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SOCIETÀ ITALIANA MEDICINA D'EMERGENZA-URGENZA
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Antibiotici in Pronto Soccorso

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XIII congresso nazionale
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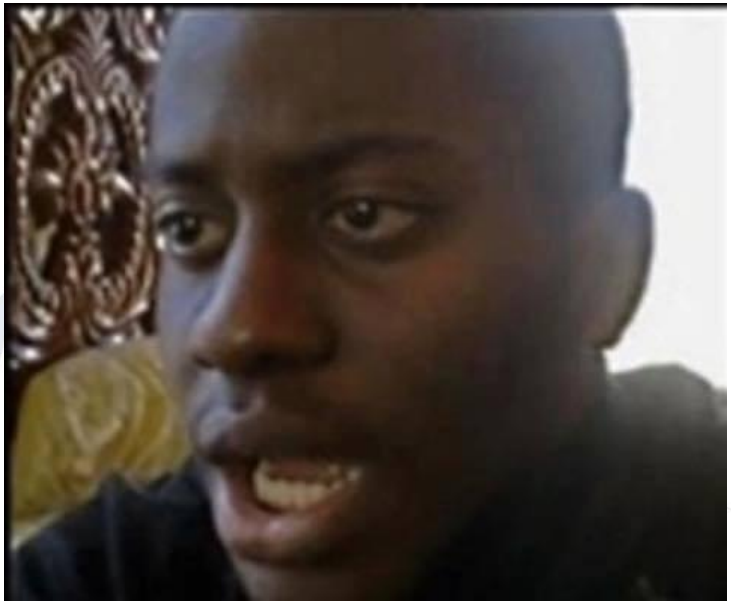
Faculty Sepsi SIMEU



Emergency Medicine Clinics of North America
Volume 36, Issue 4, November 2018, Pages 853-872

Antimicrobial Stewardship in the Emergency Department

INDICATIONS

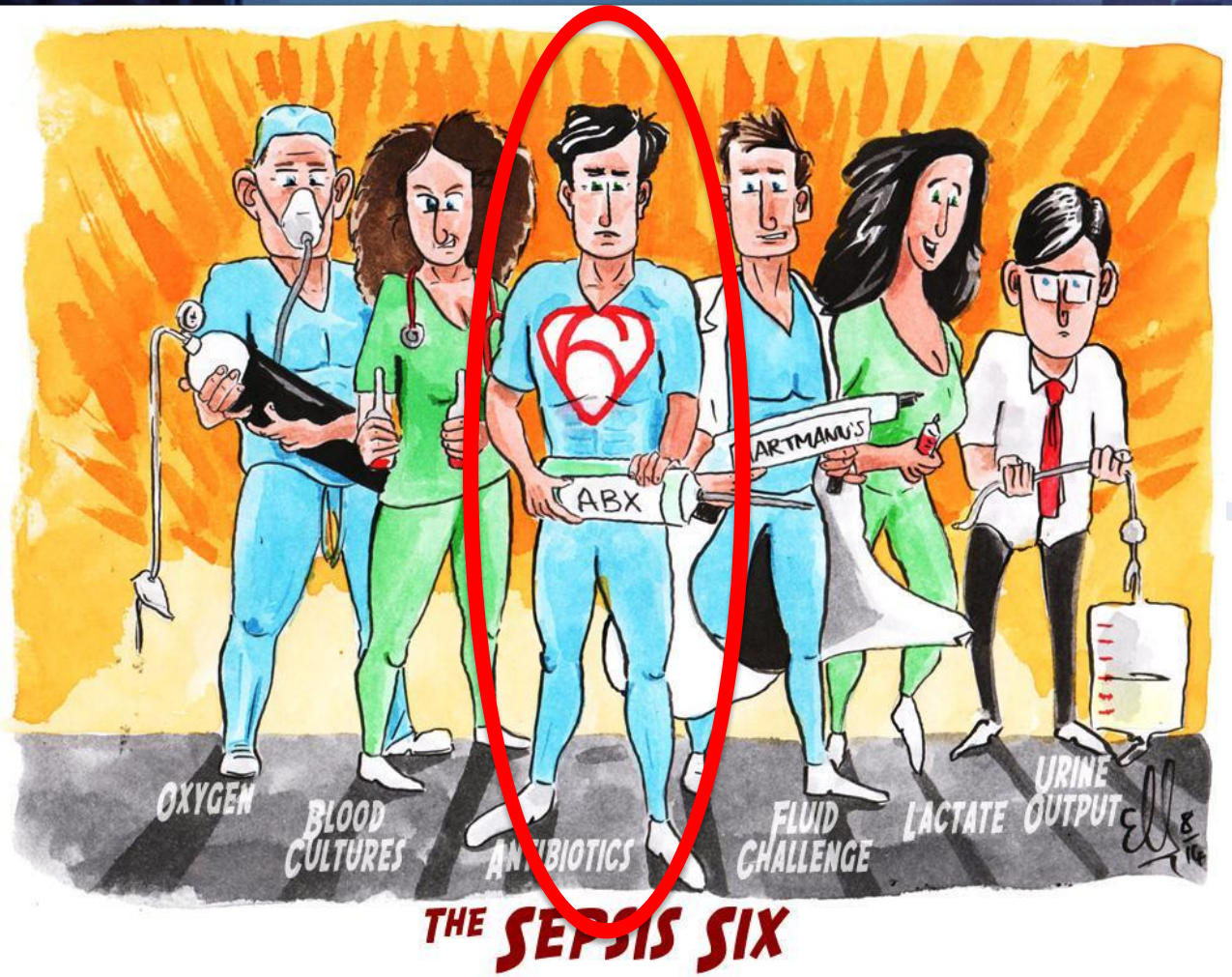
- Sepsis / Septic shock 
- Meningitis
- Necrotizing Fascitis
- Open fracture

SEPSIS AND SEPTIC SHOCK

Sepsis	Septic shock
wide range of infections.	mortality than sepsis alone.

Sepsis and septic shock are medical emergencies

Singer M *et al. JAMA*. 2016; 315:801-810.



Sepsis six

Seymour CW et al. *N Engl J Med* 2017;376:2235-44.

