SEPSIS CARE IN THE URGENT CARE

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AGENDA

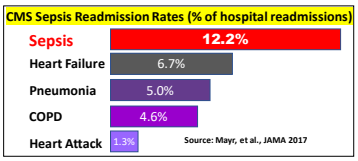
1. Why Sepsis Matters?
2. How to define Sepsis?
3. Sepsis Evaluation & Treatment
4. CMS Core Measure SEP-1 Bundle Measures
5. Sepsis Care Documentation
6. Case Study

Why Sepsis Matters?

THE #1 COST OF HOSPITALIZATION IN THE US – MORE THAN $24 BILLION EACH YEAR

THE LEADING CAUSE OF DEATH IN US HOSPITALS

~ Sepsis Top Diagnosis in KPSCAL
~ High Mortality rate



258,000
sepsis patients will die each year in the U.S. – one every 2 minutes, more than prostate cancer, breast cancer and AIDS combined.

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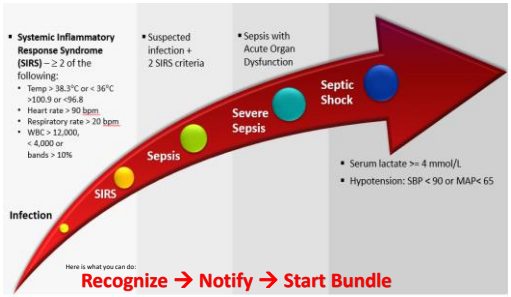
How to Define SEPSIS

Sepsis Progression

Every Minute Matters…



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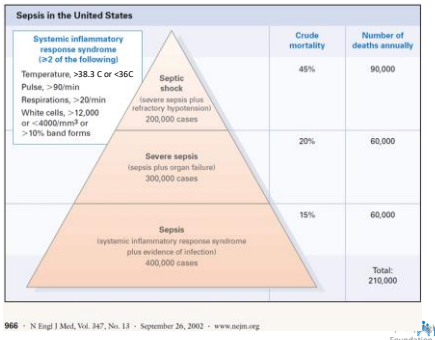
How CMS defines Sepsis?



966 · N Engl J Med, Vol. 347, No. 13 · September 26, 2002 · www.nejm.org

The NEW ENGLAND JOURNAL of MEDICINE

Early Goal-Directed Therapy in the Treatment of Severe S and Septic Shock

Study	Year	Mortality Before (%)	Mortality After (%)
EGDT	1997-2000	46.5	30.5
Ani et al (Severe)	1999-2008	40.0	27.8
Kumar (Severe)	2003-2009	39.6	27.3
Kumar (Shock)	2000-2007	47.1	36.4
Mult Observational	2001-2016	40.3	27.6
ProCESS	2008-2013	18.9	19-20
ProMISE	2011-2014	25.6	24.6
ARISE	2008-2014	18.8	18.6

- "usual" care

3 Recent Large Randomized Control Trials:
Although advanced severe sepsis therapies (such as central line placement, SVO2 goals, etc) did not show improved outcomes, **all were randomized after early recognition and standard therapies including antibiotics and fluid resuscitation.**

Early Recognition

Sepsis Early Recognition

What is **SIRS**?

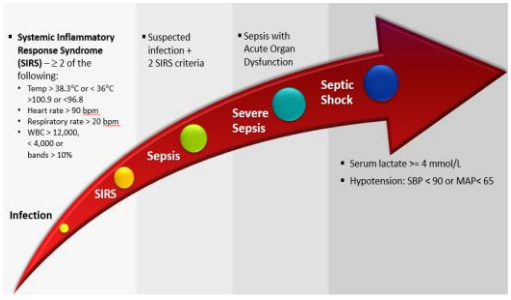
Systemic Inflammatory Response Syndrome
Sepsis: known/suspected infection with 2 or more of the following: • Temp < 96.8°F (36°C) or > 100.9°F (38.3°C) • Heart rate > 90 • Respiratory rate > 20 • Heart rate > 90 • WBC > 12,000/mm³, < 4,000/mm³, or > 10% bands

Sepsis Evaluation & Treatment

What is **SOFA** score?

