

# NS-LIJ Health System Emergency Medicine Sepsis Algorithm

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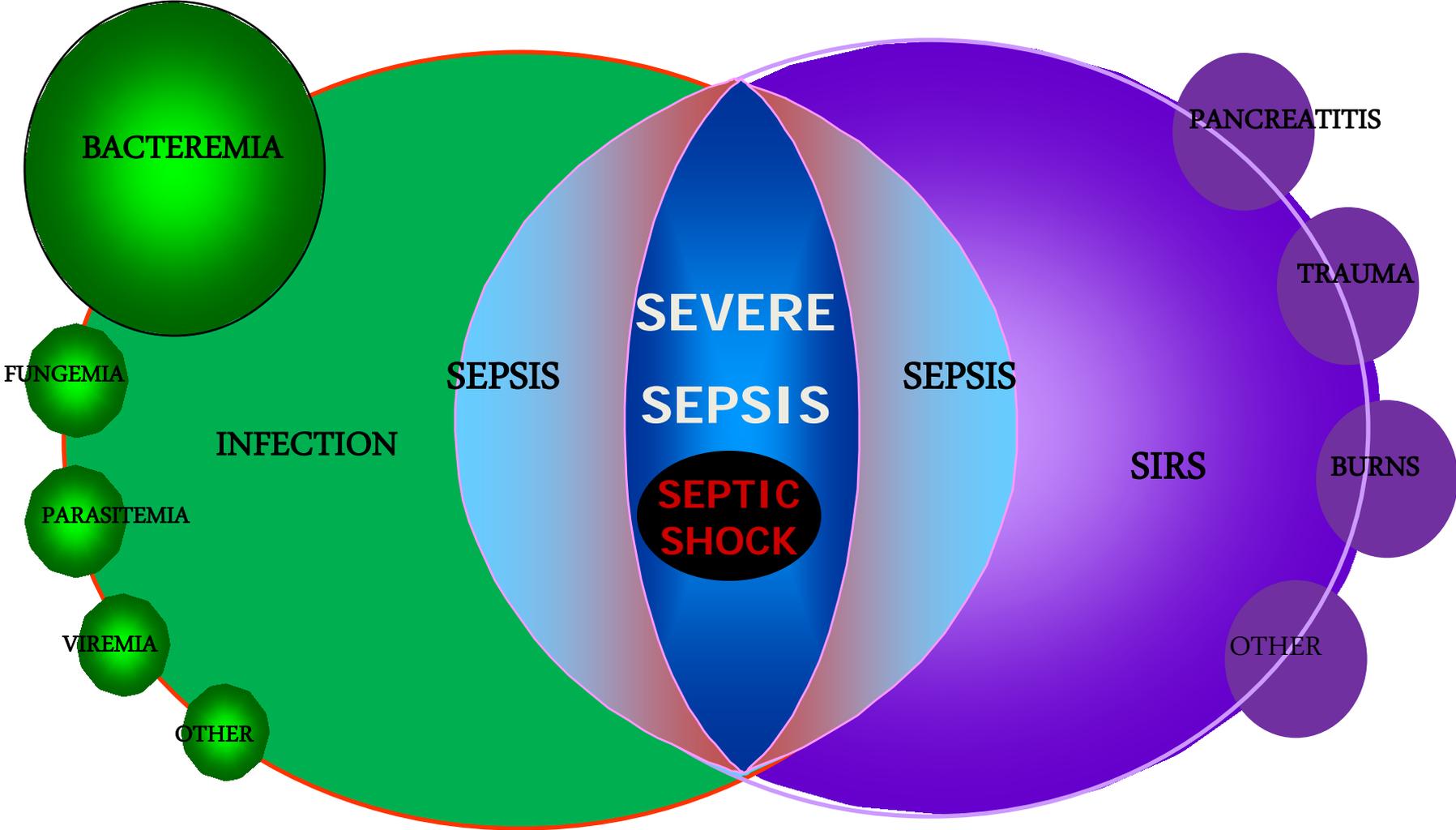
*“These presenters have nothing to disclose.”*

