg/hr Increased Boood Glucose= >140 mg/dL
Any Answers Checked In Section C- Organ Dysfunction	<input type="radio"/> Yes <input type="radio"/> No
Severe Sepsis Screen	
Severe Sepsis Screen	<input type="text"/> If Positive Sepsis Screen, suggests Severe Sepsis. Notify your appropriate team member for positive severe sepsis screen.
If Positive Severe Sepsis - Name of Individual Notified	<input type="text"/>

2. Blood Cultures

- **Gaps**
 - Difficult lab draws.
 - Timing on lab specimen versus timing in electronic medical record.
 - Late identification of sepsis.
- **Best Practice**
 - Screen patients for sepsis in triage and each shift in med-surg units.
 - Consistent use of sepsis order set upon identification.
 - Blood culture pre-checked on order set.
 - Code Sepsis where teams follow a protocol checklist.



3. Antibiotics: Gaps

- Early recognition.
- Process flow for antibiotic administration.
 - Can result in delayed or missed dose.
- CMS monotherapy for broad spectrum may not be appropriate for specific patient population based on antibiogram.
- Availability of the antibiotics.
- When there is need to administer two antibiotics for broad spectrum coverage, the second antibiotic may be delayed.



3. Antibiotics: Best Practice

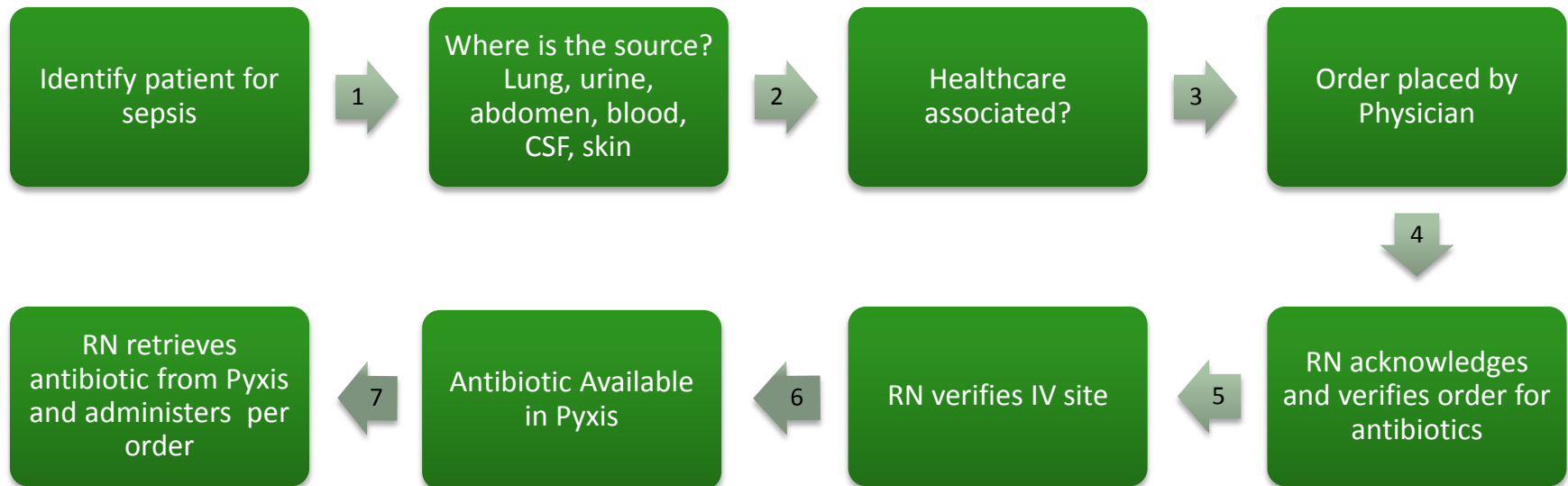
- Screen patients for sepsis in triage and each shift in med-surg units.
- Consistent use of sepsis order set upon identification.
 - Simple way for physicians to choose the appropriate antibiotics.
- Have antibiotics readily available.
- 24/7 sepsis nurse.