Acute Organ Dysfunction **SOFA (Sequential Organ Failure Assessment) score:**
• Any reading of systolic BP < 90, MAP < 65, or SBP decrease of more than 40 mm Hg from the last previously recorded systolic BP considered normal • Creatinine > 2.0, or urine output < 0.5 mL/kg/hour for 2 hours (new) • Bilirubin > 2 mg/dL • Altered mental status • Platelet count < 100,000 • INR > 1.5 or aPTT > 60 sec (not on anticoagulation and new) • Lactate > 2 mmol/L • Pulmonary dysfunction as evidenced by need for BiPap or ETT

SIRS + (+) SOFA = Severe Sepsis



Arrive Date_____
Arrive Time_____

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SANTA CLARITA URGENT CARE

Unit SCL UC

SEPSIS SCREENING CRITERIA

Place Patient Sticker

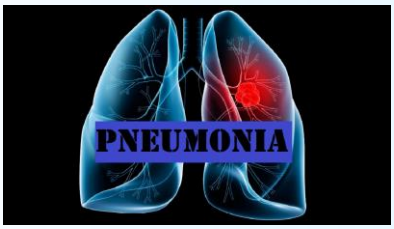
TWO SIRS CRITERIA		SUSPECTED/CURRENT INFECTION
❑ Temp < 96.8 or > 100.9 F ❑ HR > 90 beats/minute ❑ RR > 20 breaths/minute ❑ WBC > 12K or < 4K or > 10% Bands	+	❑ Urinary frequency, burning, odor ❑ Cough, SOB, yellow/green phlegm ❑ Abdominal pain, RUQ pain, RLQ pain ❑ Open draining wounds, cellulitis, abscess ❑ Warm swollen, painful or pus filled area ❑ Other

ERT (Early Recognition Time): Suspected infection plus 2 SIRS Criteria _____(time)
Inpatient: RRT called (Time): _____ ED: MD Notified (Time): _____

REQUIRED INTERVENTIONS

This is an example of Santa Clarita Sepsis Screening Check List

This form to follow patient to the inpatient floors



Early Treatment / Management

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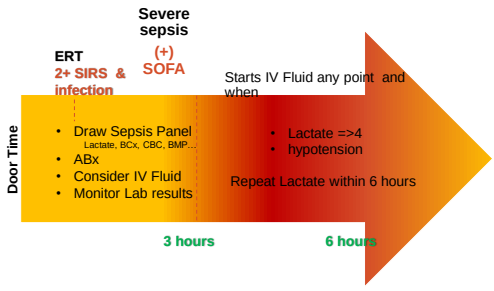
Sepsis Diagnosis and Treatment Timeline



Sepsis Management principles

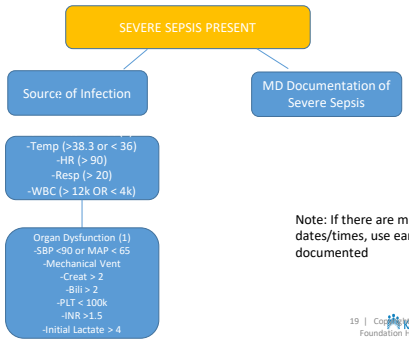
1. Early recognition
2. Source control
3. Early and appropriate antibiotic therapy
4. Early hemodynamic / fluid resuscitation and continued perfusion assessment
5. Proper ventilator management in patients with acute respiratory distress syndrome (ARDS)
6. Documentation

CMS Core Measure SEP-1 Bundle Measures

Sepsis Workup & Treatment

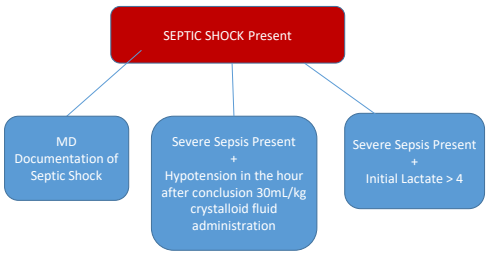
- **Severe Sepsis** —within **3** hours of onset of condition
  1) **Obtain Lactate**
  2) **Obtain blood cultures prior to antibiotics**
  3) **Administer "broad-spectrum" antibiotics**
  4) **Repeat Lactate within 6 hours if initially elevated >2**
- **Septic Shock** —within **6** hours of onset of condition
  1) **Fluid resuscitation (30 ml/kg) (initiate within 3 hours)**
  2) **Assess persistent hypotension by measuring BP x2 within 60 min of fluid completion**
  3) **Vasopressor administration if persistent hypotensive after fluid resuscitation**
  4) **Repeat lactate if initially elevated**
- Note: ED Triage time is 'presentation time' for patients who present with severe sepsis or septic shock, such as urgent care transfer with severe sepsis diagnosed in UC

