Infections of the Spine

John Lynch, MD, MPH
UW Medicine | Harborview Medical Center
jblynch@uw.edu

February 13, 2018

This presentation is intended for educational use only, and does not in any way constitute medical consultation or advice related to any specific patient.

CASE

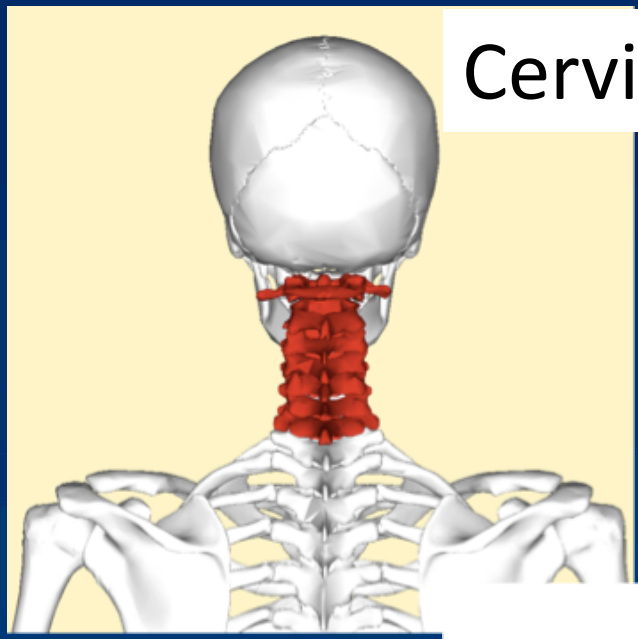
- 39 year old woman brought in by ambulance from the street. She is A/O, has intense pain in the posterior neck, a temperature of 38 C, and a white cell count of 14,000. Both her ESR and CRP are elevated. CXR and UA unremarkable.
- She is couch-surfing and has been using IV heroin for several years.
- Antibiotics are started, she is admitted and the next morning is c/o numbness and mild weakness in both arms

QUESTION

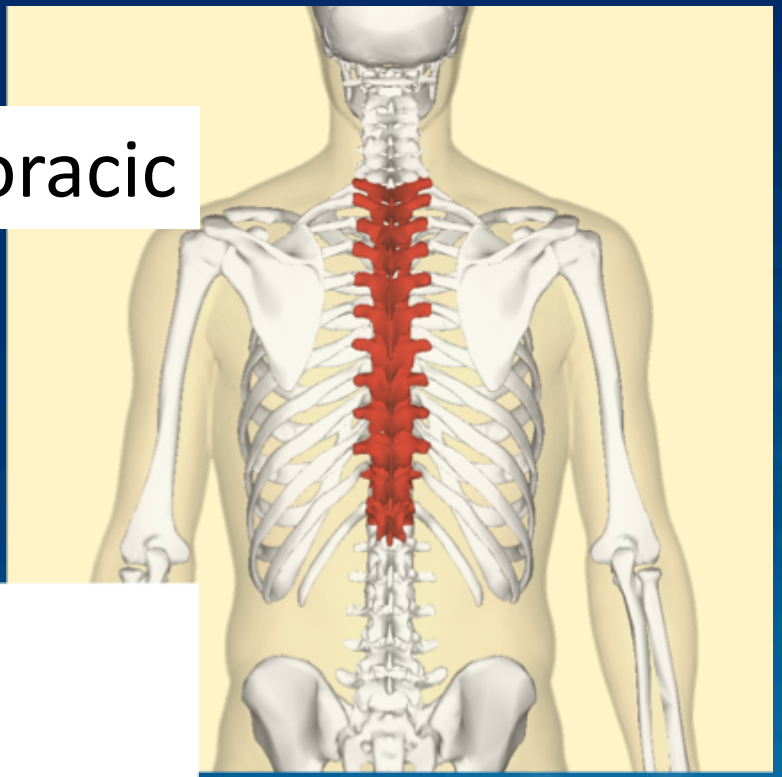
What empiric antimicrobials should be started?