# North Shore-LIJ Health System



- 15 Hospitals (5,000 Beds)
  - 5 Tertiary
  - 7 Community
  - Children
  - Psychiatric
  - 1 Affiliate
- 2 Long Term/Rehab Care Facilities (376 Beds)
- Feinstein Institute
- Hospital and LTC Affiliate Network
- Largest provider in the NY Metro area - 16 % share
- 7 M Service Area Population
- 3.6 million patient contacts
- 278,000 Discharges
- 137,000 Ambulatory Surgeries
- 605,000 Emergency Visits
- 817,000 Home Care Visits
- 67,000 Ambulance Transports
- \$6 Billion in Revenue
- 2nd Largest Secular Health System
- 9,000 Physicians & 10,000 Nurses
- 42,000 Employees
  - L.I.'s Largest Employer
  - NYC's 9<sup>th</sup> Largest Employer
- 3,200 Volunteers
- 2010 NQF National Quality Award
- Hofstra North Shore-LIJ School of Medicine

# Relationship of SIRS, Sepsis, Infection





**Early Goal Directed Therapy**

**Antibiotics and Source Control**

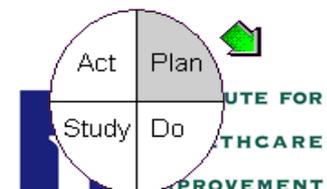
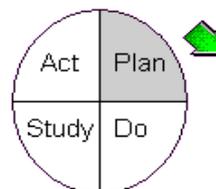
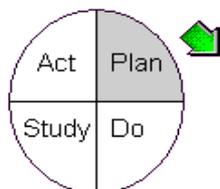
# IHI NS-LIJ Collaborative

## Focus on Reducing Sepsis Mortality

### Two converging pathways:

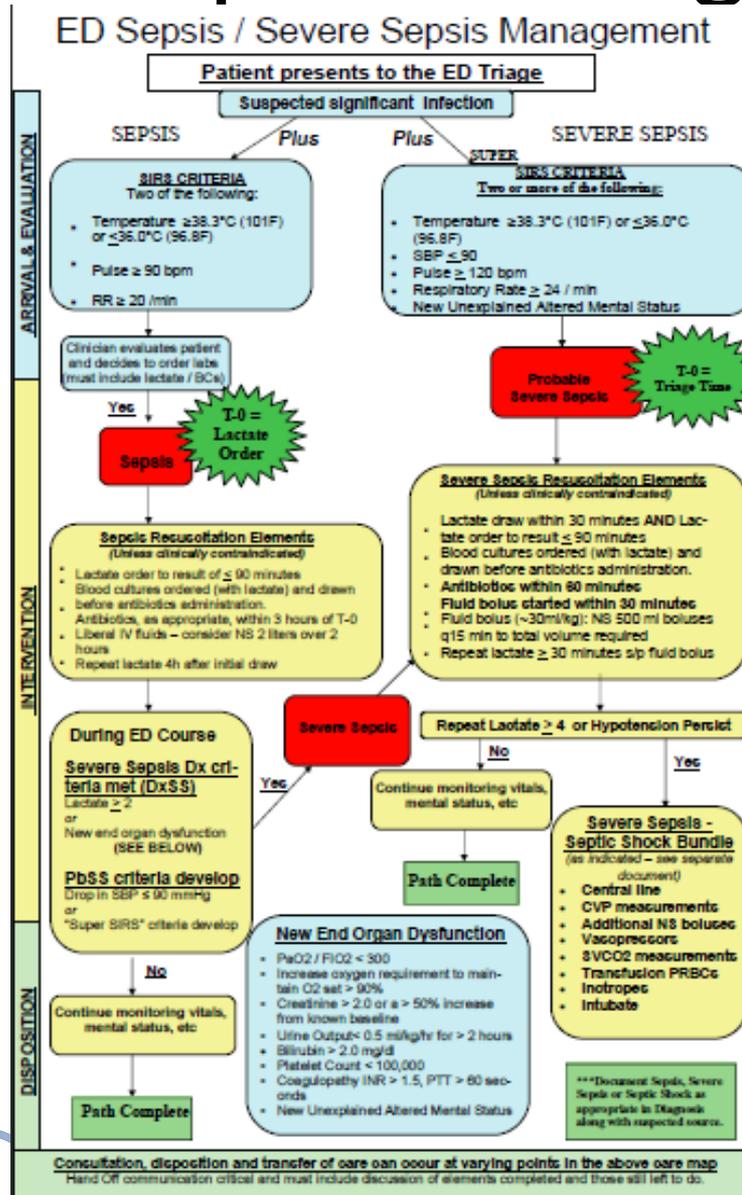
- 1) Increasing reliability with resuscitation bundle in patients with severe sepsis/septic shock identified in the ED and then hospital wide
- 2) Identifying patients on the floors with sepsis before they have progressed to the severe stage

