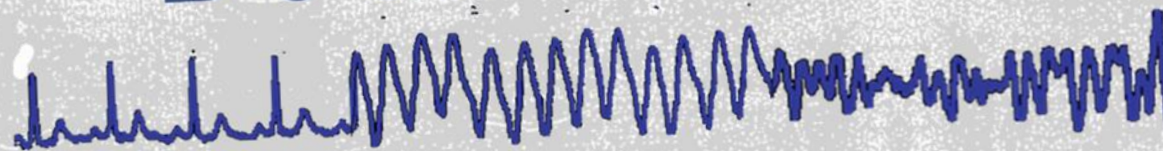
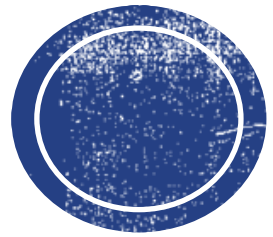




EMERGENCY MEDICINE

BOOT CAMP





INFECTIOUS DISEASE

José A. Rubero, MD, FACEP, FAAEM

Professor

CASE PRESENTATION

- *A 67-year-old male with a history of diabetes and recent pneumonia presents to the ED with confusion, fever, and hypotension. His vitals: BP 85/50, HR 120, Temp 102.4°F, RR 24. He has cool extremities and an elevated lactate.*
- *What's your first thought?*
- Discussion: **Recognizing sepsis early is key. But how do we define it?**



DIFFERENTIAL DIAGNOSIS

- **Sepsis can mimic many conditions, so always consider:**
 - Hypovolemic shock (hemorrhage, dehydration)
 - Cardiogenic shock (MI, arrhythmias)
 - Anaphylaxis
 - Neurogenic shock (spinal cord injury)
- **Septic Shock is defined as:**
- **Sepsis plus persistent hypotension requiring vasopressors despite IV fluids**



CLINICAL FEATURES & DIAGNOSTIC WORKUP

- **Early Sepsis Signs:**

- Fever, tachycardia, tachypnea
- Altered mental status
- Hypotension (late sign)

- **Key Labs:**

- **Lactate (>2 mmol/L):** Tissue hypoxia
- **Blood cultures & CBC:** Infection markers
- **Procalcitonin:** Helps differentiate bacterial from viral infections
- **Chest X-ray, CT, urine analysis:** Identifies the infection source



MANAGEMENT & TREATMENT

- **Early Fluids:** 30mL/kg IV crystalloid bolus
- **Broad-Spectrum Antibiotics ASAP** (before cultures)
- **Vasopressors (Norepinephrine first-line)** if fluids don't correct hypotension
- **Source Control:** Remove infected catheters, drain abscesses



SUMMARY & CLINICAL PEARLS

- **Early antibiotics and IV fluids save lives in sepsis!**
- **Use lactate and qSOFA to recognize sepsis early.**
- **If fluids don't work, start norepinephrine**



CASE PRESENTATION

- *A 25-year-old college student presents with fever, neck stiffness, photophobia, and confusion. His vitals: BP 110/70, HR 110, Temp 101.8°F.*
- *What's the next step?*
- **Classic triad of bacterial meningitis:** Fever, neck stiffness, altered mental status



DIFFERENTIAL DIAGNOSIS

- Meningitis (**inflammation of meninges**) vs. Encephalitis (**brain inflammation**)
- **Consider:**
 - Stroke, intracranial hemorrhage
 - CNS tumors
 - Toxic/metabolic encephalopathies



CLINICAL FEATURES & DIAGNOSTIC WORKUP

- **Meningitis:** Neck stiffness, photophobia, Brudzinski/Kernig signs
- **Encephalitis:** AMS, seizures, focal deficits
- **Key Labs & Imaging:**
 - **LP (CSF Analysis):**
 - Bacterial: High WBCs, low glucose
 - Viral: Lymphocytic predominance
 - **MRI Brain for encephalitis**



MANAGEMENT & TREATMENT

- **Start Empiric Antibiotics IMMEDIATELY** → Ceftriaxone + Vancomycin ± Ampicillin (Listeria risk)
- **Dexamethasone for Strep Pneumo Meningitis**
- **Acyclovir if suspecting viral encephalitis (HSV)**



SUMMARY & CLINICAL PEARLS

- **Never delay antibiotics in suspected meningitis!**
- **Encephalitis = AMS + Seizures, Meningitis = Neck Stiffness + Fever**
- **Always check for contraindications before performing an LP (papilledema, focal deficits).**



OLD DEFINITIONS FOR SIRS

Clinical Spectrum of SIRS

- Infection
 - Identifiable source of microbial insult
- SIRS = 2 or more:
 - Temp $\geq 38^{\circ}\text{C}$ or $\leq 36^{\circ}\text{C}$
 - HR ≥ 90 bpm
 - RR ≥ 20 breaths/min or PaCO₂ ≤ 32 mmHg or mechanical ventilation
 - WBC $\geq 12,000/\mu\text{L}$ or $\leq 4000/\mu\text{L}$ or $\geq 10\%$ band forms
- Sepsis
 - Infection + SIRS
- Severe Sepsis
 - Sepsis + Organ Dysfunction
- Septic Shock
 - Sepsis + Cardiovascular Collapse (requires vasopressors)