ANTIMICROBIAL TREATMENT

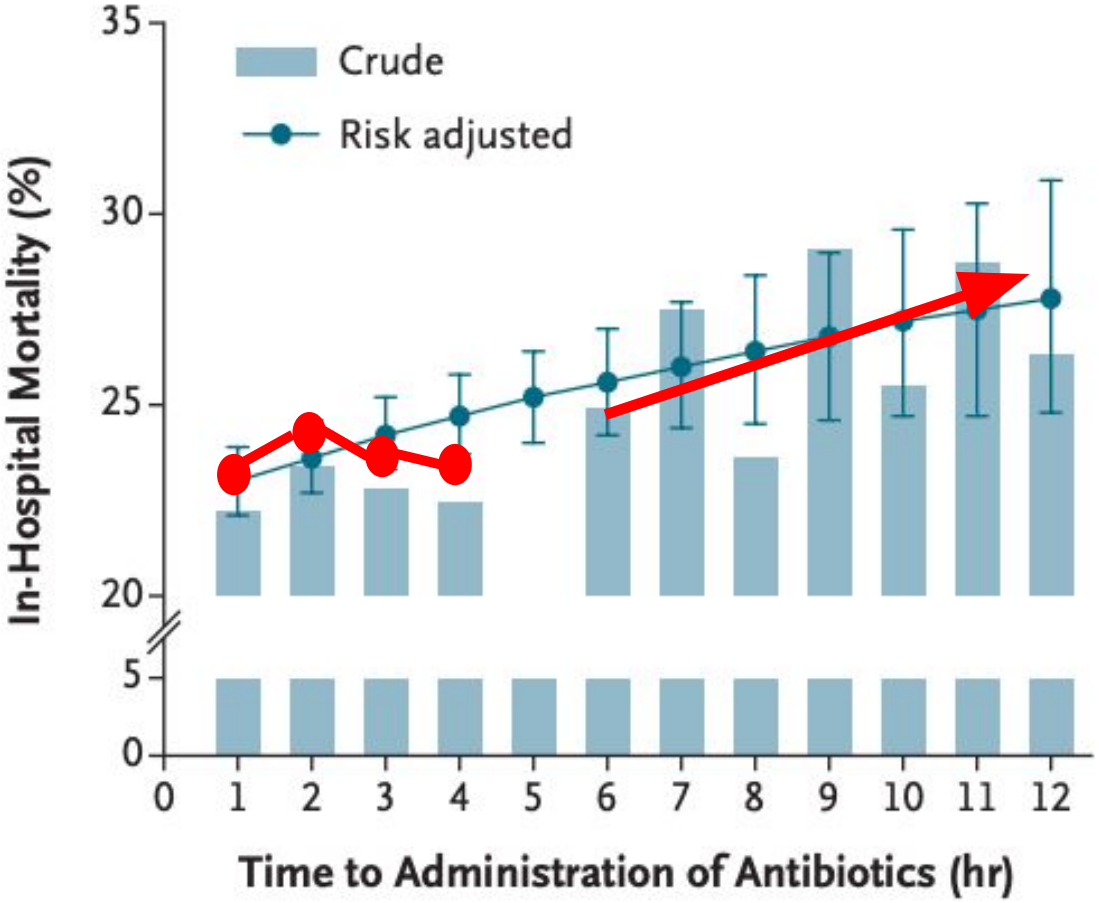
For adults with possible septic shock or a high likelihood for sepsis, we recommend administering antimicrobials immediately, ideally within 1 h of recognition.

Strong recommendation, low quality of evidence (Septic shock)

Strong recommendation, very low quality of evidence (Sepsis without shock)

EMPIRIC BROAD SPECTRUM THERAPY

Evans L *et al.* Surviving Sepsis Campaign. *Intensive Care Med* 2021*; 47: 1181-1247*



Seymour *et al. N Engl J Med.* 2017; 376:2235-2244.