3. Antibiotics

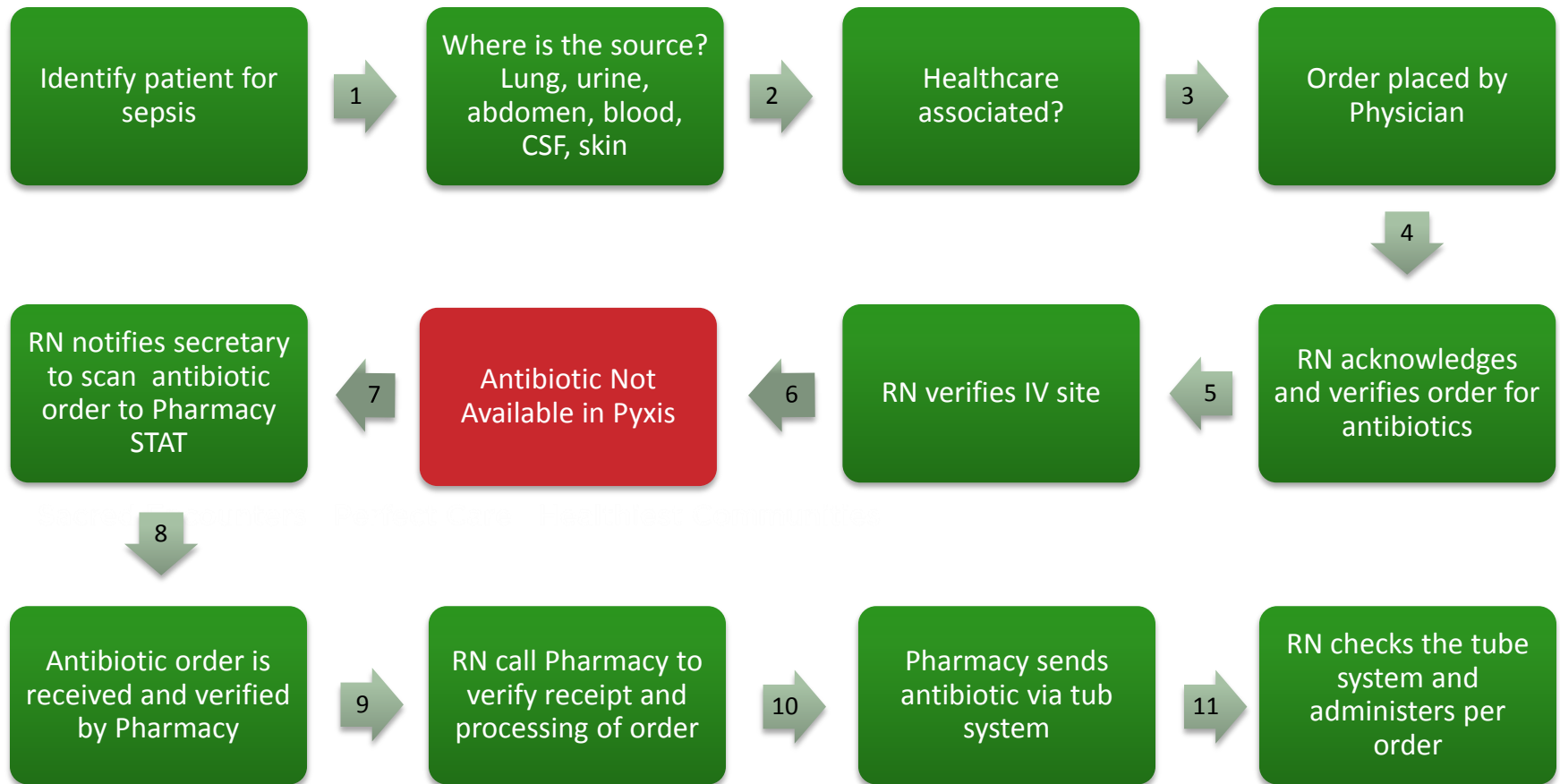
SJ-ED-Sepsis-Soft-Tissue-Infx	
Suggested Initial Empiric Anti-infective Therapy for Pts with Diagnosis of Sepsis	
**SOFT TISSUE INFECTION	
*First-line Abx: Select Zosyn *AND* Vancomycin	
<input type="checkbox"/> Zosyn 3.375 Gm IVPB stat ONE	
BOTTLE COMMENT: Over 30 mins after blood cultures (if ordered). (Generic: Piperacillin-Tazobactam). *To be given in ED only*	Edit
<input type="checkbox"/> Vancomycin (Vancocin) 1 Gm IVPB stat ONE	
BOTTLE COMMENT: Over 60 mins after blood cultures (if ordered). *To be given in ED only*	Edit
*For necrotizing polymicrobial infections,	
ADD Clindamycin to Zosyn + Vancomycin	
<input type="checkbox"/> Clindamycin (Cleocin) 900 Mg IVPB stat ONE	
BOTTLE COMMENT: Over 60 mins after blood cultures (if ordered). Black box warning. *To be given in ED only*	Edit
*Abx for Beta-lactam Allergy:	
Select Levofloxacin *AND* metroNIDAZOLE *AND* Vancomycin	
REMINDER: Beta-Lactam Allergy = IgE-mediated reactions: anaphylaxis, bronchospasm, or severe rash	
<input type="checkbox"/> Levofloxacin (Levaquin) 500 Mg IVPB stat ONE	
BOTTLE COMMENT: Over 60 mins after blood cultures (if ordered). Black box warning. *To be given in ED only*	Edit
<input type="checkbox"/> Metronidazole (Flagyl) 500 Mg IVPB stat ONE	
BOTTLE COMMENT: Over 60 mins after blood cultures (if ordered). Black box warning. *To be given in ED only*	Edit
<input type="checkbox"/> Vancomycin (Vancocin) 1 Gm IVPB stat ONE	
BOTTLE COMMENT: Over 60 mins after blood cultures (if ordered). *To be given in ED only*	Edit