QSOFA

Hypotension
Systolic BP
<100 mmHg

Altered
Mental
Status

Tachypnea
RR >22/Min

Score of ≥ 2 Criteria Suggests a Greater Risk of a Poor Outcome

NEW SEPSIS GUIDELINES

Clinical Review & Education

Special Communication | CARING FOR THE CRITICALLY ILL PATIENT

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Christopher Warren Seymour, MD, MSc; Manu Shankar-Hari, MSc, MD, FFICM; Djillali Annane, MD, PhD; Michael Bauer, MD; Rinaldo Bellomo, MD; Gordon R. Bernard, MD; Jean-Daniel Chiche, MD, PhD; Craig M. Coopersmith, MD; Richard S. Hotchkiss, MD; Mitchell M. Levy, MD; John C. Marshall, MD; Greg S. Martin, MD, MSc; Steven M. Opal, MD; Gordon D. Rubenfeld, MD, MS; Tom van der Poll, MD, PhD; Jean-Louis Vincent, MD, PhD; Derek C. Angus, MD, MPH



NEW SEPSIS DEFINITIONS

Box 3. New Terms and Definitions

- Sepsis is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection.
- Organ dysfunction can be identified as an acute change in total SOFA score ≥ 2 points consequent to the infection.
 - The baseline SOFA score can be assumed to be zero in patients not known to have preexisting organ dysfunction.
 - A SOFA score ≥ 2 reflects an overall mortality risk of approximately 10% in a general hospital population with suspected infection. Even patients presenting with modest dysfunction can deteriorate further, emphasizing the seriousness of this condition and the need for prompt and appropriate intervention, if not already being instituted.
- In lay terms, sepsis is a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs.
- Patients with suspected infection who are likely to have a prolonged ICU stay or to die in the hospital can be promptly identified at the bedside with qSOFA, ie, alteration in mental status, systolic blood pressure ≤ 100 mm Hg, or respiratory rate ≥ 22 /min.
- Septic shock is a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality.
- Patients with septic shock can be identified with a clinical construct of sepsis with persisting hypotension requiring vasopressors to maintain MAP ≥ 65 mm Hg and having a serum lactate level > 2 mmol/L (18 mg/dL) despite adequate volume resuscitation. With these criteria, hospital mortality is in excess of 40%.

Abbreviations: MAP, mean arterial pressure; qSOFA, quick SOFA; SOFA: Sequential [Sepsis-related] Organ Failure Assessment.



SOFA SCORES

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score^a

System	Score				
	0	1	2	3	4
Respiration					
Pao ₂ /Fio ₂ , mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, ×10 ³ /μL	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine (any dose) ^b	Dopamine 5.1-15 or epinephrine ≤0.1 or norepinephrine ≤0.1 ^b	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1 ^b
Central nervous system					
Glasgow Coma Scale score ^c	15	13-14	10-12	6-9	<6
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2-1.9 (110-170)	2.0-3.4 (171-299)	3.5-4.9 (300-440)	>5.0 (440)
Urine output, mL/d				<500	<200

Abbreviations: Fio₂, fraction of inspired oxygen; MAP, mean arterial pressure; Pao₂, partial pressure of oxygen.

^a Adapted from Vincent et al.²⁷

^b Catecholamine doses are given as μg/kg/min for at least 1 hour.

^c Glasgow Coma Scale scores range from 3-15; higher score indicates better neurological function.



SOME CRITERIA FROM THE OLD DEFINITIONS

TABLE 2. Severe Sepsis

Severe sepsis definition = sepsis-induced tissue hypoperfusion or organ dysfunction (any of the following thought to be due to the infection)

Sepsis-induced hypotension

Lactate above upper limits laboratory normal

Urine output $< 0.5 \text{ mL/kg/hr}$ for more than 2 hrs despite adequate fluid resuscitation

Acute lung injury with $\text{PaO}_2/\text{FiO}_2 < 250$ in the absence of pneumonia as infection source

Acute lung injury with $\text{PaO}_2/\text{FiO}_2 < 200$ in the presence of pneumonia as infection source

Creatinine $> 2.0 \text{ mg/dL}$ ($176.8 \text{ }\mu\text{mol/L}$)

Bilirubin $> 2 \text{ mg/dL}$ ($34.2 \text{ }\mu\text{mol/L}$)

Platelet count $< 100,000 \text{ }\mu\text{L}$

Coagulopathy (international normalized ratio > 1.5)

Adapted from Levy MM, Fink MP, Marshall JC, et al: 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference. *Crit Care Med* 2003; 31: 1250–1256.

	OLD	NEW
SEPSIS	suspected infection + SIRS	suspected infection + $2 \geq \text{qSOFA}$ or rise in SOFA score by ≥ 2
SEVERE SEPSIS	sepsis + hypotension, hypoxia, elevated lactate or other lab markers of end organ dysfunction	(category removed)
SEPTIC SHOCK	sepsis + hypotension after adequate fluid resuscitation	sepsis + vasopressors + lactate > 2

SEPSIS BEDSIDE CRITERIA



SEPSIS CLINICAL CRITERIA

INFECTION



CHANGE IN:
SEPSIS-RELATED
ORGAN
FAILURE
ASSESSMENT

≥ 2



$\downarrow$ $\text{PaO}_2 / \text{FiO}_2$



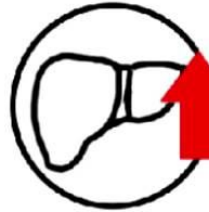
$\downarrow$ HYPOTENSION OR
VASOPRESSORS