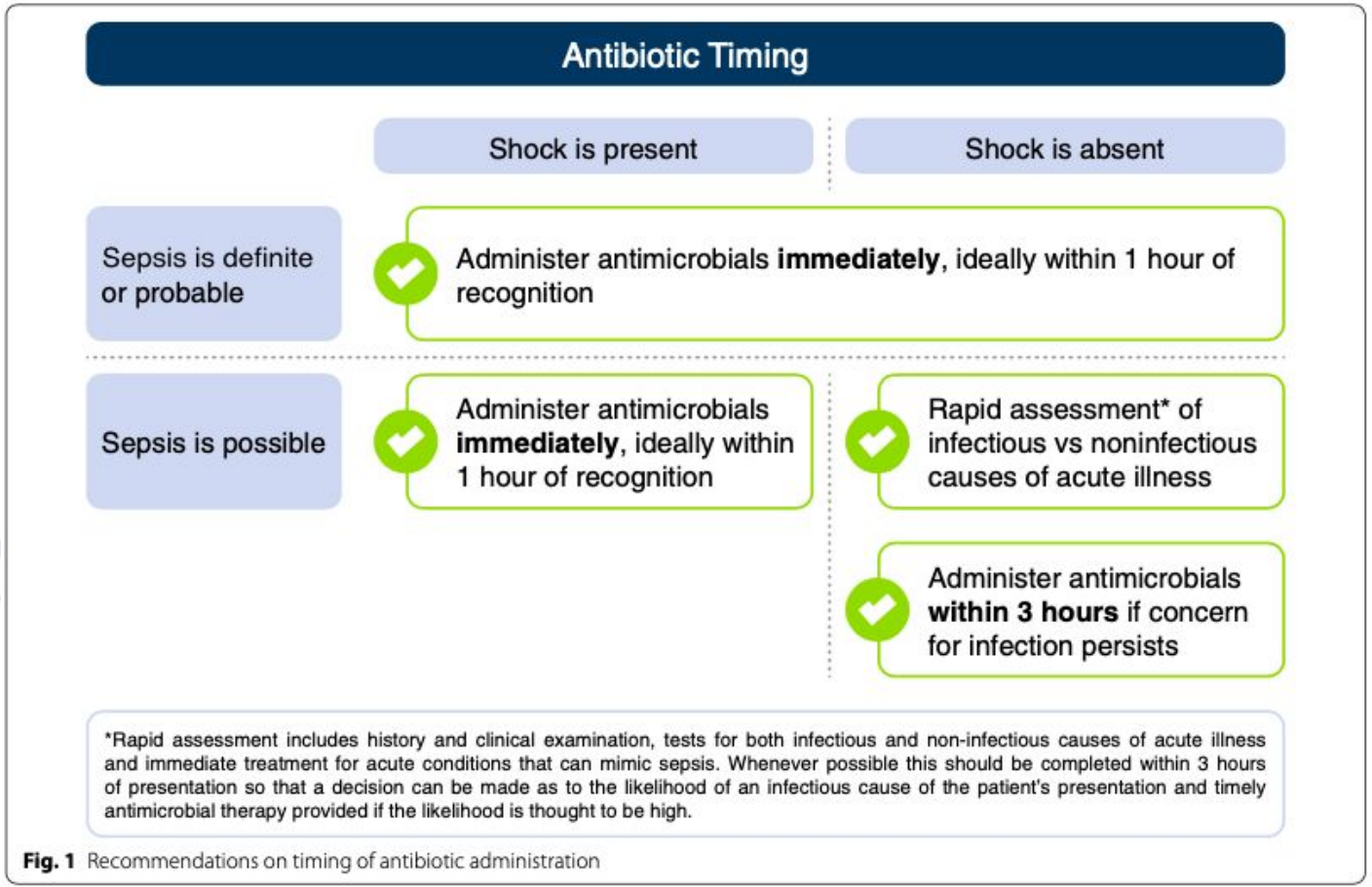
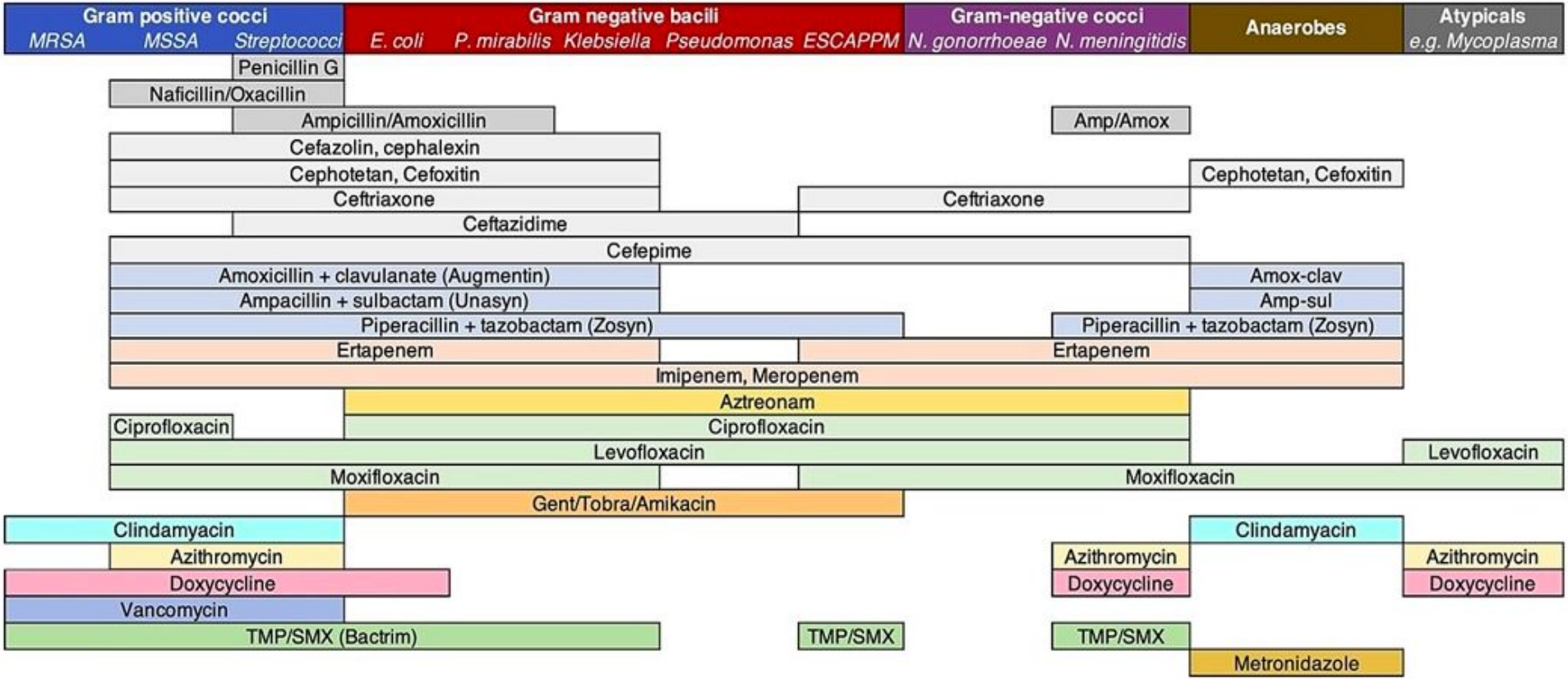


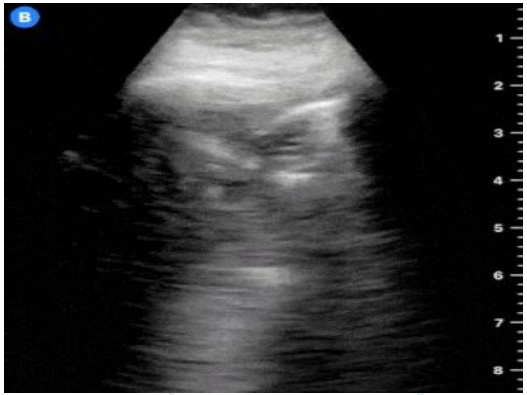
Fig. 1 Recommendations on timing of antibiotic administration

Evans L *et al.* Surviving Sepsis Campaign. *Intensive Care Med* 2021*; 47: 1181-1247*

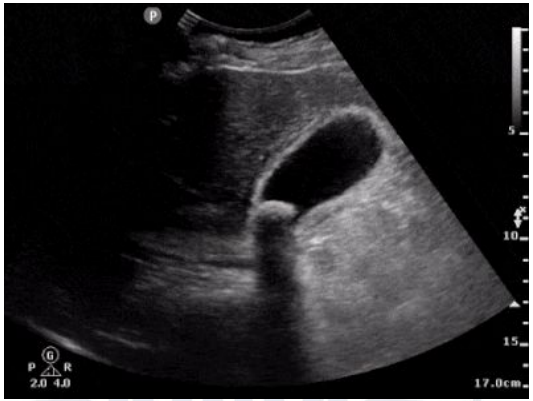


Guarino M *et al. J Clin Med*. 2023; 12: 3188.