A. IV vancomycin
B. IV levofloxacin
C. IV ceftriaxone
D. IV ceftriaxone + IV vancomycin
E. IV meropenem
F. IV ceftaroline

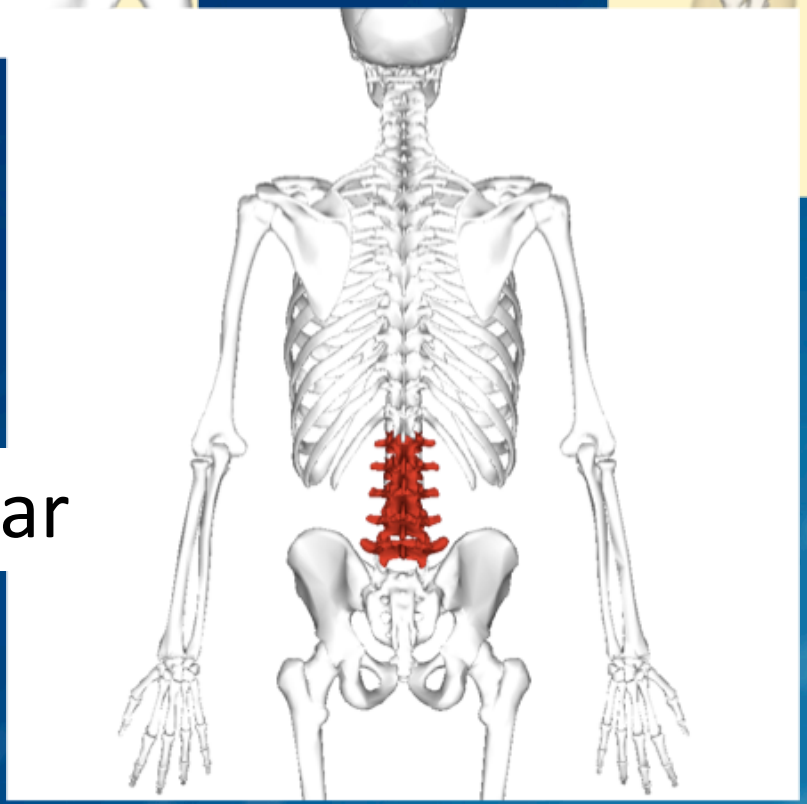
Cervical



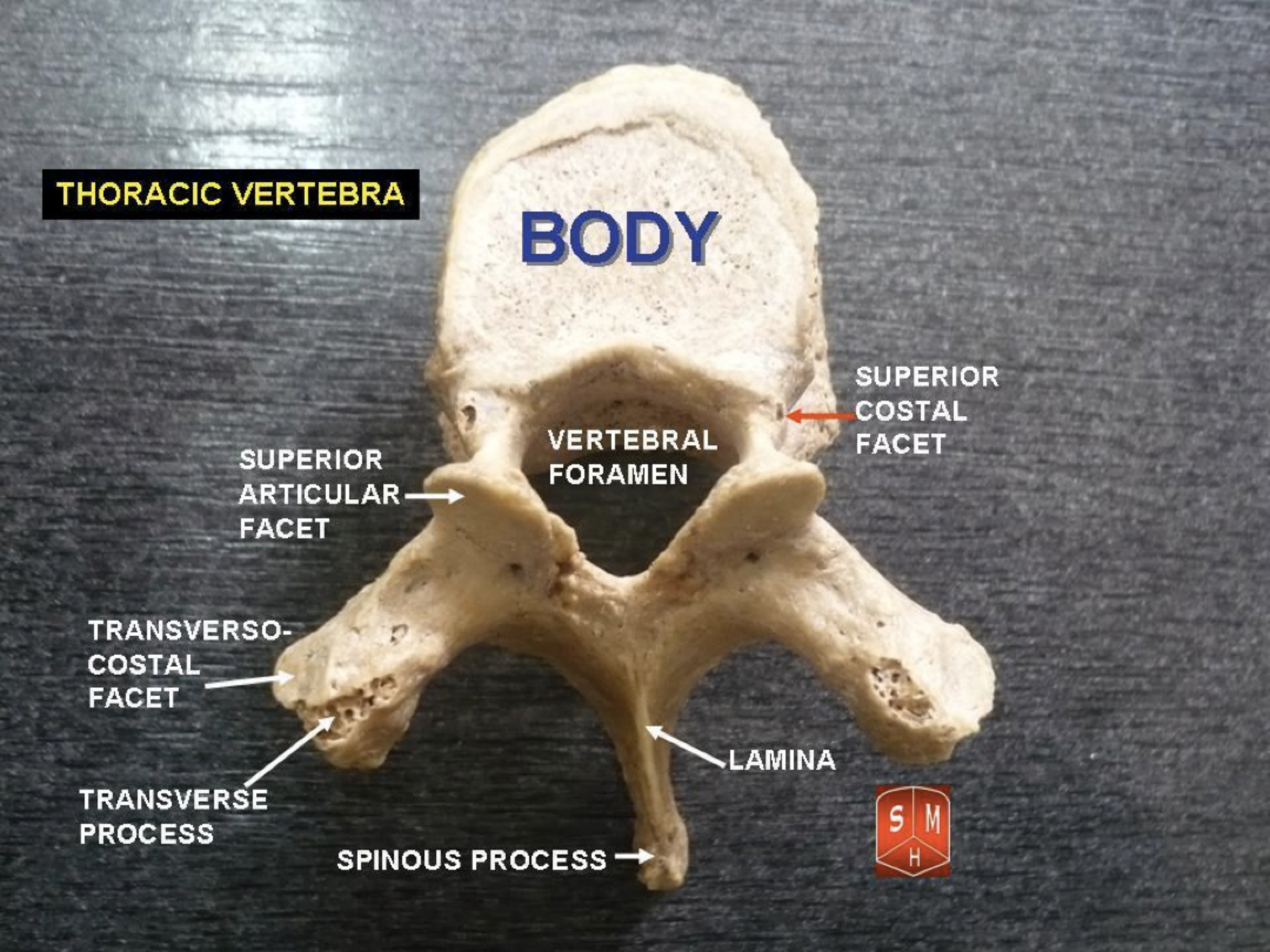
Thoracic



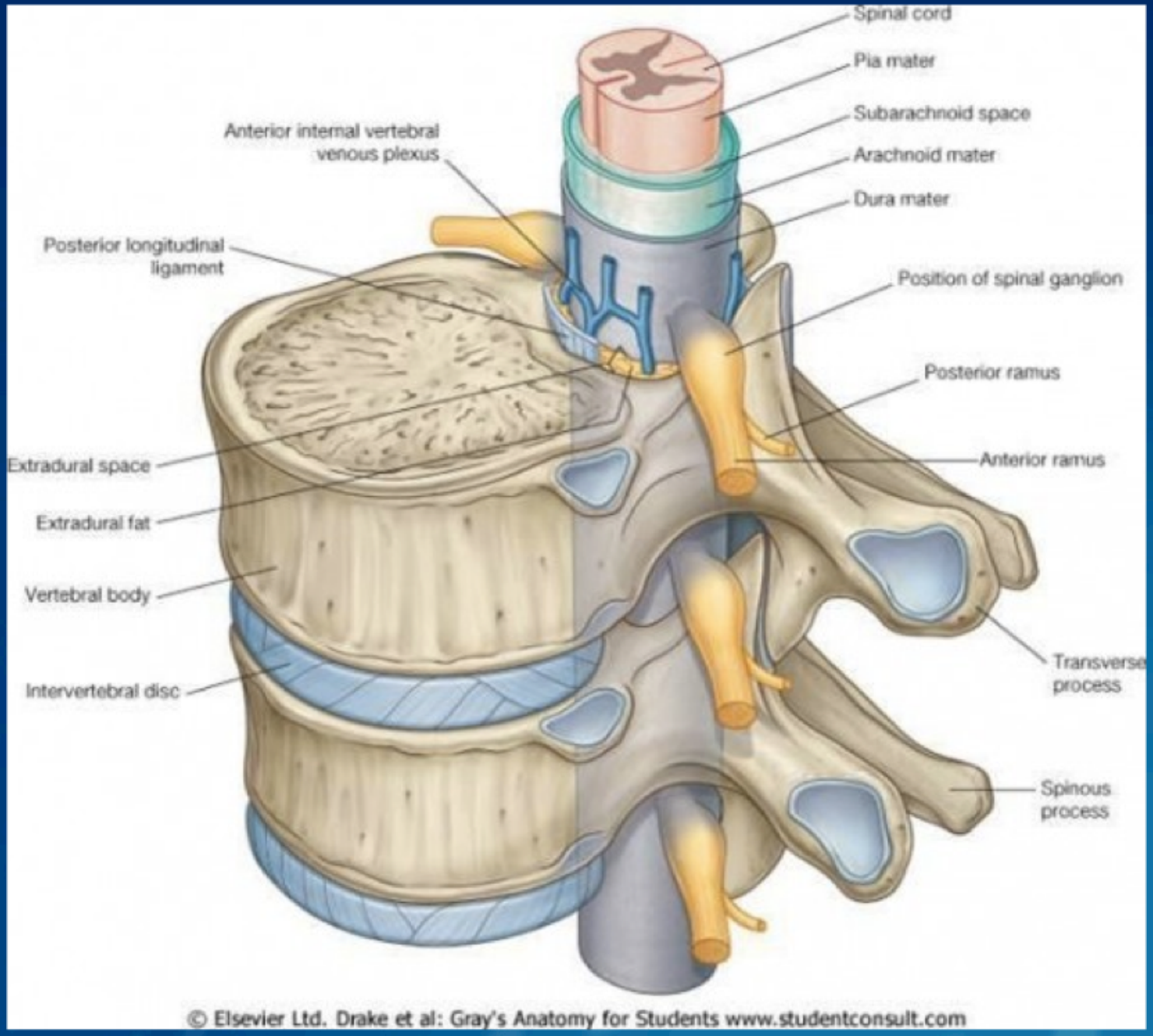