$\downarrow$ PLATELETS



$\downarrow$ GLASGOW
COMA SCALE

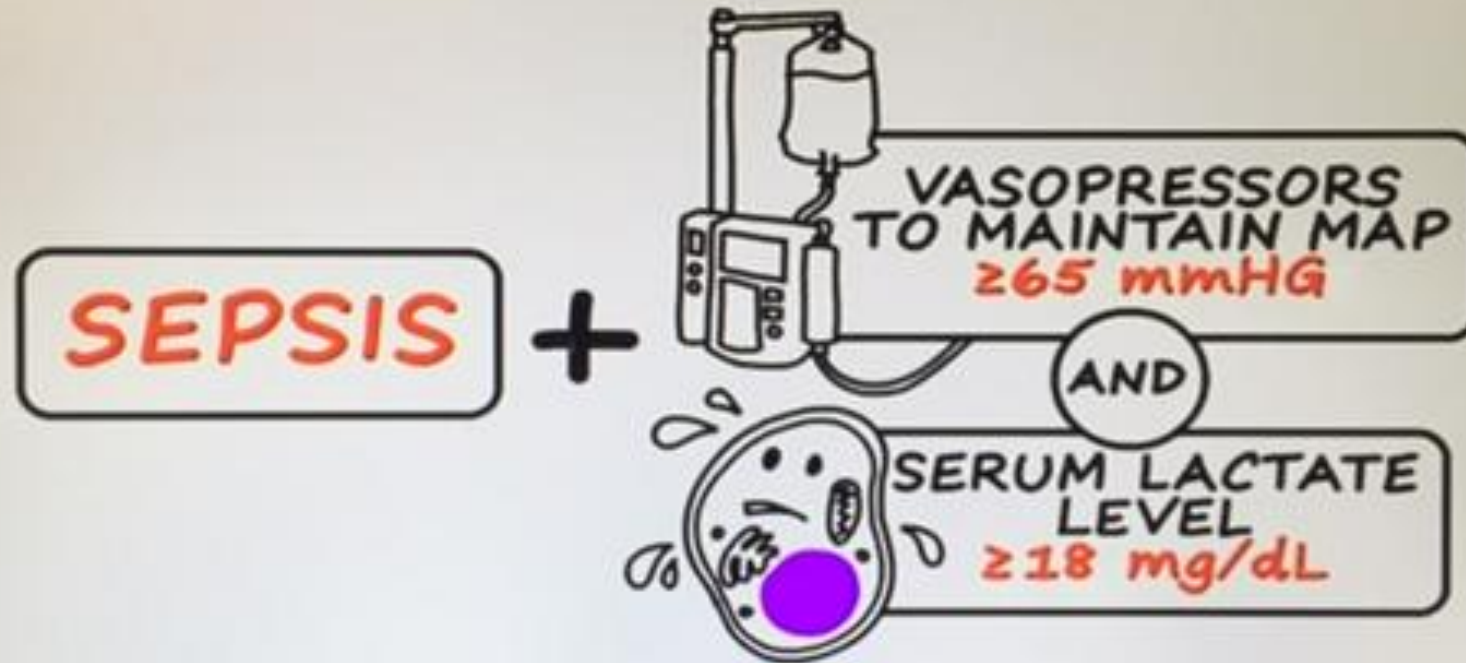


$\uparrow$ BILIRUBIN

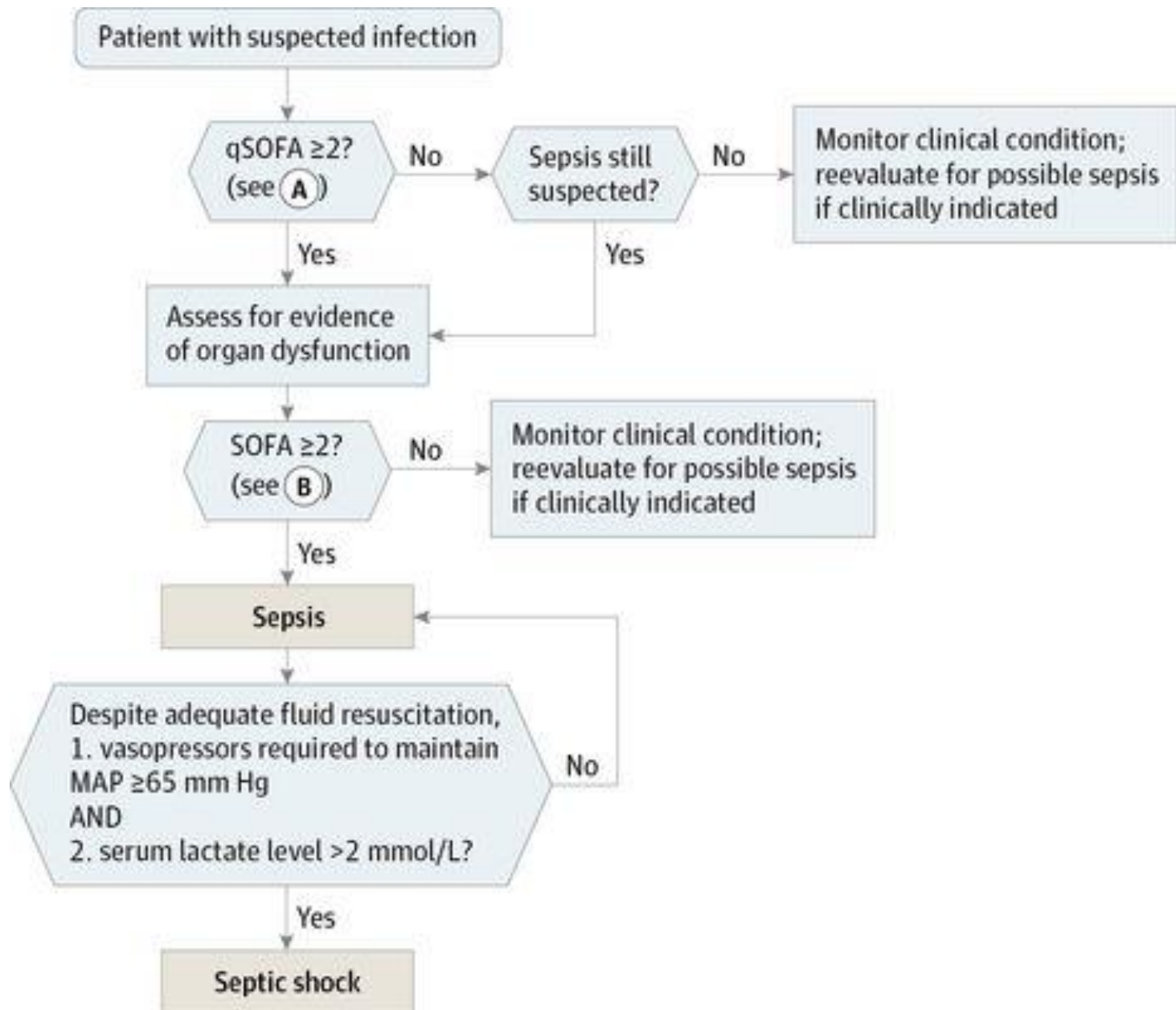


$\uparrow$ CREATININE,
OLIGURIA

SEPTIC SHOCK



IN THE ABSENCE OF HYPOVOLEMIA



A qSOFA Variables

- Respiratory rate
- Mental status
- Systolic blood pressure

B SOFA Variables

- PaO₂/FiO₂ ratio
- Glasgow Coma Scale score
- Mean arterial pressure
- Administration of vasopressors with type and dose rate of infusion
- Serum creatinine or urine output
- Bilirubin
- Platelet count



OLD WAY!



NEW WAY!



CALL SEPSIS ALERT! YOU HAVE 60 MINUTES!

- IVF's:
 - NS 30 mL/kg
- Antibiotics
 - At least 2
- Lactic acid
 - Now and in 3 hours
- Lab work
 - CBC, CMP, PTT/aPTT, UA
- Cultures
 - Blood, urine, sputum, CSF, Wound, etc (if needed)
- O2



NEW 'RED FLAG' SEPSIS CRITERIA



Check for **IMMEDIATE RED FLAGS**

Any **1** = Severe 'RED FLAG' Sepsis
Administer Sepsis Six in 60 minutes

Think **FABULOS**:

Fluid

Antibiotics

Blood Cultures

Urine Output

Lactate

Oxygen

in **S**ixty minutes

ANTIBIOTIC SELECTION FOR OSCEOLA REGIONAL MEDICAL CENTER		
Source	First-line	Penicillin allergy
Unknown Origin	Cefepime + Levofloxacin + Vancomycin	Aztreonam + Levofloxacin + Vancomycin
CAP – no pseudomonal risk*	Ceftriaxone + Azithromycin *	Levofloxacin*
CAP – pseudomonal risk* (eg. Structural lung disease)	Cefepime + Levofloxacin or Azithromycin*	Levofloxacin + Aztreonam*
HAP/VAP/HCAP	Cefepime + Vancomycin Optional: add Tobramycin	Levofloxacin + Tobramycin + Vancomycin (If renal impairment substitute Aztreonam for Tobramycin)
Skin & Soft Tissue Infection	Vancomycin + Piperacillin/Tazobactam (For necrotizing infection: add Clindamycin)	Vancomycin + Ciprofloxacin + Metronidazole