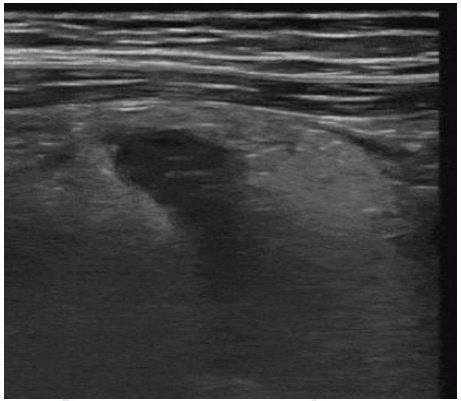
FOCUS



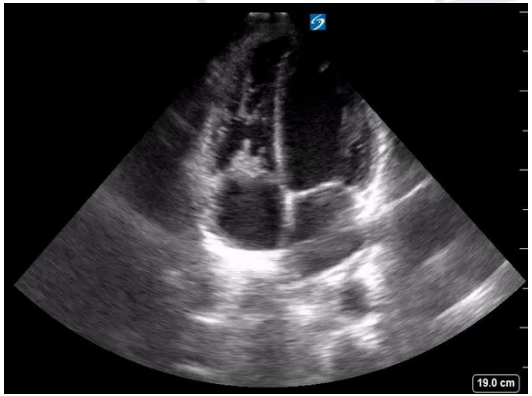
Pneumoniae



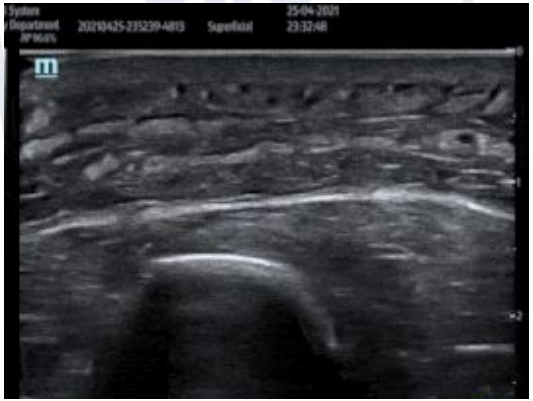
Cholecystitis with gallstone



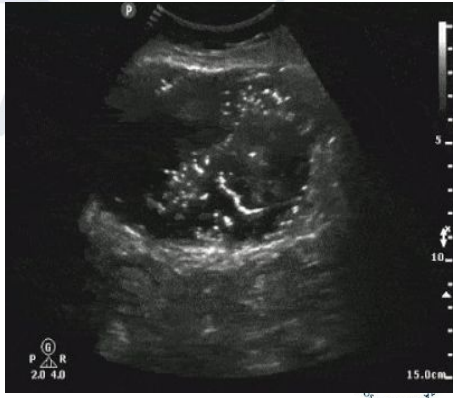
Appendicitis



Endocarditis

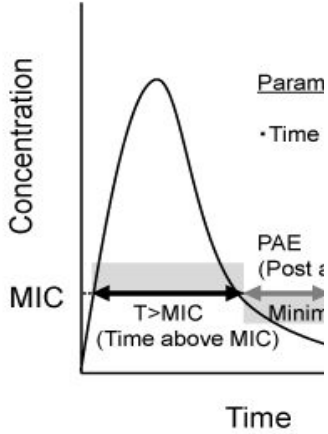


Cellulitis

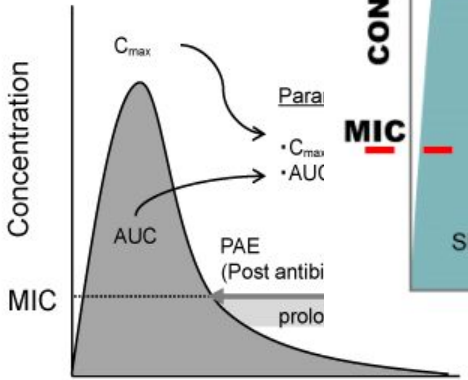


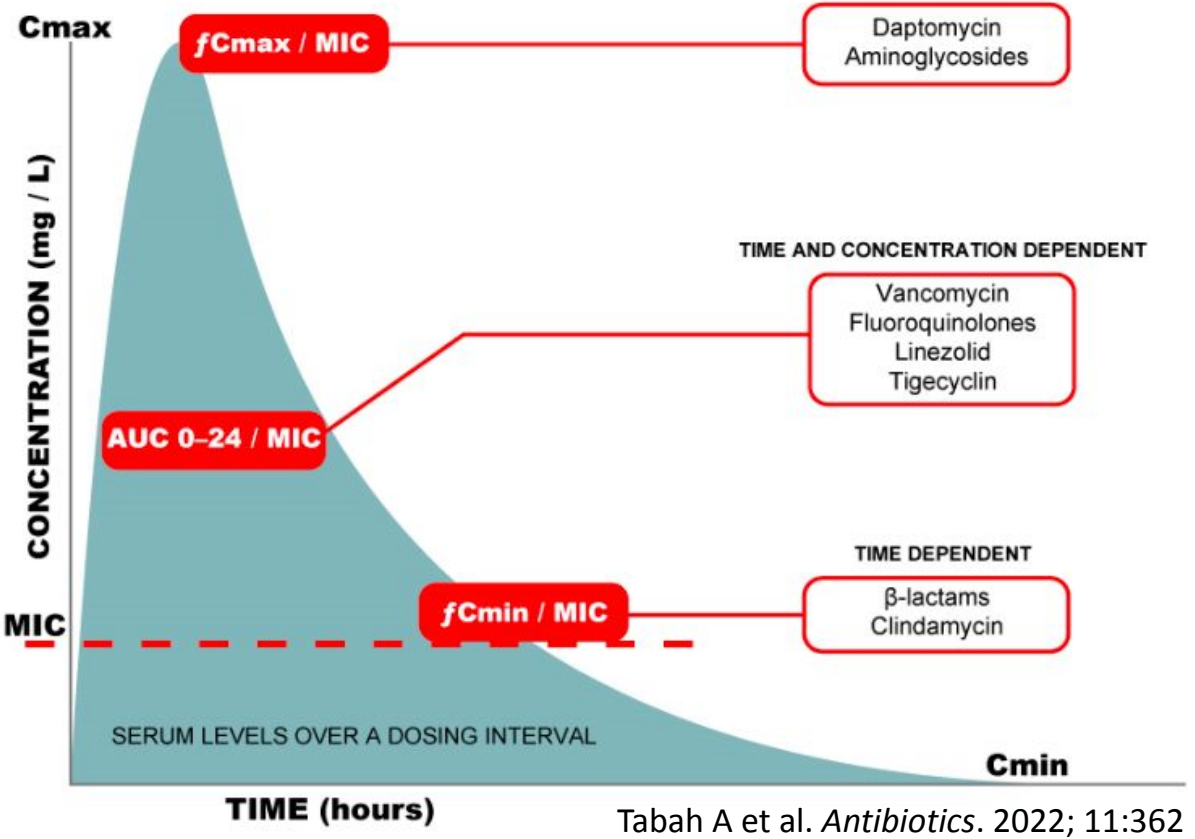
Abscess

Time-dependent antibiotics



Concentration-depen





Antibiotic Class - *Antibiotic*	Killing Characteristic	Pharmacodynamic Parameter*
Daptomycin Aminoglycosides	CONCENTRATION DEPENDENT	ım-negatives) al activity, Gram-negatives) tericidal activity, Gram-negatives) al activity, Gram-negatives)
Vancomycin Fluoroquinolones Linezolid Tigecyclin	TIME AND CONCENTRATION DEPENDENT	negatives) ram-positives) -negatives) (Gram-positives)
β-lactams Clindamycin	TIME DEPENDENT	*hylococcus aureus*) *coccus* spp.) *ides fragilis*) *taphylococcus aureus*)