How to Define Severe Sepsis



Note: If there are multiple dates/times, use earliest documented

How to Define Septic Shock



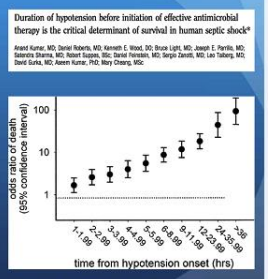
CMS SEP-1 Bundle Measure

Required Action	Severe Sepsis		Septic Shock	
	Three Hour Bundle	Six Hour Bundle	Three Hour Bundle	Six Hour Bundle
Initial Lactate Collection	Yes	Must be completed within three hours of Severe Sepsis Presentation		
Blood Culture Collection	Yes			
Initial Antibiotic Started	Yes			
Repeat Lactate Collection (if Initial Lactate greater than 2)	Yes, within SIX hours of Severe Sepsis			
30mL/kg Crystalloid Fluids Started	N/A	Yes, if initial hypotension	Yes (fluids started)	Yes, (fluids completed)
Vasopressor Given (if decreasing BP persists)	N/A	N/A	N/A	Yes
Repeat Volume Status/Tissue Perfusion Assessment	N/A	N/A		Yes

Antibiotics:
Monotherapy
Combination
Therapy

Time to Antibiotics Matters…

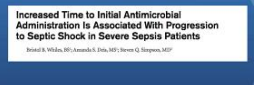
- The "Kumar Study"
- 2006 Retrospective cohort, 14 ICUs (10 hospitals) in Canada and US. 2,154 patients with septic shock
- Survival rate 79.9% for patients receiving antibiotics within first hour of documented hypotension
- For each subsequent hour, average survival decreased by 7.6%.



Kumar et al., Crit Care Med 2006; 34:1589-1596

Time to Antibiotics Matters

- Whiles et al.
- 2017 Retrospective cohort, Single Academic Center. 3,929 sepsis patients (average mortality 12.8%)
- Median Time to Antibiotics = 3.77 hrs [1.96-6.42] for patients progressing to septic shock vs. 2.76 hrs [1.60-4.82] for those who didn't
- Time to first antibiotic dose was associated with progression to septic shock (OR 1.08 [1.06-1.10]) and in-hospital mortality (OR 1.06 [1.05-1.08])



Crit Care Med 2017;45:623-629

Time to Antibiotics Matters…

- NCAL KP Retrospective study - 35,000 sepsis patients (21 centers 2010-2013)
- Median time to antibiotics: 2.1 hours (1.4-3.1)
- Time to antibiotics associated with in-hospital mortality (OR for each hour after registration: 1.09 [1.05-1.13]).
- Absolute mortality increase per hour delay: 0.3% sepsis, 0.4% severe sepsis, 1.8% septic shock


The timing of early antibiotics and hospital mortality in sepsis

AJRCCM 3/27/2017

Bottom Line - *Give The Right Antibiotic…The Right Dose…*

BOTTOM LINE WITH ANTIBIOTICS…

- It is likely that early antibiotics are beneficial
- This effect is particularly seen in septic shock
- GIVE Antibiotics EARLY, but…
- MAKE SURE THEY ARE RIGHT ANTIBIOTIC AND THE RIGHT DOSE

IV Antibiotic Therapy for Sepsis

Monotherapy	Combination Therapy	
Ceftriaxone (Rocephin®) Ceftazidime (Fortaz®) Cefepime (Maxipime®) Levofloxacin (Levaquin®) Ampicillin/sulbactam (Unasyn®) Piperacillin/tazobactam (Zosyn®) Ertapenem (Invanz®) Meropenem (Merrem®)	Aminoglycosides or Aztreonam or Ciprofloxacin	+ Cefazolin or Vancomycin or Clindamycin or Daptomycin or Linezoid or Macrolides or Penicillins

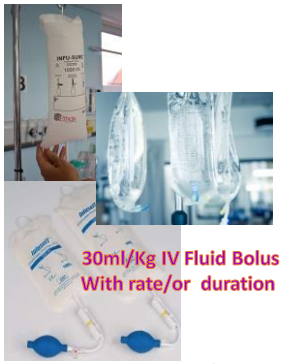
When multiple IV antibiotics are prescribed for SEPSIS, please administer in the following order or call Pharmacy for assistance

FIRST
- Ceftriaxone
- Ceftazidime
- Unasyn (ampicillin/sulbactam)
- Levofloxacin
- Zosyn (piperacillin/tazobactam)
- Ertapenem

THEN
- **Gentamycin**
- **Vancomycin**
- **Ciprofloxacin**
- **Cefazolin**
- **Clindamycin**
- **Azithromycin**