3. Process Flow for Antibiotics in ED



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3. Process Flow for Antibiotics in ED



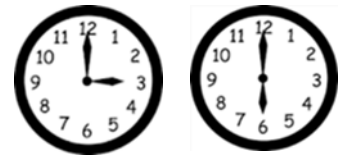
4. IV Fluid: Gaps

- Primarily manual abstraction.
- Confusion regarding where to document bolus in EMR.
- Current process of documenting fluid bolus per weight based protocol in Medication Record will not translate to new coding standards.
- Meditech limitations for documentation of bolus in I and O Record.
- Accuracy of Input and Output.
- Need education for appropriate process for fluid challenge.
- Partial fluid resuscitation– (CHF, Dialysis, ARDS).
- Is it part of the 3 hour bundle or the 6 hour bundle?



4. IV Fluids: Best Practice

- 24/7 Sepsis Nurse.
- Order set includes 30mL/kg in ED and Critical Care order set with a single click for physicians.
- Align compliance rates with departmental goals and physician contracts.
- Align strategic goals and outcomes to physician contracts.



4. 30 mL/kg IV Fluid Order

SJ-ED-Sepsis-Med

IV Fluids: Fluid Resuscitation Initial Bolus Crystalloids

REMINDER: If the 30 mL/Kg fluid bolus order below is not ordered, the provider must document a contraindication

Ns 250 MI IV once PRN (See Label Comment)

BOTTLE COMMENT:
Over 15 min X 1 Prn to maintain CVP > 8 mmHg if a CVP present.
***To be given in ED only*

[Edit](#)

x 1 Days

NS 30 mL/kg Bolus
0 ML IV once ONE - Protocol

DOSE INSTRUCTIONS:
See Protocol

COMMENTS:
Bolus 30 mL/Kg @ 999 mL/Hr per Protocol for Severe Sepsis, Septic Shock (SBP<90 mmHg) or Lactate level > 2 mmol.
***To be given in ED only*

[Edit](#)

PROTOCOL:

Condition	Dose/Route	Instructions
If Pt Wt < Or = 33.3 Kg	Give 1,000 MI Ns Bolus	
If Pt Wt 33.4 Kg To 50 Kg	Give 1,500 MI Ns Bolus	
If Pt Wt 50.1 Kg To 66.6 Kg	Give 2,000 MI Ns Bolus	
If Pt Wt 66.7 Kg To 83.3 Kg	Give 2,500 MI Ns Bolus	
If Pt Wt 83.4 Kg To 100 Kg	Give 3,000 MI Ns Bolus	
If Pt Wt 100.1 Kg To 116.6 Kg	Give 3,500 MI Ns Bolus	
If Pt Wt 116.7 Kg To 133.3 Kg	Give 4,000 MI Ns Bolus	
If Pt Wt 133.4 Kg To 150 Kg	Give 4,500 MI Ns Bolus	
If Pt Wt > 150.1 Kg	Give 5,000 MI Ns Bolus	And Re-Assess

NS
IV ONE 150 MLS/HR

BOTTLE COMMENT:
Start after IV Boluses and CVP > 8 mmHg. ***To be given in ED only*

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5. Vasopressors

- **Gaps**
 - Varying practice for initiating vasopressors in the ED.
 - Manual abstraction of data required.

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6. Reassessment of Volume Status and Tissue Perfusion (Literature)

- In the Event of Persistent Arterial Hypotension Despite Volume Resuscitation (Septic Shock) or Initial Lactate ≥ 4 mmol/L (36 mg/dL) measure the following:
 - Central Venous Pressure (CVP).
 - Central Venous Oxygen Saturation (ScvO₂).



6. Reassessment of Volume Status and Tissue Perfusion (CMS)

- Physician/APN/PA document all the following:
 - Vital signs
 - Cardiopulmonary status
 - Capillary refill
 - Peripheral pulses
 - Skin assessment
- OR
- Complete any two:
 - CVP
 - SvO₂
 - Bedside cardiovascular US
 - Passive leg raise by physician/APN/PA or fluid challenge

Must be documented at or after identification of septic shock and within 6 hour window.

6. Physician Documentation

Document: Sepsis Documentation - Sepsis Documentation

SEPSIS

Sepsis Documentation Type

Document type sepsis -physical exam sepsis -bedside monito...

Vital Signs

Vital signs Vital Signs 8 hrs Date Time TempPulseRespB/PPulse Oxo2 DeliveryO2 Flow RateFiO29/24/...

Sepsis - Physical Exam

Chest	clear no rales	crackles no crackles	wheezes OTHER	rhonchi	dullness	rales	no wheezes
Cardiovascular	regular rate and rhythm bigeminy OTHER	trigeminy	bradycardic heart rate erratic	tachycardic irregular	gallop rhythm rub	murmur	
Capillary refill	normal	brisk	delayed	absent	OTHER		
Peripheral pulses	normal	strong	weak	absent	by Doppler	OTHER	
Skin color	normal color mottled	erythematous	flushed	pale	cyanotic	pink	