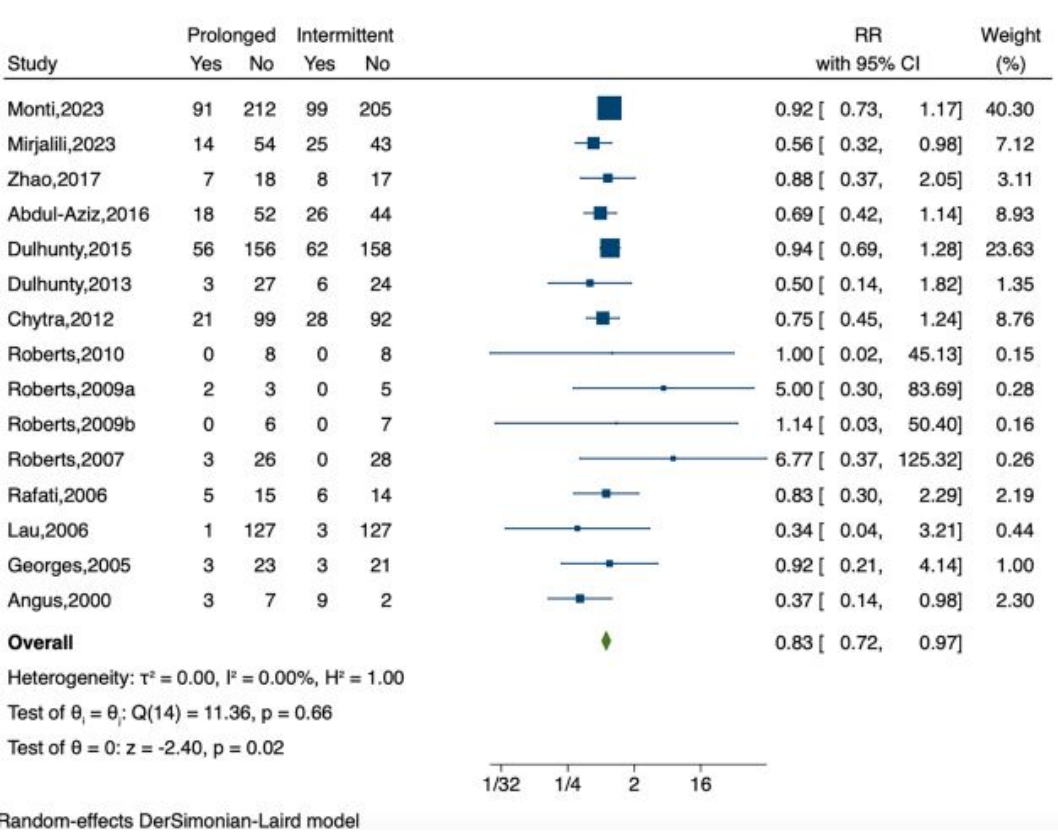
* Exposures are total drug unless otherwise noted

Tabah A et al. *Antibiotics*. 2022; 11:362

Fujii M et al. *Expert Opin Drug Metab Toxicol*. 2020; 16:415-430.

REVIEW Open Access

Prolonged versus intermittent β-lactam infusion in sepsis: a systematic review and meta-analysis of randomized controlled trials



The study demonstrated a statistically significant reduction in all-cause mortality with prolonged infusion compared to intermittent infusion (RR, 0.83; 95% CI 0.72–0.97; P=0.02).

The use of a loading dose for prolonged β-lactam infusion resulted in a significant reduction in mortality (RR, 0.84; 95% CI 0.72–0.97; P=0.02).

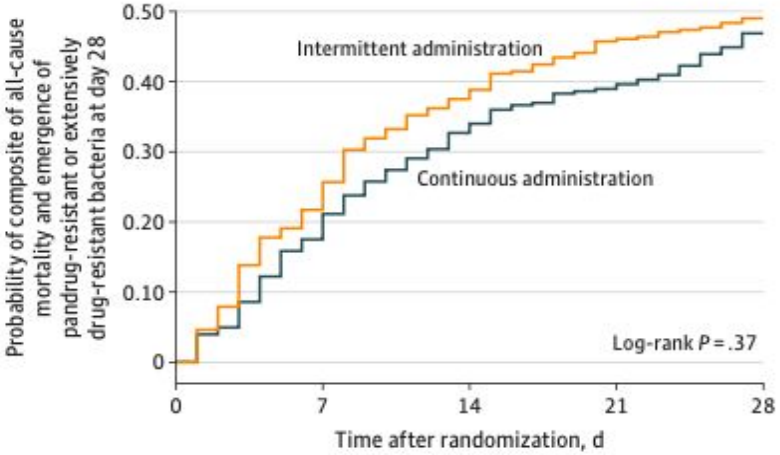
Zhao Y et al. *Ann Intensive Care*. 2024; 14:30

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

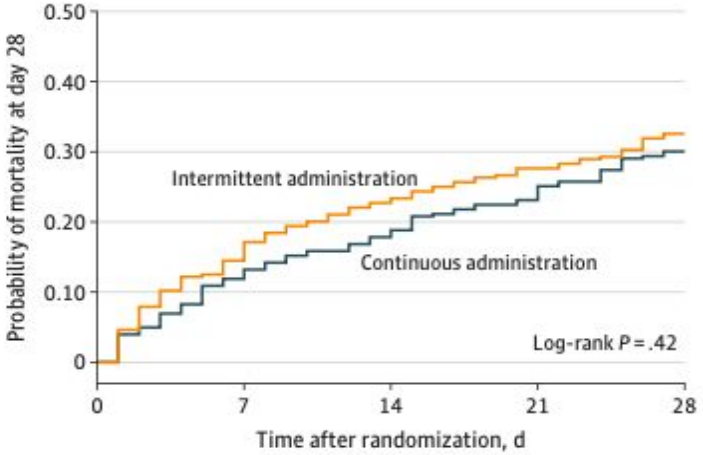
Continuous vs Intermittent Meropenem Administration in Critically Ill Patients With Sepsis

The MERCY Randomized Clinical Trial

A Composite primary outcome



B Secondary outcome



No. at risk

Continuous administration	303	250	204	185	161	303	267	249	233	212
Intermittent administration	304	238	190	165	155	304	260	235	220	205

CONCLUSIONS AND RELEVANCE In critically ill patients with sepsis, compared with intermittent administration, the continuous administration of meropenem did not improve the composite outcome of mortality and emergence of pandrug-resistant or extensively drug-resistant bacteria at day 28.