GIVEN LAST
- **Metronidazole**

Fluid Resuscitation



Crystalloid Fluid 30ml/Kg Administration
in CMS SEP-1 Measure has 3 trigger events

- Initial hypotension
- Initial lactate level result >= 4
- Documentation of septic shock

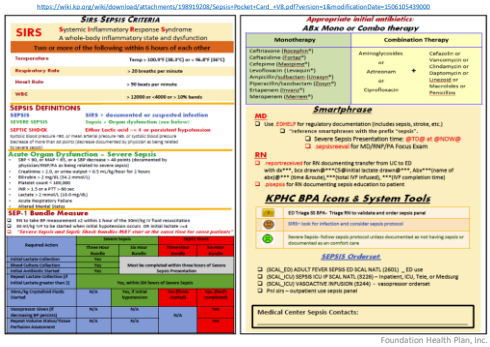
BUT OTHER SEPSIS PATIENTS NEED FLUID RESUSCITATION TOO, JUST NOT THIS AMOUNT FOR SEP-1.

Summary of Sepsis Care Bundle Elements

	Bundle Elements	CMS SEP-1 Measure (Presenting anywhere)
Severe Sepsis Bundles	Population	Inpatients with diagnosis code of " Sepsis, severe sepsis or Septic Shock"
	Time Zero	SIRS + suspected infection + organ dysfunction or documentation of severe sepsis
	Initial Lactate	Within 3 hours
	Blood Cultures	Prior to antibiotics
	Antibiotics	Within 3 hours
	Fluids	No fluid requirement for SEP-1 except (+) initial hypotension
	Repeat Lactate	Within 6 hours if initial lactate level >2
Septic Shock Bundles	Time Zero	Severe sepsis + LA > 4 or SBP < 90 after fluid or documentation of septic shock
	Initial Lactate	Within 3 hours
	Blood Cultures	Obtained prior to antibiotics
	Antibiotics	Within 3 hours
	Fluids	30 mL/kg IV fluids within 3 hours
	Repeat Lactate	Within 6 hours if initial lactate > 2
	Vasopressors	Within 6 hours if hypotension persists after 30 ml/kg IVF
	Focused Reassessment	Within 6 hours (smartphrase)

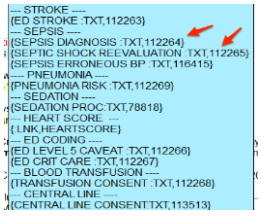
SCAL Sepsis Pocket Card

https://wiki.kp.org/wiki/download/attachments/198919208/Sepsis+Pocket+Card_+VB.pdf?version=1&modificationDate=1506105439000



Sepsis Care Documentation & Smartphrase

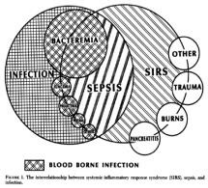
{ED HELP:151307}



Differential Diagnosis for Sepsis

The **differential diagnosis** for **sepsis** is broad and has to examine (to exclude) the noninfectious conditions that may cause systemic signs of SIRS

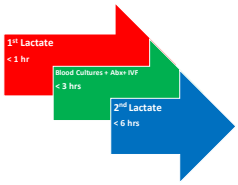
1. Acute Kidney Injury
2. Acute Respiratory Distress Syndrome
3. Cardiogenic Shock
4. Diabetic Ketoacidosis
5. Hemorrhagic shock
6. Hypovolemic shock
7. MI /CHF / atrial fibrillation
8. Stroke / Seizure
9. Pulmonary embolism
10. More…



Optimizing Early Sepsis in Urgent Care

1. **Obtain 1st lactate within 60 minutes of Urgent Care arrival**
2. **Obtain blood cultures before starting antibiotics < 3 hours of Urgent Care arrival**
3. **Appropriate antibiotics < 3 hours of Urgent Care arrival**
4. **Consider IV fluid, Deliver 30 ml/kg IV fluids for LA>4 and/or hypotension.**

Start vasopressors < 3 hours of hypotension onset
Reassess patient and obtain repeat lactate in less than 6 hours.



ABOUT THIS TEMPLATE

Consideration:

Sepsis in OB and in Pediatrics

QUIZZES

#1 It is generally recommended to wait until the patient is Admitted to the ICU before implementing the Severe Sepsis Protocol.

- ☐ True
- ☐ False

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#2 Blood cultures should be obtained and the first antibiotic administered within 3 hours of urgent care admission.

- ☐ True
- ☐ False

#3 Blood Cultures are frequently negative in patients with septic shock.