Sepsis - Bedside Monitoring

CVP measures less than 8 8 - 12 greater than 12

ScvO2 measures greater than or equal 7... less than 70%

Bedside ultrasound performed Yes No

Passive leg raise/fluid bolus Yes No

Care Plan and Time Spent

Care plan: as ordered

Critical care time/minutes

7. Repeat Lactate

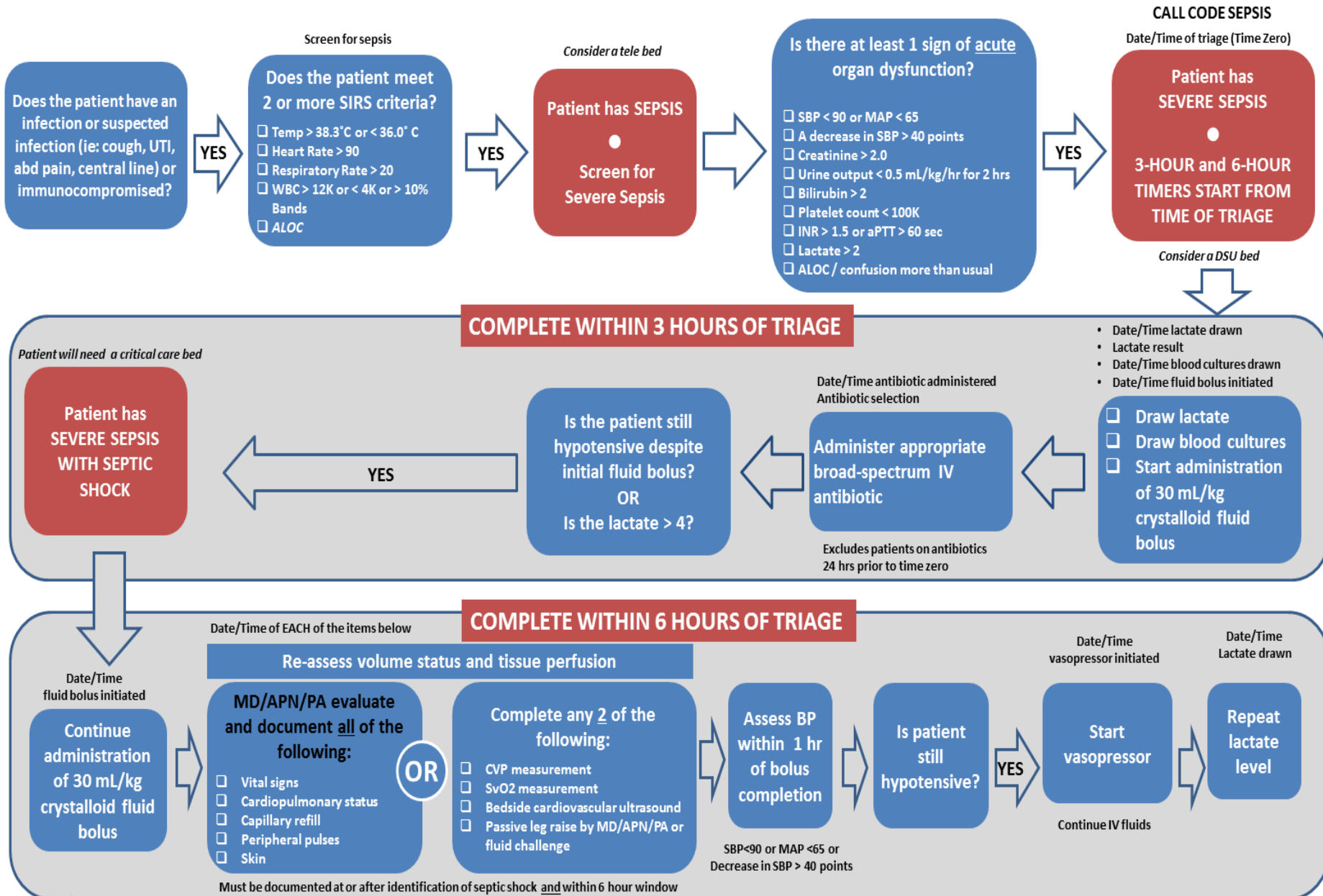
- **Gaps**
 - If order is pre-checked for 4 hours later and the patient is admitted prior to that lab draw, the order will be missed unless reordered.
 - Not all ED physicians use the standardized order sets.
- **Best Practice**
 - Pre-checked repeat lactate in 4 hours in order sets.
 - Require physicians to use the standardized order sets.
 - 24/7 Sepsis RN.

Based on the findings of the National Sepsis Campaign

SEPSIS Screening & Treatment in ECC

EXCLUSIONS (must be documented by Physician/APN/PA)

- Patient expires or is placed on comfort measures only within 3 hours of triage for severe sepsis
- Patient expires or is placed on comfort measures only within 6 hours of triage for septic shock
- Patient or surrogate refuses blood draws, fluids, or antibiotics
- Patient is a transfer from another hospital or ambulatory surgery center



Dedicated Sepsis RN

- Rapid Response Nurse with expertise in evidence-based treatment guidelines for sepsis.
- Promote early goal directed therapy.
- Increase compliance with all bundle elements.