Jan '12	Feb '12	Mar '12	Apr '12	May '12	Jun '12	Jul '12	Aug '12	Sep '12	Oct '12	Nov '12	Dec '12	Jan '13	Feb '13
Onboarding & Preparation	LEARNING SESSION #1		ACTION PERIOD #1			LEARNING SESSION #2	ACTION PERIOD #2			LEARNING SESSION #3	ACTION PERIOD #3		



# ED Sepsis Management Algorithm

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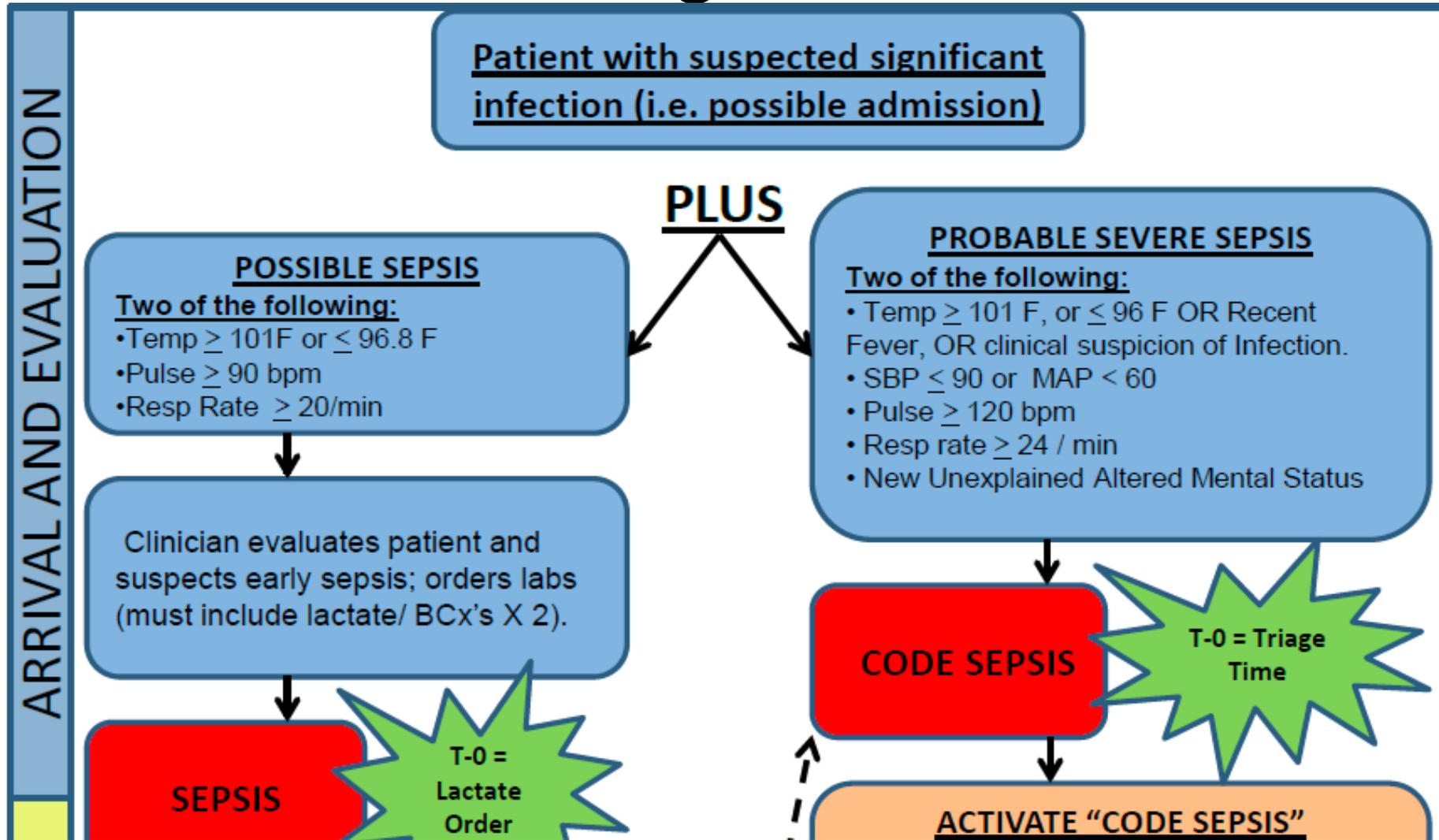