- ☐ True
- ☐ False

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#4 A 70 y/o ♂ presents to UC w/ 2-day history of fever, chills, cough, and right-sided pleuritic chest pain

T: 101.5°F; P:120 bpm; R:30 ; BP: 70/35 mm Hg; SatO2: 80% RA
CXR: RLL infiltrate

This patient's condition best define as which of the following?

a) Multi-organ dysfunction syndrome (MODS)
b) Sepsis
c) Severe Sepsis
d) Septic shock
e) SIRS

☐

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#4-2 What is the first step in the initial management of this patient?

a) Antibiotic therapy
b) β-Blocker therapy to control heart rate
c) Intravenous (IV) fluid resuscitation
d) Supplemental oxygen and airway management
e) Vasopressor therapy with dopamine

☐

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#5 A 71 y/o ♀ presents to ED for fever, confusion, flank pain, IV Abx started

T: 101.3°F; P:123 bpm; R:27 ; BP: 82/48 mm Hg; SatO2: 80% RA
WBC: 15.6K, UA (+) leukocytes and many bacteria, Lactate : 4.2

Which of the following is most likely to improve survival for this patient?

a) 25% albumin infusion
b) IV fluid bolus 30ml/kg resuscitation
c) Maintaining hemoglobin above 12 g/dL
d) Maintaining a $Paco_2$ below 50 mm Hg
e) Hemodynamic monitoring with a PA catheter

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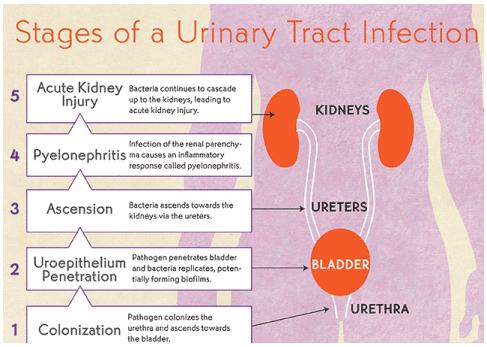
#6 A 5 d/o full term♀ baby presents to UC for low grade fever, fussy, (+) nasal discharge.
Exam: ↓activity, yellow sclerae, (+) subcostal retractions (+) nasal flaring

☐ What are the most appropriate next steps for the care of this infant?

44 44

#7 87 y/o female presents to ED
CC. intermittent fevers x 2 days. Caregiver Reported (+) new-onset incontinence and foul-smelling urine x 1 week

45 45



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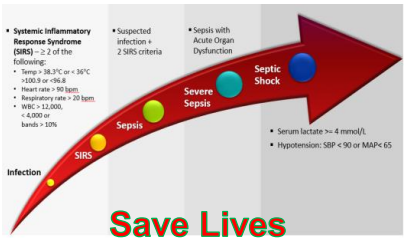
What Should You Be Doing?

Recognize → Notify → Start Bundle



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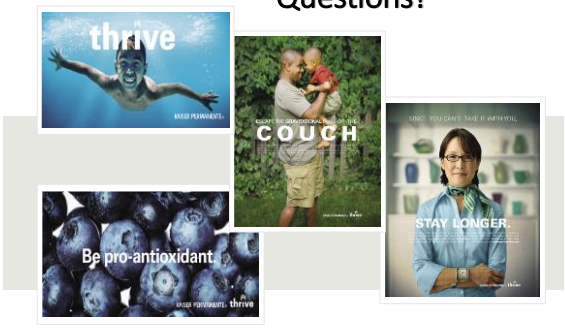
Questions?



Local Medical Center Sepsis Team Contact List:

CONTACT OF MEDICAL CENTER SEPSIS TEAM

SEPSIS	*Physician Champion- Lead- Dr. Ben Broder*	*Non- Physician Champion Helen Sun, RNP*
Anaheim/Irvine	Bryan Hoang Dong, MD Jay Patel, MD	Krystle Kibbe, RN, Connie J Bano, RN
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Baldwin Park	Dicky Shah, MD - ED Champion	Denise D. Reyrata, RN
Downey	Joshua Parnes, ED Ivan Wu, MD (ED Chief)	Debbie Gavieres, RN Gina Buthuis, RN, ED Edu
Fontana	Alp Arkun, MD (ED Chief) Michelle Sperry, MD (Assistant Chief)	Kelly Knight, RN
Harbor City SouthBay	John A Kare, MD - ED Champion Blake C Brown, MD - Inpatient Champion Eric Sandoval, MD - Intensivist Champion Mary-Ann Baquing MD - OBGYN	Philippe Vermette, RN - ED Director Angela Jones, RN Quality
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