UTI – nursing home, healthcare-associated, or significant comorbidities**	Cefepime**	Tobramycin + levofloxacin**
UTI – community-acquired & no significant comorbidities **	Ceftriaxone**	Aztreonam + levofloxacin**
Febrile Neutropenia	Cefepime + Tobramycin ± Vancomycin Add Metronidazole if abdomen is suspected source	Aztreonam + Tobramycin ± Vancomycin
Intra-abdominal Infection	Cefepime + Metronidazole Or Piperacillin/Tazobactam	Levofloxacin + metronidazole
Meningitis – No predisposing risk factors	Dexamethasone (give 1 st) + Ceftriaxone + Vancomycin	Dexamethasone (give 1 st) + Aztreonam + Vancomycin
Meningitis – > 50 yrs or immunocompromised	Dexamethasone (give 1 st) + Ceftriaxone + Vancomycin + Ampicillin	Dexamethasone (give 1 st) + Trimethoprim/sulfamethoxazole + Aztreonam + Vancomycin



Which of the following, with laboratory evidence of HIV infection, constitutes AIDS?

- a. Esophageal candidiasis
- b. Invasive cervical cancer
- c. CNS Cryptococcus
- d. CMV retinitis
- e. All of the above



What is the most common opportunistic infection in patients with AIDS?

- a. Pneumocystis jiroveci (carinii) pneumonia
- b. Mycobacterium tuberculosis
- c. CMV retinitis
- d. CNS lymphoma
- e. Gonorrhea



HIV / AIDS

- Most common opportunistic infection
 - PCP pneumonitis (*Pneumocystis jirovecii*)
- CNS diseases
 - Toxoplasmosis
 - Lymphoma
 - Cryptococcus meningitis
- Lung disease
 - PCP, CAP, TB, *Mycobacterium avium*
- GI disease
 - Cryptosporidium
- Esophageal
 - Candidiasis
- Eye
 - CMV
- Skin
 - KS



Which of the following is the most common organism to cause cutaneous abscess?