Lumbar



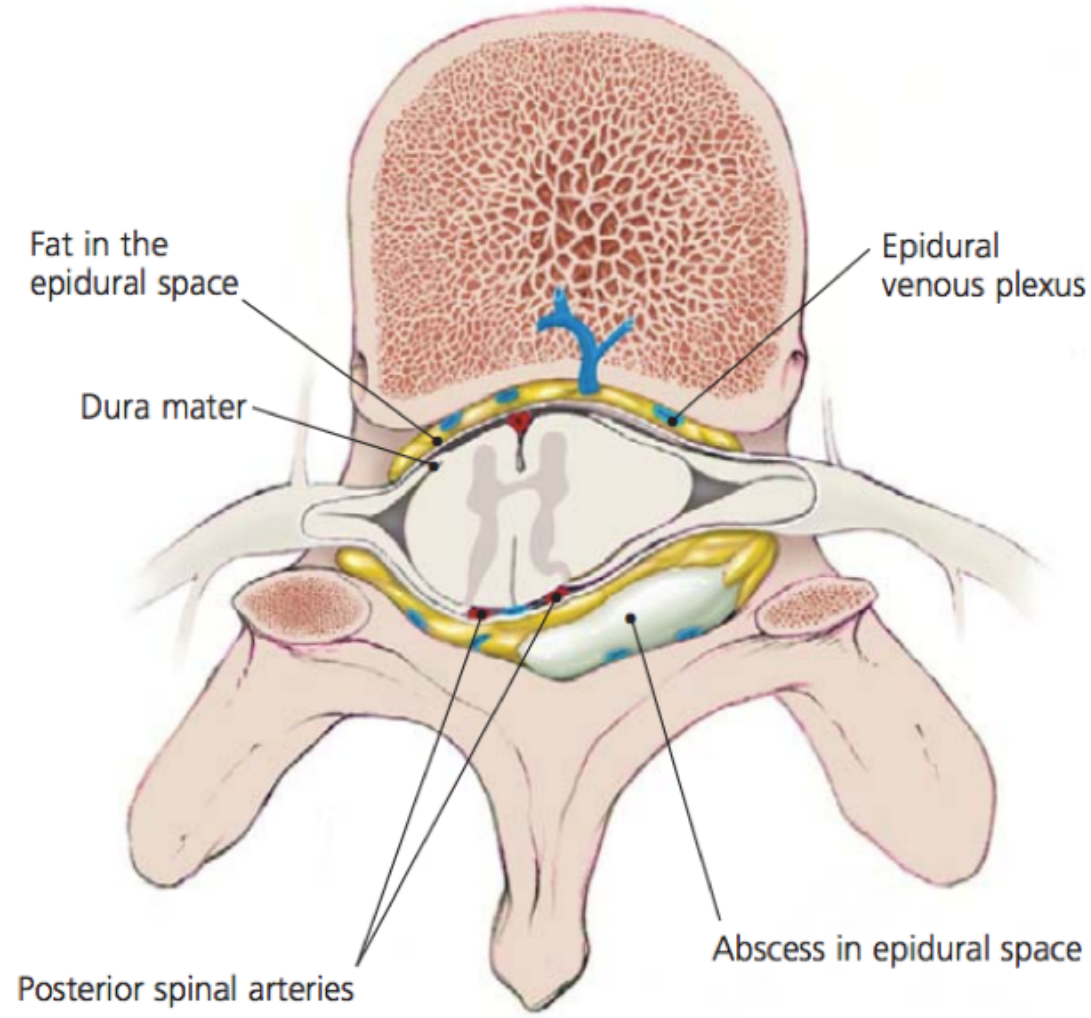
Wikimedia Commons

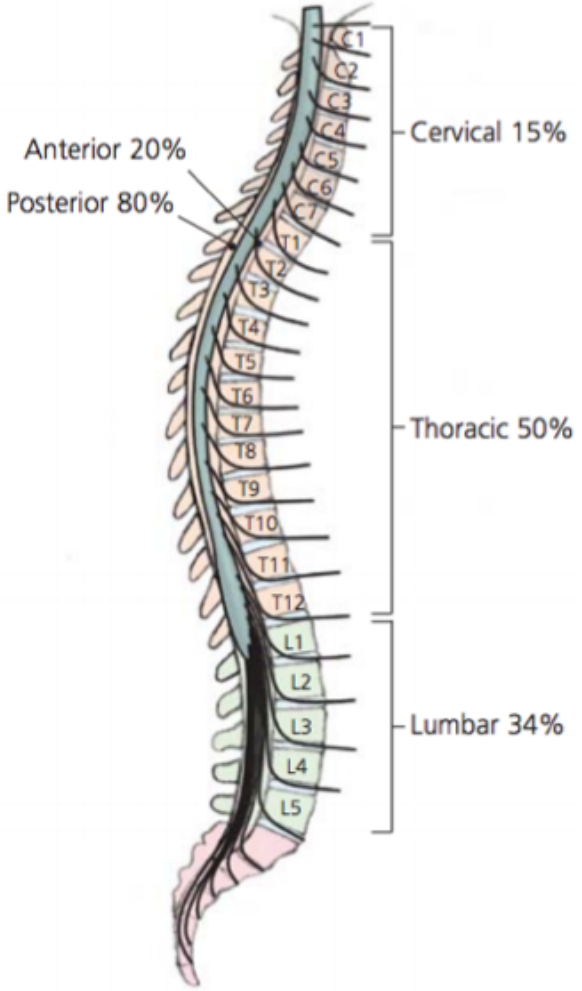

THORACIC VERTEBRA
BODY
SUPERIOR COSTAL FACET
VERTEBRAL FORAMEN
SUPERIOR ARTICULAR FACET
TRANSVERSO-COSTAL FACET
LAMINA
TRANSVERSE PROCESS
SPINOUS PROCESS
S
M
H