Sepsis RN Checklist

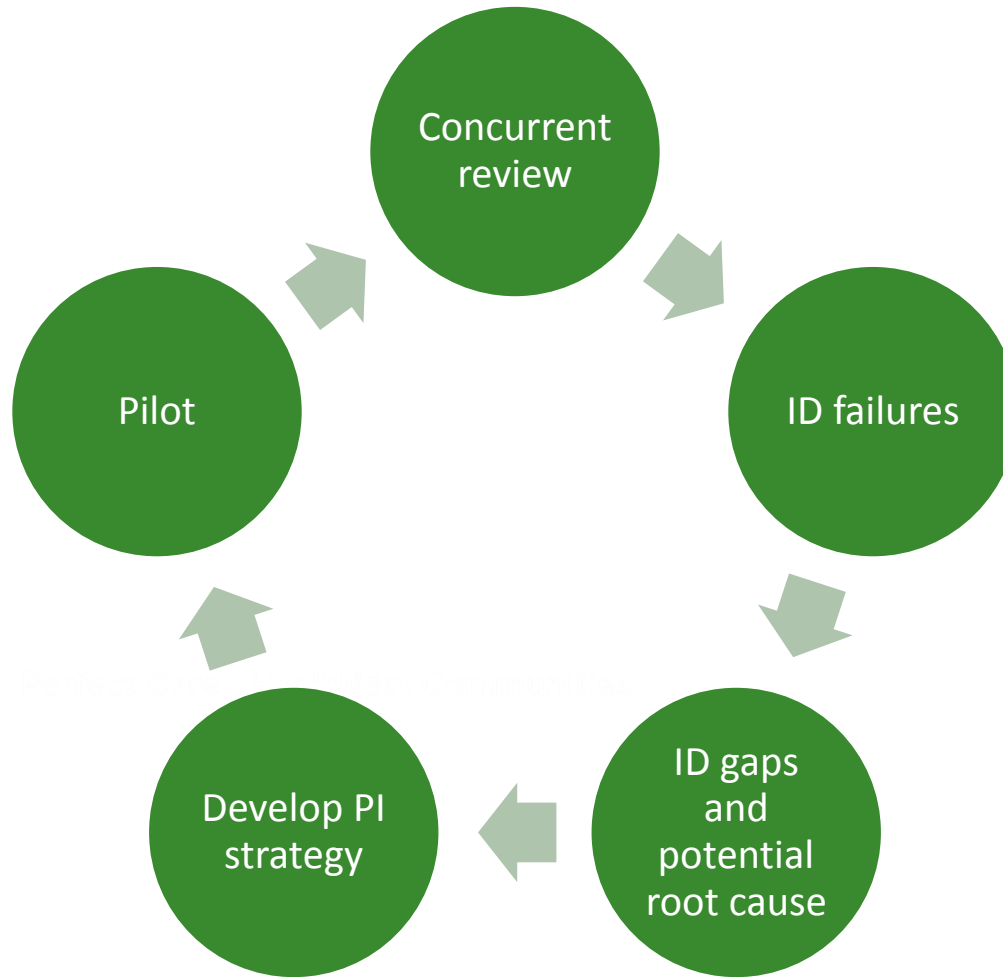
Patient Sticker	Sepsis Identification (All suspected Sepsis patients)	3 Hr Bundle Compliance (For all identified Severe Sepsis patients)	6 Hr Bundle Compliance (For all identified Severe Sepsis & Septic Shock patients)	24 Hour Proactive Rounding (PTS NOT admitted to MICU)
NAME _____ AA# _____ MM# _____ DOB _____	DATE: _____ TIME ZERO: _____ (severe sepsis first identified in ED or on the floor) DEPARTMENT IDENTIFIED: ECC: <input type="checkbox"/> YES <input type="checkbox"/> NO If NO: Other unit _____ RRT Call Time: _____ TYPE OF CALL: <input type="checkbox"/> Code Sepsis (Emergent ED/IP) <input type="checkbox"/> Sepsis Consult <input type="checkbox"/> High Alert Report Positive Screen / Proactive Rounding ORDER SET: <input type="checkbox"/> YES <input type="checkbox"/> NO PHYSICIAN: _____	3 HR TIME GOAL: _____ SEVERE SEPSIS CRITERIA: Suspected OR Known Infection: <input type="checkbox"/> YES <input type="checkbox"/> NO At least 2 SIRs: <input type="checkbox"/> YES <input type="checkbox"/> NO Lactate >2: <input type="checkbox"/> YES <input type="checkbox"/> NO Acute Organ Dysfunction: <input type="checkbox"/> YES <input type="checkbox"/> NO Type of Acute Organ Dysfxn (Select below) 3 HR BUNDLE ELEMENTS Initial Lactate: <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ Lactate Level: _____ BC: <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ ABX: <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ Initial Fluid Challenge: <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____	6 HR TIME GOAL: _____ SEPTIC SHOCK CRITERIA: Lactate \geq 4 mmol: <input type="checkbox"/> YES <input type="checkbox"/> NO Hypotensive after initial fluid challenge complete: <input type="checkbox"/> YES <input type="checkbox"/> NO 6 HR BUNDLE ELEMENTS 2nd lactate drawn (If initial lactate >2 & must be done AFTER fluid challenge): <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ RESULT: _____ Initial 30 mL/kg fluid challenge completed <i>(only if