## Severe Sepsis - Septic Shock Bundle (Unless clinically contraindicated)

- **Insert central venous catheter and Measure CVP**  
Repeat 500 NS boluses until CVP  $> 10$  ( $> 14$  if on Vent)  
Vasopressors for refractory hypotension after volume resuscitation  
Norepinephrine: start  $0.05\text{mcg/kg/min}$  (Range  $0.05 - 2\text{ mcg/kg/min}$ )
- **Once CVP in range, check ScvO2**  
If ScvO2  $< 70\%$ , choose one option:  
Hb  $< 7$ : transfuse 1 unit of PRBC  
Additional Fluids: administer an additional liter of saline  
Inotropes: Administer dobutamine  $5-20\text{ mcg/kg/min}$ .  
Intubate: to decrease pulmonary metabolic load
- **Repeat lactate and ScvO2.** If ScvO2  $< 70$  or if lactate still has not cleared by  $\geq 10\%$ , continue with the above options, trending lactates and ScvO2 every 1 hour until these two goals are met.
- **If MAP  $< 65$**  after adequate Fluid Bolus  
Norepinephrine: start  $0.05\text{mcg/kg/min}$ . (Range  $0.05 - 2\text{ mcg/kg/min}$ )

$$\text{MAP} = 1/3 \text{ SBP} + 2/3 \text{ DBP}$$

# ED Algorithm



(must include lactate/ BCx's X 2).

## SEPSIS

T-0 =  
Lactate  
Order

1. Draw labs and document Accurate Blood Culture and Lactate draw times
2. Repeat Vital Signs in 30 minutes

### Sepsis Resuscitation Elements

(Unless clinically contraindicated)

- Lactate ordered and resulted  $\leq 90$  min
- BCx X 2 ordered and drawn before Abx
- Abx  $\leq 3$  hrs of arrival
- IV fluids – consider NS 1 - 2 L over 2 hrs
- Repeat lactate 4h after initial draw
- Monitor, document VS  $\leq q 60$  min