- a. *B. fragilis*
- b. *P. mirabilis*
- c. MR - *S. aureus*
- d. *E. coli*
- e. Group B streptococci



SKIN ABSCESS

- Pilonidial, cutaneus, hydranitis suppurativa
- Most common cause
 - Staph, MRSA
- I+D
- Rx:
 - Sulfa/Trimep.
 - Clindamycin
 - Doxycycline
 - TCN
 - Vanco
 - Daptomycin



PHARYNGITIS

- First choice

- PCN
- Benzathine PCN
- Bicillin

- Second choice

- ESS, macrolides
- 1st or 2nd generation cephalosporin
- Clindamycin



OTITIS MEDIA

- First choice
 - Amoxicillin
- Second choice
 - Augmentin
 - Oral 2nd or 3rd generation cephalosporin
 - Trimethoprim / sulfamethoxazole
 - Macrolide



ACUTE EXACERBATION OF CHRONIC BRONCHITIS (AECB)

- First choice

- Macrolide
- Quinolones
- Augmentin

- Second choice

- TCN
- Oral 2nd or 3rd generation cephalosporin
- Trimethoprim / sulfamethoxazole



CAP

AMBULATORY PATIENTS

- First choice

- Macrolide
- TCN
- Quinolones

- Second choice

- Augmentin
- 2nd generation cephalosporin



CAP

AMBULATORY PATIENTS > 60 Y/O

- First choice
 - Quinolones
- Second choice
 - Augmentin



CAP

HOSPITALIZED PATIENTS

- First choice

- Ceftriaxone
- Beta-lactam / beta-lactamase inhibitor +/- macrolide
- Quinolones

- Second choice

- 2nd generation cephalosporin +/- macrolide
- Azithromycin



- Which of the following is the most common STD's in the USA?
 - a. Gonorrhea
 - b. Chlamydia
 - c. Syphilis
 - d. Trichomonas



URETHRITIS / CERVICITIS

■ First choice

- Azithromycin + ceftriaxone
- Doxycycline + ceftriaxone
- Azithromycin + cefixime or ciprofloxacin
- Amoxicillin + ceftriaxone or cefixime

■ Second choice

- Ofloxacin
- ESS + cefixime or ceftriaxone
- Ciprofloxacin + azithromycin or TCN or ESS



PID

OUTPATIENT

- First choice

- Ofloxacin or levofloxacin + metronidazole
- Ceftriaxone + doxycycline +/- metronidazole

- Second choice

- Azithromycin



PID

HOSPITALIZED PATIENT

- First choice

- Cefotetan or cefoxitin + doxycycline
- Clindamycin + gentamicin + doxycycline

- Second choice

- Ofloxacin + metronidazole
- Augmentin + doxycycline
- Ciprofloxacin + doxycycline + metronidazole
- Azithromycin + metronidazole



INTRA-ABDOMINAL INFECTION AND PERITONITIS

■ First choice

- Beta-lactam / beta-lactamase inhibitor +/- aminoglycoside
- Cefotetan or cefoxitin +/- aminoglycoside
- 3rd generation cephalosporin + metronidazole or clindamycin +/- aminoglycoside

■ Second choice

- Quinolone + metronidazole or clindamycin
- Carbapenem +/- aminoglycoside



ENDOCARDITIS

Native valves
IVDU

Non-IVDU

Prosthetic
valves

- **First choice**

- Nafcillin or oxacillin + gentamicin
- PCN or ampicillin + oxacillin or nafcillin + gentamicin
- Vanco + gentamicin + rifampin

- **Second choice**

- Vanco
- Vanco + gentamicin



The most common cause of erythema multiforme is:

- a. Streptococcal infections
- b. Exposure to drugs and HSV infection
- c. Viral infections
- d. Salicylates
- e. Tuberculosis



CELLULITIS

OUTPATIENTS

- First choice

- Dicloxacillin
- Augmentin

- Second choice

- Macrolide
- 1st generation cephalosporin



CELLULITIS

HOSPITALIZED PATIENTS

- First choice

- Nafcillin or oxacillin
- Carbapenem
- Beta-lactam / beta-lactamase inhibitor

- Second choice

- Macrolide
- 1st generation cephalosporin
- Quinolone + clindamycin or metronidazole



CELLULITIS

BITE WOUNDS

Mild

- First choice
 - Augmentin

- Second choice

- Quinolone + clindamycin or Trimethoprim/sulfamethoxazole

Severe

- Beta-lactam / beta-lactamase inhibitor

- Quinolone + clindamycin or Trimethoprim/sulfamethoxazole



CELLULITIS

DIABETIC FOOT

Mild infection

- First choice
 - 1st generation cephalosporin
 - Clindamycin

- Second choice
 - Augmentin

Severe

- Beta-lactam / beta-lactamase inhibitor
- Cefoxitin or cefotetan
- Quinolone + clindamycin or metronidazole

- Carbapenem
- Nafcillin or oxacillin + gentamicin + metronidazole



MENINGITIS

NEWBORNS

- First choice
 - Ampicillin + cefotaxime
- Second choice
 - Ampicillin + gentamicin



MENINGITIS

PATIENTS 2 M/O – 60 YRS

- First choice
 - Ceftriaxone or cefotaxime +/- vanco +/- rifampin
- Second choice
 - Meropenem +/- vanco



MENINGITIS

PATIENTS OLDER THAN 60 Y/O OR IMMUNE COMPROMISED

- First choice

- Ceftriaxone or cefotaxime
+/- vanco + ampicillin +/-
gentamicin

- Second choice

- Meropenem +/- vanco



MENINGITIS

PENICILLIN ALLERGIC

- First choice

- Chloramphenicol + vanco
+/- rifampin +
Trimethoprim/
sulfamethoxazole

- Second choice

- Aztreonam + vanco +
Trimethoprim/
sulfamethoxazole



UTI

- Uncomplicated infection (cystitis)
 - Trimethoprim/ sulfamethoxazole
 - Quinolone
 - 1st generation cephalosporin
 - Nitrofurantoin