shock):</i> <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ TOTAL FLUID GIVEN: _____ Provider Reassessment note completed <i>(only if shock)</i> (check if done by provider by the 5 th hour): <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ Vasopressors <i>(only if shock, especially if still hypotensive after fluids):</i> <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____	UNIT ADMITTED: <input type="checkbox"/> MICU/CVICU 7-12 <input type="checkbox"/> DSU/CVICU 1-6 <input type="checkbox"/> OTHER (Rm #): _____ 1st Proactive Rounding completed: <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ 2nd Proactive Rounding completed: <input type="checkbox"/> YES <input type="checkbox"/> NO Time: _____ HANDED OFF TO MET RN: <input type="checkbox"/> YES <input type="checkbox"/> NO
	SIRS CRITERIA <input type="checkbox"/> Temp > 100.4 F or < 97 F <input type="checkbox"/> HR > 90 BPM <input type="checkbox"/> RR > 20 breaths/min <input type="checkbox"/> PaCO ₂ < 32 mmHg <input type="checkbox"/> WBC > 12,000 cells/mm ³ , < 4,000 cells/mm ³ , > 10% Bands	ACUTE ORGAN DYSFUNCTION <input type="checkbox"/> NEURO: ALOC, Confusion <input type="checkbox"/> RESPIRATORY: Tachypnea, PaO ₂ < 70mmHg, SaO ₂ < 90%, PaO ₂ /FIO ₂ < 300 <input type="checkbox"/> CARDIAC: Tachycardia, Hypotension, Altered CVP <input type="checkbox"/> GENITOURINARY: Oliguria, Anuria, Elevated Creatinine (>2) <input type="checkbox"/> LIVER: Jaundice, Increased enzymes, decreased Albumin, increased PT <input type="checkbox"/> COAGULATION: decreased platelets, increased PT/APTT, decreased Protein C, increased D-Dimer	WHY WAS AN ELEMENT NOT DONE OR DONE ON TIME? COMMENTS / ISSUES (Circle # or Write in Description) 1) NO FLUIDS ORDERED / OR 30 ML/KG FLUIDS NOT ORDERED OR COMPLETED BECAUSE: a. ESRD (1A) b. CHF (1B) c. OTHER (1C): _____ 2) MD THINKS, "NOT SEPSIS" 3) MD SAYS, "It's a viral infection." 4) MD SAYS, "NO ABX because still working up patient/waiting for diagnostics." 5) Uncooperative Staff/MD: (please add description) 6) OTHER:	