Wikimedia Commons



EPIDURAL ABSCESS

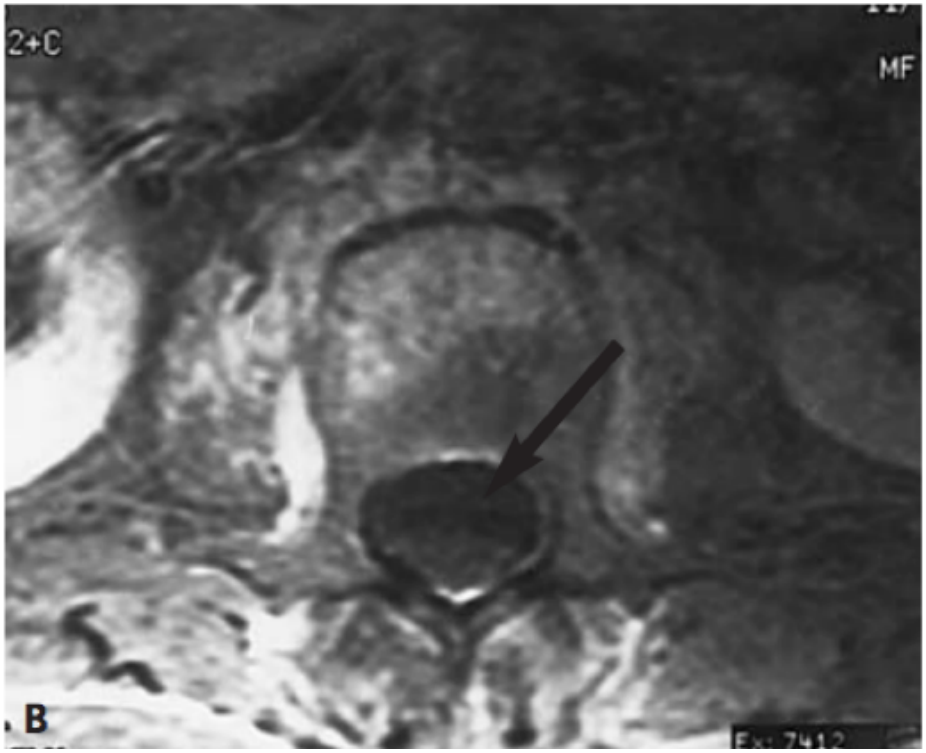


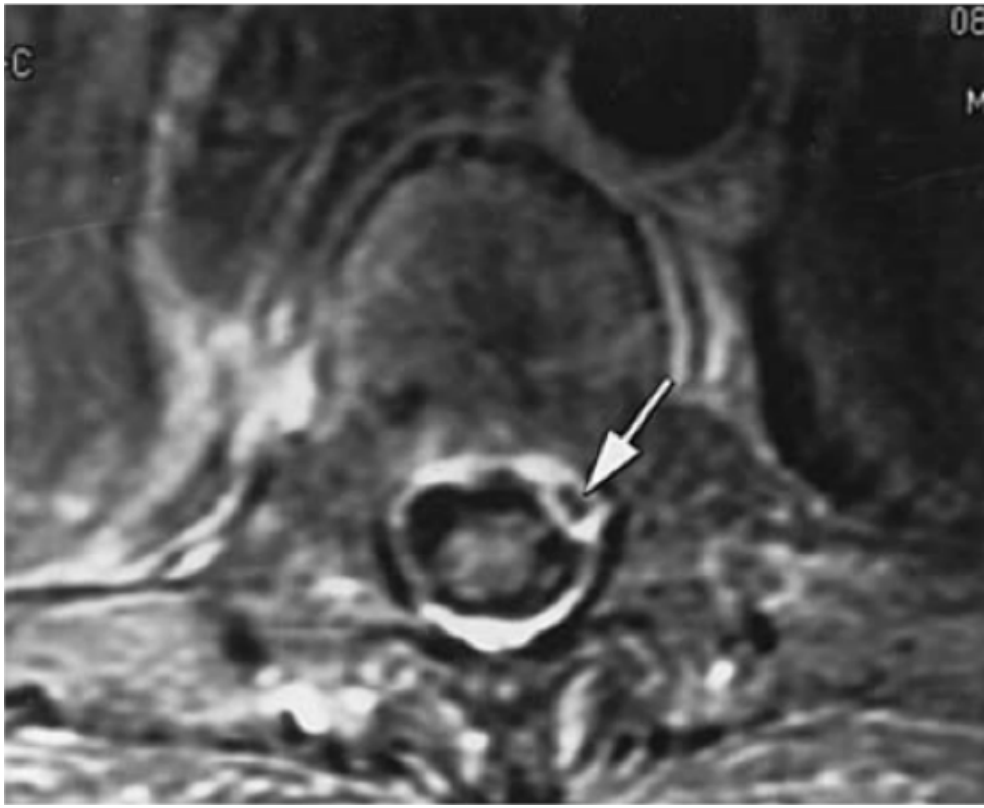


Chao AAFP 2002

UWTASP tele-antimicrobial stewardship program

EPIDURAL ABSCESS





Chao AAFP 2002

EPIDURAL ABSCESS

Predisposing Factors for Epidural Abscess

- Immunodeficiency
  - AIDS
  - Alcoholism
  - Chronic renal failure
  - Diabetes mellitus
  - Intravenous drug abuse
  - Malignancy
- Spinal procedure or surgery
- Spinal trauma

Characteristic	Value
mean age (years)	57.24
sex	
male	62.5%
female	37.5%

Chao AAFP 2002, Arko JNS 2014

UWTASP tele-antimicrobial stewardship program

EPIDURAL ABSCESS

Pathogen	Current Data Set	Reihsaus et al.	p Value
Staphylococcus aureus	63.6% (1069)	66.4% (830)	0.21
MRSA	19.9% (1042)		
MSSA	38.9% (1012)		
coagulase-negative *Staphylococcus*	7.5% (571)	4.2% (830)	0.01
Streptococcus species	6.8% (1053)	6.9% (830)	0.98
gram-negative bacteria	8.1% (992)	7.2% (830)	0.50
polymicrobial	4.9% (588)	3.3% (830)	0.11
none	13.9% (938)	7.3% (830)	<0.01

Arko JNS 2014

UWTASP tele-antimicrobial stewardship program

EPIDURAL ABSCESS

What empiric antimicrobials should be started?

A. IV vancomycin
B. IV levofloxacin
C. IV ceftriaxone
D. IV ceftriaxone + IV vancomycin
E. IV meropenem
F. IV ceftaroline