ANTIMICROBIAL TREATMENT DURATION

Duration of antibiotics

Recommendation
30. For adults with an initial diagnosis of sepsis or septic shock and adequate source control, we **suggest** using shorter over longer duration of antimicrobial therapy *Weak recommendation, very low quality of evidence*

DSA Diseases Society of America hivma hiv medicine association OXFORD

Antimicrobial Treatmen
Infections

Lindsay M. Busch and Sameer S. Kadri

Biomarkers to discontinue antibiotics

Recommendation
31. For adults with an initial diagnosis of sepsis or septic shock and adequate source control where optimal duration of therapy is unclear, we **suggest** using procalcitonin AND clinical evaluation to decide when to discontinue antimicrobials over clinical evaluation alone *Weak recommendation, low quality of evidence*

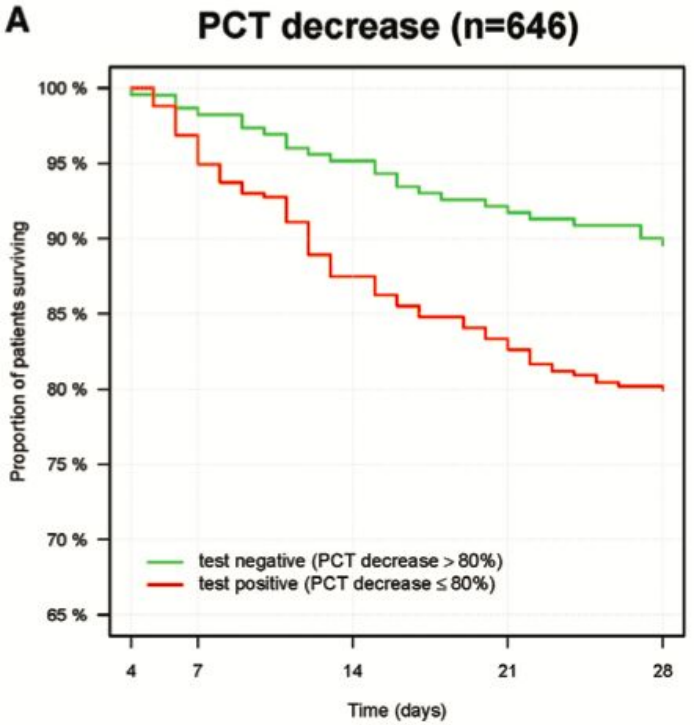
Busch LM et al. J Infect Dis. 2020;222(Suppl 2):S142-S155.

PROCALCITONIN

Serial Procalcitonin Predicts Mortality in Severe Sepsis Patients: Results From the Multicenter Procalcitonin MOnitoring SEpsis (MOSES) Study

Philipp Schuetz, MD, MPH[1]; Robert Birkhahn, MD[2]; Robert Sherwin, MD[3]; Alan E. Jones, MD[4]; Adam Singer, MD[5]; Jeffrey A. Kline, MD[6]; Michael S. Runyon, MD, MPH[6]; Wesley H. Self, MD[7]; D. Mark Courtney, MD[8]; Richard M. Nowak, MD[9]; David F. Gaieski, MD[10]; Stefan Ebmeyer, MD[11]; Sascha Johannes, PhD[11]; Jan C. Wiemer, PhD[11]; Andrej Schwabe, PhD[11]; Nathan I. Shapiro, MD, MPH[12]

Reduction to less than 80% of basal PCT at day 4 significantly reduces 28-day mortality



ANTIMICROBIAL DE-ESCALATION

Clinical Infectious Diseases

REVIEW ARTICLE

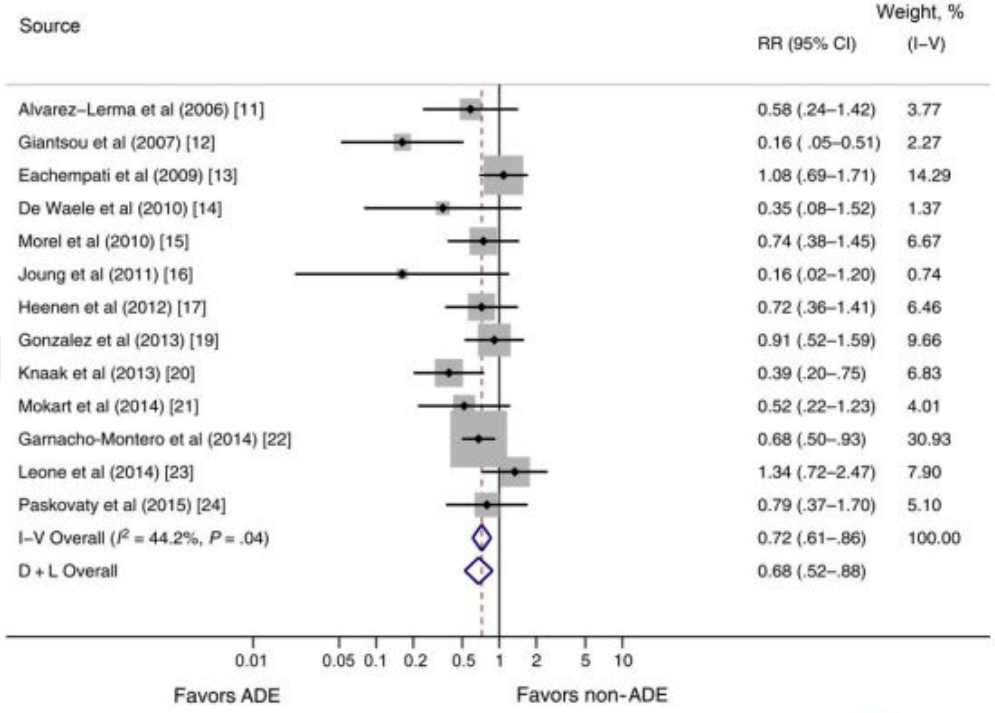
A Systematic Review of the Definitions, Determinants, and Clinical Outcomes of Antimicrobial De-escalation in the Intensive Care Unit

Alexis Tabah,[1,2,a] Menino Osbert Cotta,[1,2,3,a] Jose Garnacho-Montero,[4] Jeroen Schouten,[7] Jason A. Roberts,[1,2,3] Jeffrey Lipman,[1,2,6] Mark Tacey,[5] Jean-François Timsit,[8,9] Marc Leone,[10] Jean Ralph Zahar,[11] and Jan J. De Waele[12]; for the Working Group for Antimicrobial Use in the ICU

Table 3. Factors Associated With Antimicrobial De-escalation

Factors Associated With ADE
Positively associated
Initially appropriate empiric antimicrobial therapy
Broad-spectrum empiric therapy
Compliance with national prescribing guidelines
Treatment with multiple and "companion" antimicrobials
Positive microbiological cultures
Lower severity of illness scores at
Baseline
Time of ADE
Day 5 of therapy
Negatively associated
Isolation of a multiresistant pathogen
Polymicrobial infections
Intra-abdominal infections

Abbreviation: ADE, antimicrobial de-escalation.