Overarching Best Practices

- Sepsis Coordinator
- 24/7 Sepsis RN
- Standardized order sets that are used every time
- Checklist
- Readily available resources
- Consistent method to obtain and disseminate data
- Align outcomes with strategic goals and physician contracts

Best Practices in Sepsis Care | 2015 | St. Joseph Hospital

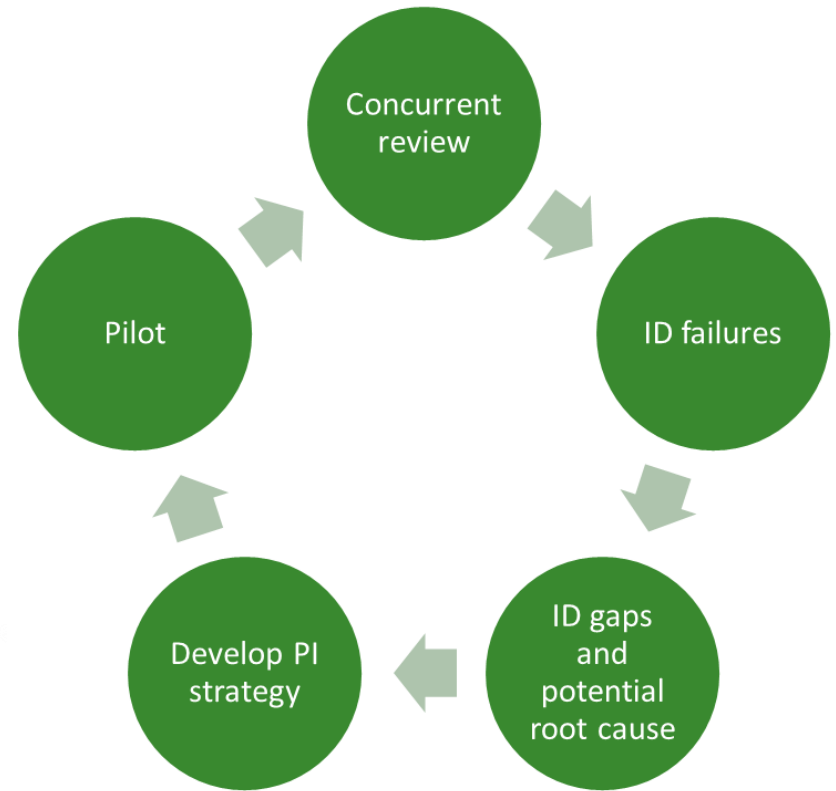
Performance Improvement



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Aligning Documentation with Clinical Performance

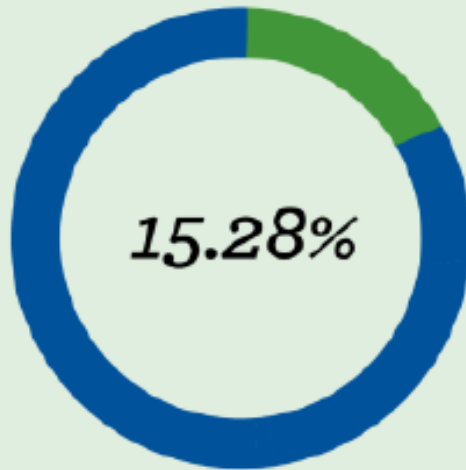
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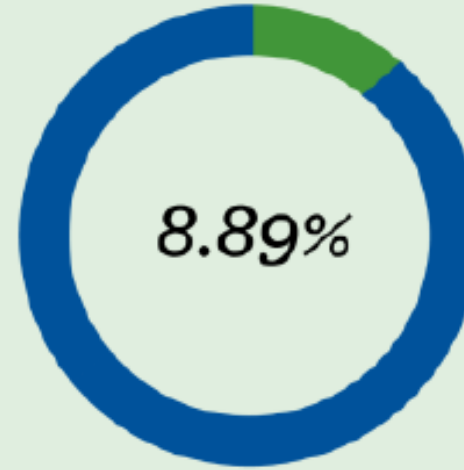
Outcomes / Results

Sepsis Mortality Rate

The percentage of patients who died after contracting sepsis.



January 2015

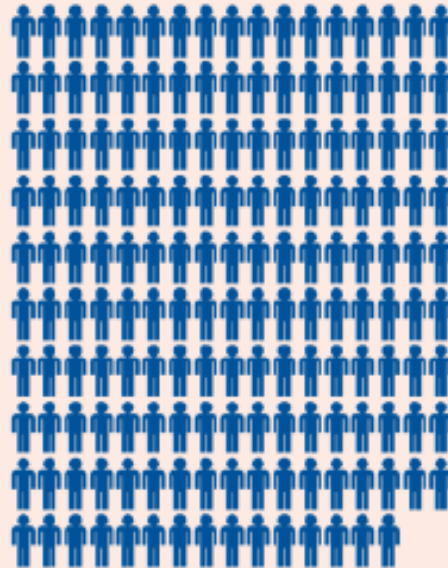


January 2016

Outcomes / Results

Number of Lives Saved

The number of patients who
who were cured of sepsis in our care.



168

July 2015 to January 2016

Questions?