UTI

- Pyelonephritis outpatient
 - Quinolone
 - Cephalosporin
 - Augmentin
 - Trimethoprim/ sulfamethoxazole



UTI

- Hospitalized patients
 - Ceftriaxone
 - Quinolone
 - Beta-lactam / beta-lactamase inhibitor +/- gentamicin
 - Carbapenem



UTI IN CHILDREN < 6 Y/O

- < 2 weeks
 - Ampicillin + gentamicin
- 2 weeks – 2 months
 - Ampicillin + cefotaxime
- > 2 months
 - Hospitalized
 - Cefotaxime or ceftriaxone
 - Oral regimens
 - Trimethoprim/ sulfamethoxazole
 - Cephalexin
 - Cefixime
 - Nitrofurantoin



SEPSIS SYNDROME

NEONATES

- First choice
 - Ampicillin + cefotaxime
- Second choice
 - Ampicillin + gentamicin



SEPSIS SYNDROME

- Children
 - 3rd generation cephalosporin



SEPSIS SYNDROME

ADULT

- First choice

- 3rd or 4th generation cephalosporin
- Beta-lactam / beta-lactamase inhibitor

- Second choice

- Carbapenem
- Vanco
- aztreonam



SEPSIS SYNDROME

NEUTROPENIC

- First choice

- Beta-lactam / beta-lactamase inhibitor + aminoglycoside +/- vanco

- Second choice

- Carbapenem
- 3rd or 4th generation cephalosporin + vanco
- PCN allergic: vanco + aminoglycoside +/- metronidazole



Which of the following is not appropriate ED treatment of a patient with tetanus?

- a. TIG administered at a site separate from the toxoid
- b. Autonomic instability requires monitoring and aggressive treatment
- c. Tobramycin 80 mg IV
- d. Tetanus toxoid
- e. Treat muscle spasms with benzodiazepines



Which of the following is not true regarding herpes zoster?

- a. May occur in anyone who has had varicella
- b. More common in the elderly and immunocompromised
- c. Target population for antiviral therapy includes older populations
- d. Topical antiviral therapies should be used routinely





**5 DAY OLD NEONATE WITH
DISCHARGE FROM EYES**

Dx and Tx?



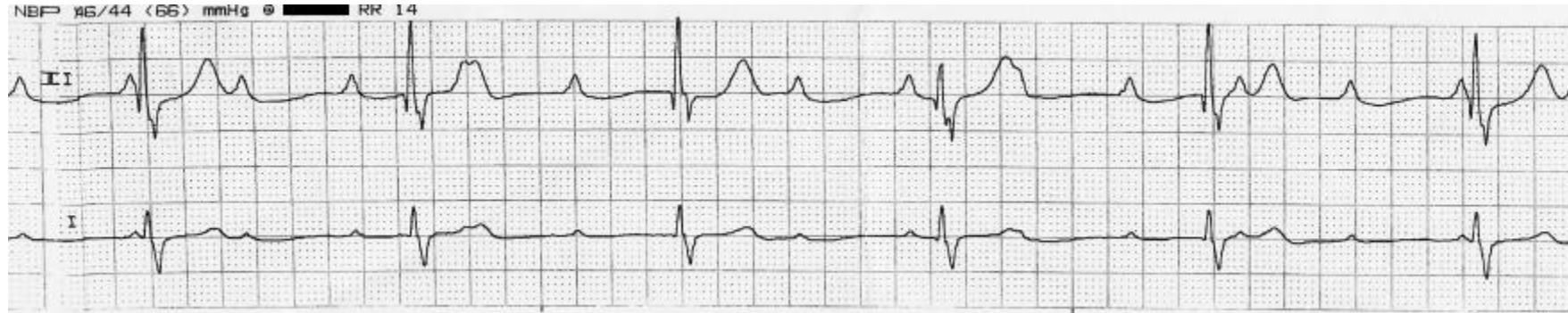
**5 DAY OLD NEONATE WITH
DISCHARGE FROM EYES**

Dx: Gonococcal conjunctivitis
Tx: Ceftriaxone x1

OPHTHALMIA NEONATORUM

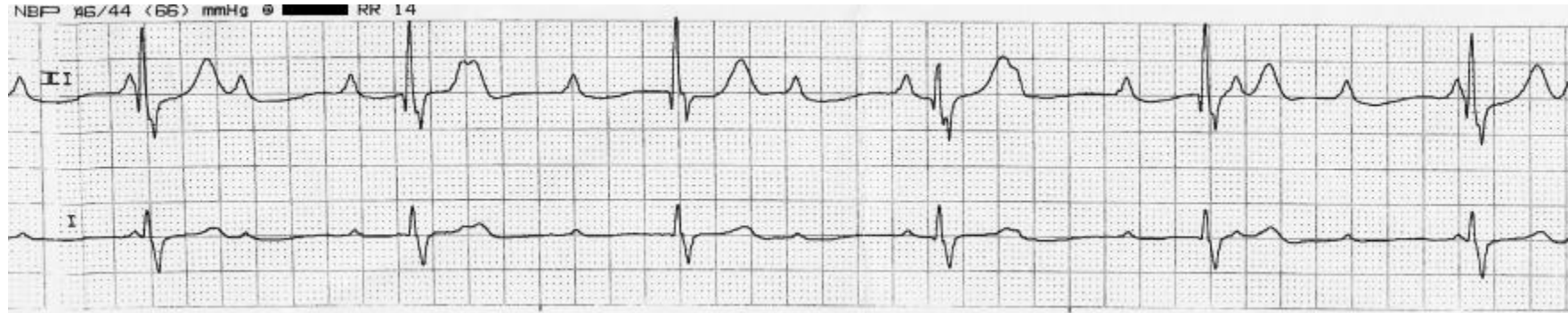
	Chemical	Gonococcal	Chlamydial
Time frame	First 24h	First 2-5 days	5 days – 2 weeks
SSx	Conjunctival injection, mild chemosis	Copious purulent discharge	Watery +/- bloody discharge
Diagnosis	Clinical	Discharge culture and Gram stain	Discharge culture and nucleic acid amplification
Treatment	Supportive, irrigate eyes, usu. lasts 24-36 hours	Ceftriaxone 25-50mg/kg IM x1 (alt: cefotaxime, ceftazidime)	Erythromycin PO x 14 days





**16 YO M WITH NEAR SYNCOPÉ,
RECENTLY AT SUMMER CAMP**

Dx and Tx?