## CODE SEPSIS

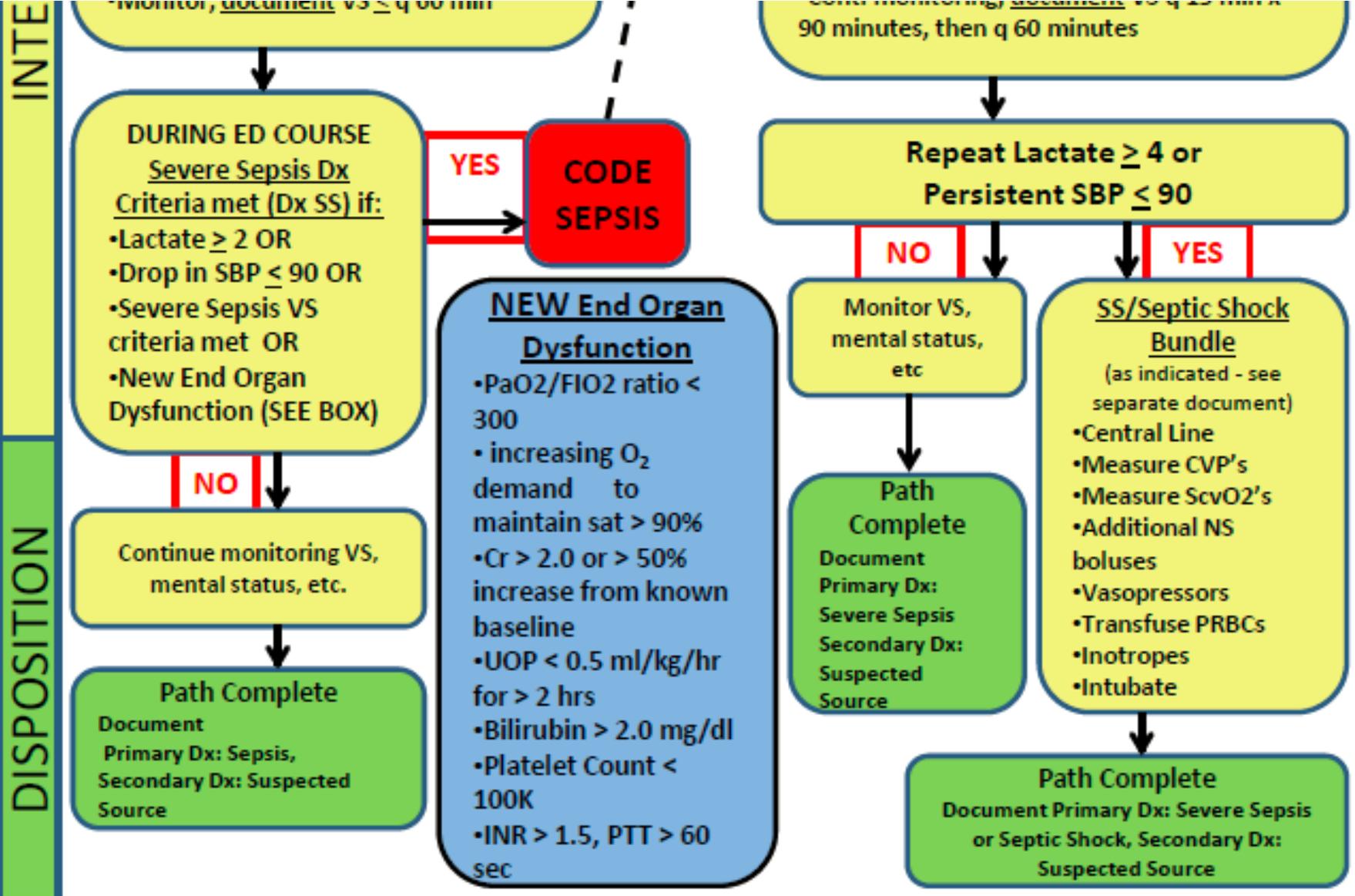
T-0 = Triage  
Time

### ACTIVATE "CODE SEPSIS"

1. OVERHEAD in ED "CODE SEPSIS"
2. Two RNs to bedside if possible.
3. Place  $\geq 18$  G IV, Ask MD re: 2<sup>nd</sup> Line & Foley
4. Draw Labs for Sepsis Panel in  $< 30$  min.
5. Prepare for Fluid Bolus, Alert X-Ray tech

### Severe Sepsis Resuscitation Elements

- Lactate draw  $\leq 30$  min and result  $\leq 90$  min
- BC X 2 ordered and drawn before Antibiotic
- Antibiotics  $\leq 60$  min of Code Sepsis
- IVF bolus started  $\leq 30$  min of Code Sepsis
- Fluids: NS 500 ml boluses q 15 min to total 30ml/kg
- Repeat lactate  $\geq 30$  min s/p fluid bolus
- Cont. monitoring, document VS q 15 min x 90 minutes, then q 60 minutes



Consultation, disposition, and transfer of care can occur at any point in the above care map. Hand off communication is critical and must include discussion of incomplete and complete elements.

# CODE SEPSIS

• Suspected significant infection (i.e. possible admission) with 2 or more of the following:

- Temp  $\geq 101$  F,  $\leq 96.8$  F
- SBP  $\leq 90$  or MAP  $< 60$
- HR  $\geq 120$
- RR  $\geq 24$
- New unexplained AMS

OR

- Lactate  $\geq 2$
- New End Organ Dysfunction Criteria Met

**On arrival or at any point in ED Course**

## Severe Sepsis - Septic Shock Bundle (Unless clinically contraindicated)

- **Insert central venous catheter and Measure CVP**

Repeat 500 NS boluses until CVP > 10 (> 14 if on Vent)

Vasopressors for refractory hypotension after volume resuscitation

Norepinephrine: start 0.05mcg/kg/min (Range 0.05 - 2 mcg/kg/min)

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Norepinephrine: start 0.05mcg/kg/min. (Range 0.05 - 2 mcg/kg/min)

# Performance Goals Summary

- Sepsis plus Super SIRS on arrival
  - T-0 = Triage time
  - T-0 to Antibiotics = 60 Minutes
  - T-0 to Fluid Bolus Initiated = 30 minutes
- All other cases of Sepsis and Severe Sepsis
  - T-0 = Lactate Order Time
  - T-0 to Antibiotics = 180 minutes
- All cases
  - Blood Cultures prior to Antibiotics
  - T-0 to Lactate Draw = 30 minutes
  - Lactate TAT (Order to Result) = 90 minutes