Tabah A. Clin Infect Dis. 2016; 62:1009-1017.

INDICATIONS

- Sepsis / Septic shock
- Meningitis
- Necrotizing Fascitis
- Open fracture

MENINGITIS

ESCMID guideline: diagnosis and treatment of acute bacterial meningitis

ANTIMICROBIAL AGENTS: BACTERIAL/FUNGAL: EDITED BY MONICA A. SLAVIN

Dose optimisation of antibiotics used for meningitis

Heffernan, Aaron J.[a,b]; Roberts, Jason A.[a,c,d]

<50 years	Ceftriaxone 2 g/die + Acyclovir 10 mg/kg/tid
>50 years	Ceftriaxone 2 g/die + Ampicillin 12 g/die ± Acyclovir 10 mg/kg/tid

van de Beek D et al. Clin Microbiol Infect. 2016;22 Suppl 3:S37-62.

INDICATIONS

- Sepsis / Septic shock
- Meningitis
- Necrotizing Fascitis
- Open fracture

NECROTIZING FASCITIS

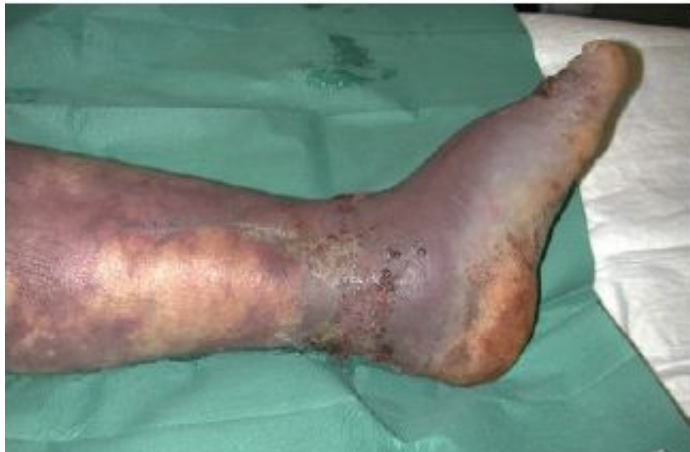
Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America

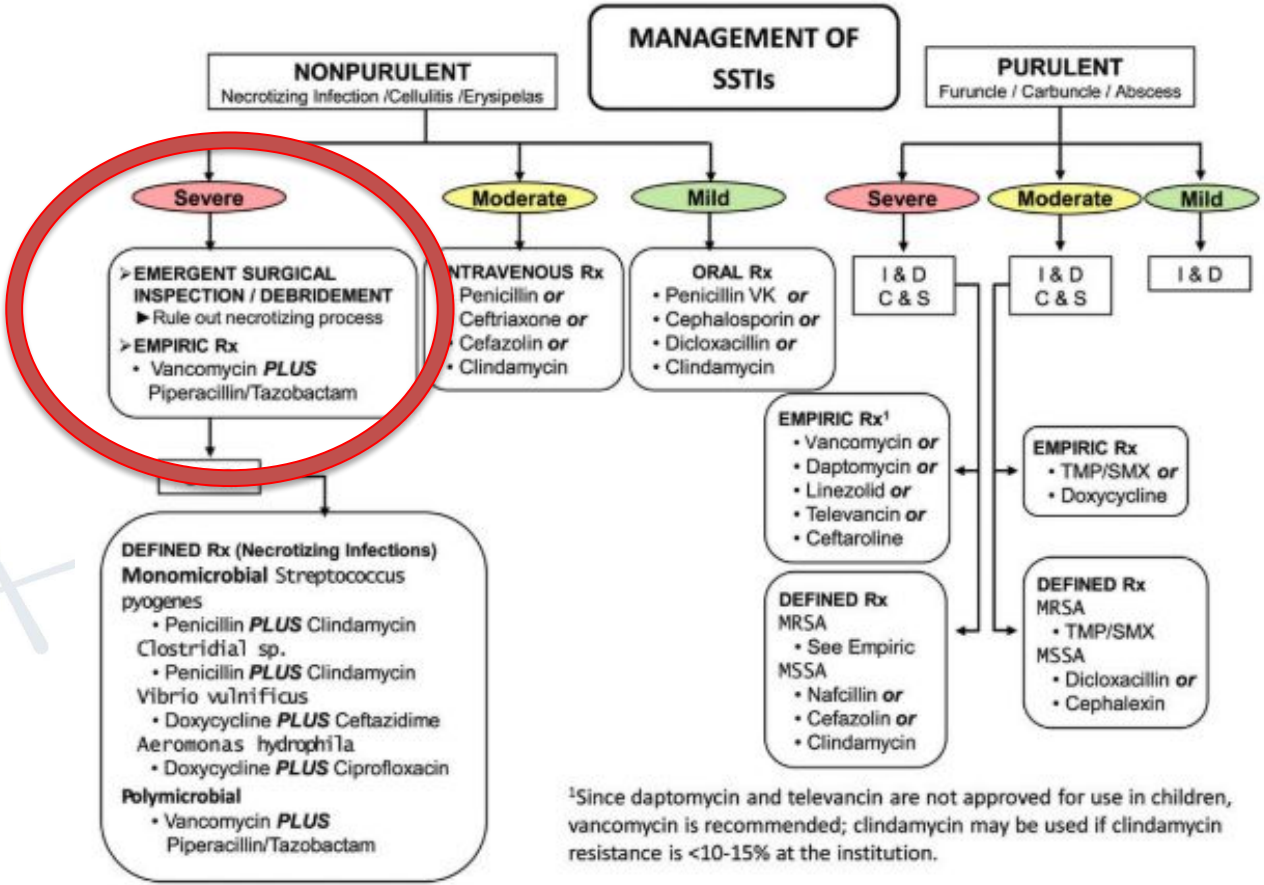
Table 1 The Laboratory Risk Indicator for Necrotising Fasciitis

Parameter	Range	Score[a]
Hb (g/dl)	>13.5	0
	11–13.5	1
	<11	2
White cells (10^9/L)	<15	0
	15–25	1
	>25	2
Sodium (mmol/L)	<135	2
Creatinine (μmol/L)	>141	2
Glucose	>10	1
C-reactive protein	>150	4

[a]Score ≤5 = <50% risk (low); 6–7 = intermediate risk; ≥8 = >75% risk (high).