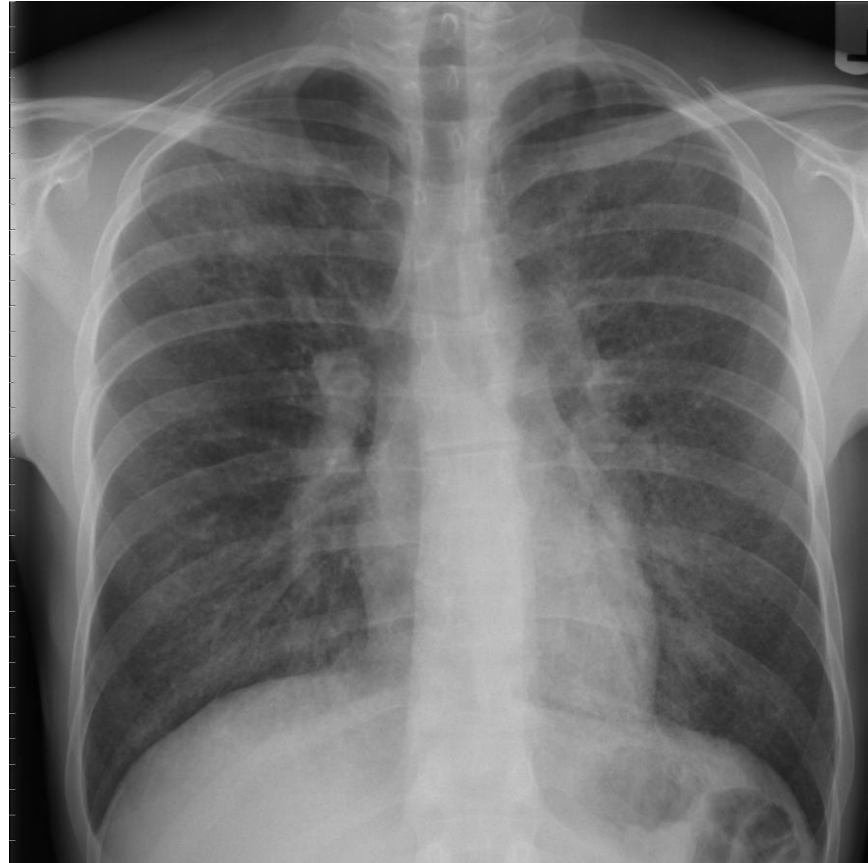
**16 YOM WITH NEAR SYNCOPE,
RECENTLY AT SUMMER CAMP**

Dx: Lyme carditis

Tx: Ceftriaxone

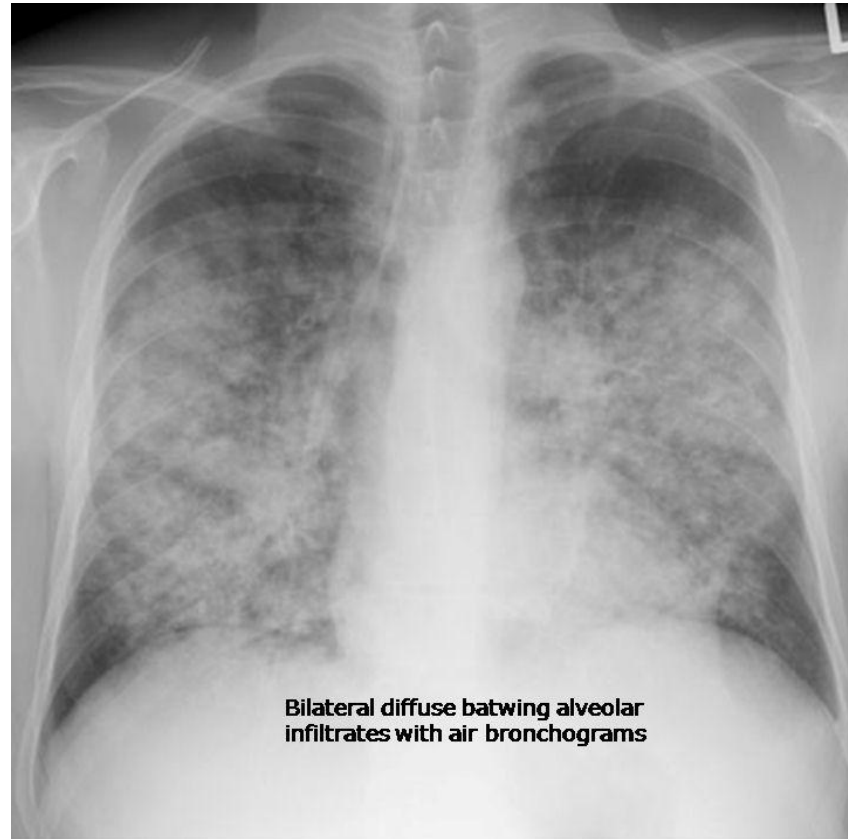
LYME DISEASE

<i>Borrelia burgdorferi</i> , transmitted by <i>Ixodes</i> tick		
Early localized	Early disseminated	Late disseminated
Erythema migrans (classic “bull’s eye” rash) 	Carditis (e.g. heart block), neurologic symptoms (e.g. meningo-encephalitis, bilateral Bell’s palsy), liver/kidney disease, conjunctivitis	Intermittent mono- or oligoarticular arthritis (usu. knees)
Time course: Days to weeks	Time course: Weeks to months	Time course: Months to years
Tx: doxycycline, alt. amoxicillin	Tx: ceftriaxone IV	Tx: ceftriaxone IV



**47 YO M WITH HIV P/W
DYSPNEA AND SAO2 74%**

Dx and Tx?



Bilateral diffuse batwing alveolar infiltrates with air bronchograms

**47 YOM WITH HIV P/W DYSPNEA
AND SAO₂ 74%**

Dx: PJP
Tx: TMP-SMX

OPPORTUNISTIC INFECTIONS IN AIDS

CD4 count	Opportunistic Diseases
<500	Tuberculosis, HSV, Zoster, Kaposi sarcoma
<200	PJP, HIV encephalopathy, candidiasis, PML
<100	Fungi and protozoans: toxo, histo, crypto
<50	CNS lymphoma, CMV retinitis/gastritis/pneumonitis
Note: AIDS patients get all the usual stuff too, so don't forget about run-of-the-mill Strep or influenza.	



47 YO GOVERNMENT EMPLOYEE WITH SOB AND FLU-LIKE SYMPTOMS 1 WEEK AFTER OFFICE EXPLOSION

Possible causes?

Next steps?



47 YO GOVERNMENT EMPLOYEE WITH SOB AND FLU-LIKE SYMPTOMS 1 WEEK AFTER OFFICE EXPLOSION

Possible causes?

Anthrax, pneumonic plague, smallpox

Next steps?

Isolation, early abx



BIOLOGICAL WARFARE

Cause	Symptoms	Treatment
Anthrax (<i>Bacillus anthracis</i>)	ILI followed by rapid sepsis, hemorrhagic mediastinitis, shock	Ciprofloxacin; pulmonary anthrax has 50-90% mortality
Plague (<i>Yersinia pestis</i>)	ILI followed by fulminant pna, DIC, and septic shock	Streptomycin, gentamicin, or cipro; near 100% mortality if not treated early
Smallpox	ILI followed by head-to-body pox rash; 10% can have hemorrhagic form causing petechiae	No treatment, isolate patient ASAP; hemorrhagic form has 90% mortality



16 MO MALE WITH TEMP 40°C AND SEIZURE FOLLOWED BY RASH

Name the viral exanthem.

Management?



16 MO MALE WITH TEMP 40°C AND SEIZURE FOLLOWED BY RASH

Viral Exanthem:
Roseola

Management?
Supportive



CHILDHOOD EXANTHEMS

Disease	Features
Measles (rubeola)	Blanching “brick red” rash spreading from head -> trunk -> limbs; cough + conjunctivitis + coryza
Varicella (chickenpox)	Crusting vesicles in different stages of healing
Rubella	Measles-like rash in a well-appearing kid; +posterior/occipital lymph nodes, palatal petechiae
Erythema infectiosum (fifth disease)	“Slapped cheeks” -> reticular rash spreading from arms to body
Roseola	High fever x3-5 days +/- seizures, then rash from trunk -> limbs (spares the face)



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Watery diarrhea, ate at a picnic	???
Watery diarrhea, ate reheated rice	???
Watery diarrhea, traveled to Mexico	???



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Watery diarrhea, ate at a picnic	<i>S. aureus</i> (toxin)
Watery diarrhea, ate reheated rice	<i>B. cereus</i> (toxin)
Watery diarrhea, traveled to Mexico	ETEC (toxin)



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Watery diarrhea, ate tuna steak, +rash	???
Watery diarrhea, ate undercooked beef	???
Watery diarrhea, neuro ssx, ate barracuda	???



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Watery diarrhea, ate tuna steak, +rash	Scombroid (2/2 histadine)
Watery diarrhea, ate undercooked beef	C. perfringans (toxin)
Watery diarrhea, neuro ssx, ate barracuda	Ciguatera (toxin)



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Bloody diarrhea, ate undercooked eggs, relative bradycardia	???
Bloody diarrhea, high fever, seizure	???
Bloody diarrhea followed by weakness	???



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Bloody diarrhea, ate undercooked eggs, relative bradycardia	Salmonella (invasive)
Bloody diarrhea, high fever, seizure	Shigella (invasive)
Bloody diarrhea followed by weakness	Campylobacter (invasive) +GBS



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Bloody diarrhea, RLQ pain, contact w/ farm animals	???
Bloody diarrhea, ate raw seafood	???
Bloody diarrhea, ate rare ground beef	???



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Bloody diarrhea, RLQ pain, contact w/ farm animals	Yersinia
Bloody diarrhea, ate raw seafood	Vibrio parahaemolyticus
Bloody diarrhea, ate rare ground beef	E. coli O157:H7



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Profuse diarrhea +abd pain, recent abx	???
Diarrhea, AKI, low platelets	???
Rice-water diarrhea, communal water	???



DIARRHEA: HERE WE GO AGAIN

Buzz	Bug
Profuse diarrhea +abd pain, recent abx	<i>C. difficile</i>
Diarrhea, AKI, low platelets	HUS/TTP (assoc. w/ <i>E. coli</i> O157:H7)
Rice-water diarrhea, communal water	<i>Vibrio cholerae</i> (toxin)