LRINEC score





Stevens DL et al. Clin Infect Dis. 2014; 59:e10-52.

INDICATIONS

- Sepsis / Septic shock
- Meningitis
- Necrotizing Fascitis
- Open fractures

OPEN FRACTURES

Review Article

Antibiotic Prophylaxis in Open Fractures: Evidence, Evolving Issues, and Recommendations

Table 1

Gustilo-Anderson Classification of Open Fractures[1,2]

Type	Details
I	Open fracture with a wound less than 1 cm long, low energy, without gross contamination
II	Open fracture with a wound 1–10 cm long, low energy, without gross contamination or extensive soft-tissue damage, flaps, or avulsions
III	A: Open fracture with a wound greater than 10 cm with adequate soft-tissue coverage, or any open fracture due to high-energy trauma or with gross contamination, regardless of the size of the wound B: Open fracture with extensive soft-tissue injury or loss, with periosteal stripping and bone exposure that requires soft-tissue coverage in the form of muscle rotation or transfer C: Open fracture associated with arterial injury requiring repair

The Eastern Association for the Surgery of Trauma recommends **coverage for gram-positive bacteria** with systemic antibiotics **at the time of presentation for patients with an open fracture**. **Gram-negative coverage should be added for type III open fractures**, and high-dose penicillin should be added for barnyard injuries.

Garner MR et al. J Am Acad Orthop Surg. 2020;28:309-315.

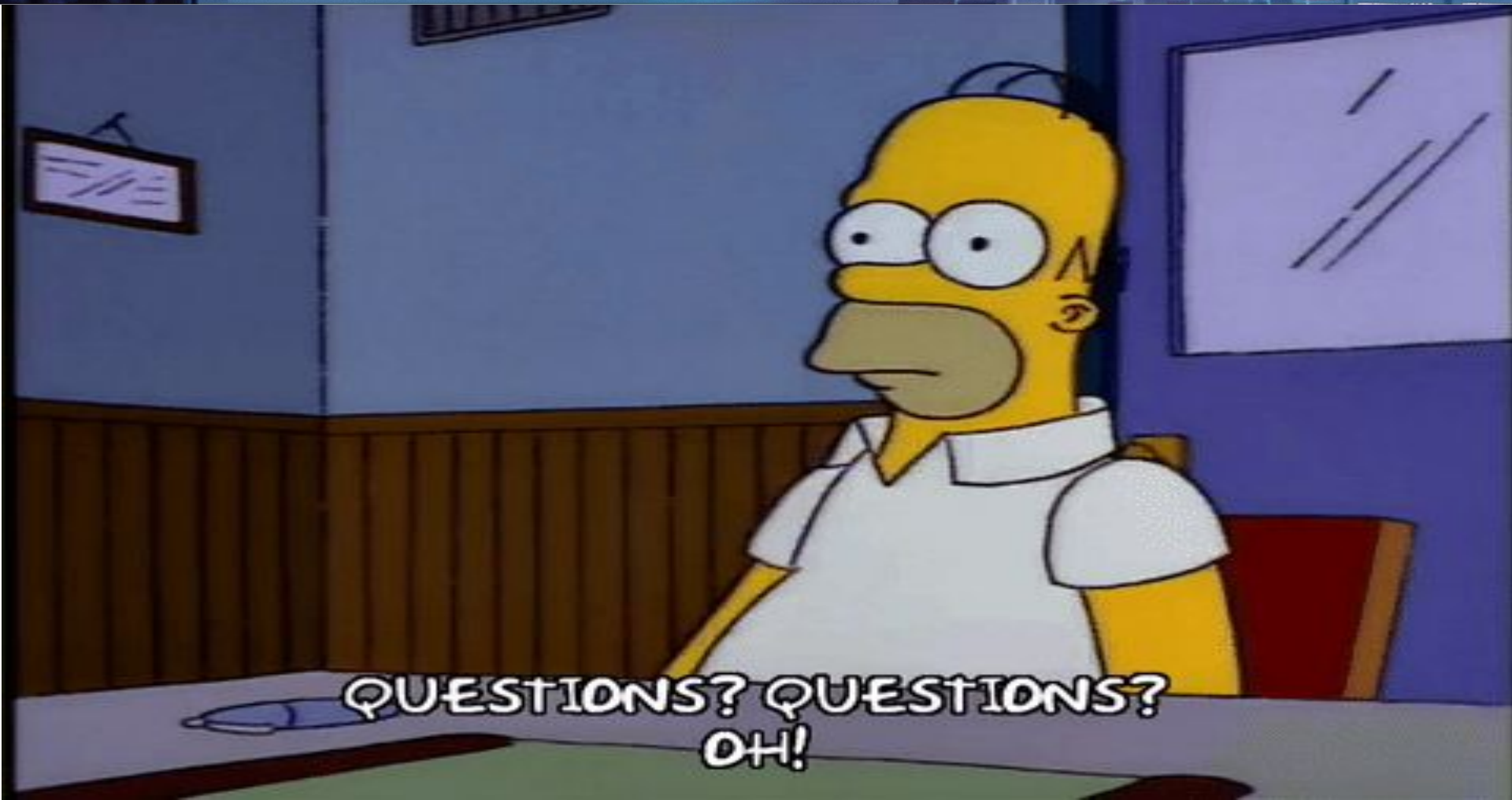
HOME TREATMENTS

Type of Infection	First Line Treatment	Allergies to Penicillin
CAP	Amoxicillin/Clavulanate 1 g tid + Clarithromycin 500 mg bid	Levofloxacin 750 mg od
Uncomplicated UTIs	Trimethoprim / Sulphamethoxazole 160+800 mg bid	
Pyelonephritis	Ceftriaxone 2 g followed by Trimethoprim / Sulphamethoxazole 160+800 mg bid	
Abdominal Infections	Amoxicillin/Clavulanate 1 g tid	
Soft Tissue Infections	Amoxicillin/Clavulanate 1 g tid ± Clindamycin 600 mg qid	

CONCLUSIONS

- Antimicrobial management is a life-saving treatment.
- It should be firstly performed with empiric broad-spectrum regimens based on local epidemiology.
- Short course a preferred to long ones (no changes in mortality).
- The team-work with other specialists should be always considered.

stop sepsis save lives


QUESTIONS? QUESTIONS?
OH!