EPIDURAL ABSCESS

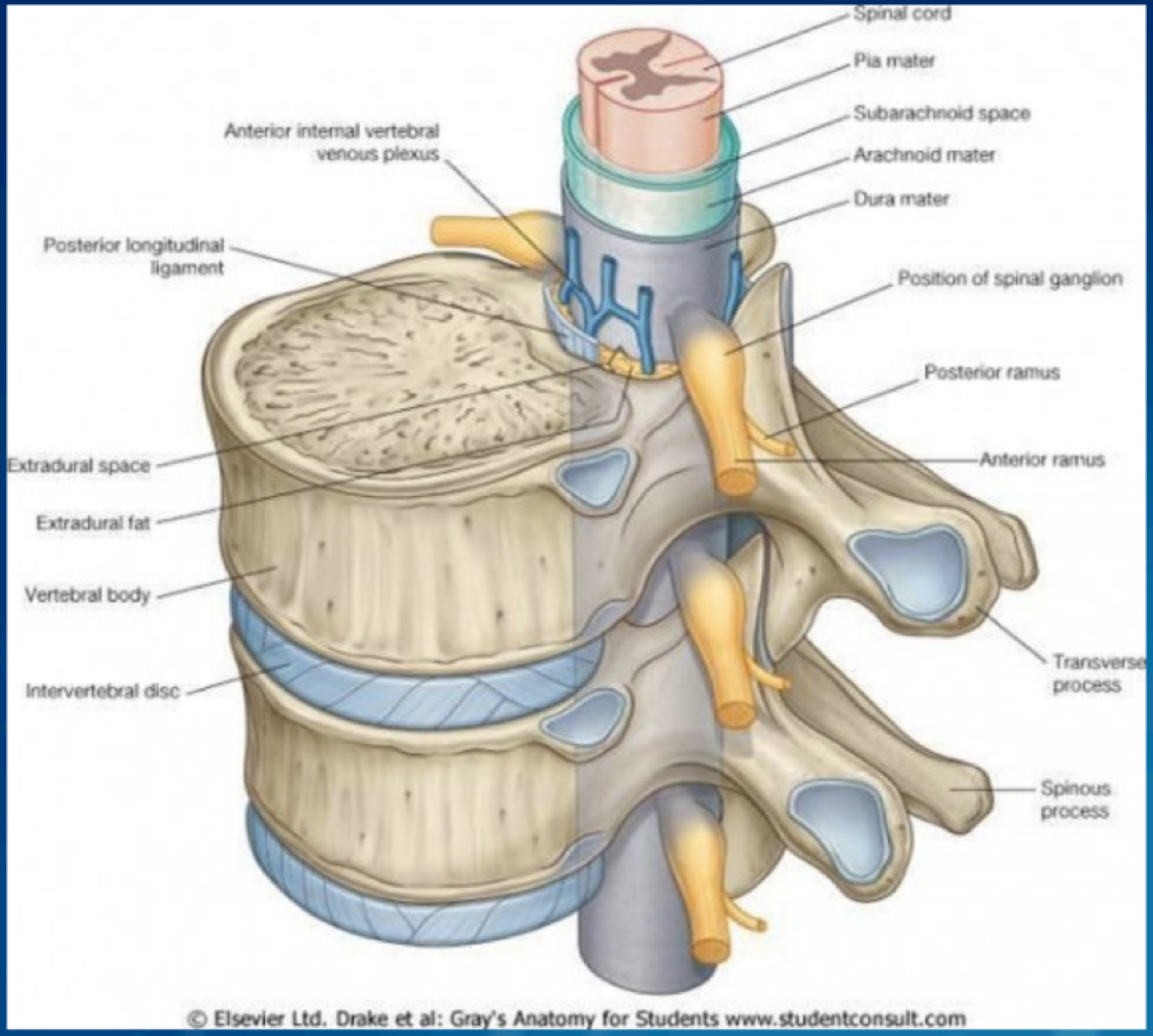
What empiric antimicrobials should be started?

A. IV vancomycin
B. IV levofloxacin
C. IV ceftriaxone
D. IV ceftriaxone + IV vancomycin
E. IV meropenem
F. IV ceftaroline

Plus evaluation for urgent decompression

OSTEOMYELITIS OF THE SPINE

- Biggest risk factors: same case as prior + instrumentation of the spine (surgery and injections)
- May be the antecedent factor leading to epidural abscess or may remain limited to the bone (most common)
- Spondylitis = osteomyelitis of the spine



Spondylitis

Approach?

- If not sick -> biopsy, sample, surgery then start empiric antimicrobials
- If sick -> empiric antimicrobials and try to get a sample ASAP

Spondylitis

Staphylococci, 39%

- Staphylococcus aureus, 36%
- Staphylococcus epidermis, 3%

Gram-negative bacteria, 39%

- Escherichia coli, 23%
- Pseudomonas aeruginosa, 5%
- Eikenella corrodens, 3%
- Proteus mirabilis, 3%

Streptococci, 19%

- Streptococcus sanguis, 8%
- Streptococcus agalactiae, 5%

Empiric treatment?

A. IV vancomycin
B. IV levofloxacin
C. IV ceftriaxone
D. IV ceftriaxone + IV vancomycin

A. IV meropenem
B. IV ceftaroline

Spondylitis

Directed therapy?

PO vs IV?

Duration?

Spondylitis

	6-week regimen	12-week regimen	Difference in proportion of patients*	95% CI
Intention-to-treat analysis, n	176	175		
Cured	160 (90·9%)	159 (90·9%)	+0·1	−6·2 to 6·3
Cured and alive†	156 (88·6%)	150 (85·7%)	+2·9	−4·2 to 10·1
Cured without further antibiotic treatment‡	142 (80·7%)	141 (80·6%)	+0·1	−8·3 to 8·5
Per-protocol analysis, n	146	137		
Cured	137 (93·8%)	132 (96·4%)	−2·5	−8·2 to 2·9
Cured and alive†	133 (91·1%)	126 (92·0%)	−0·9	−7·7 to 6·0
Cured without further antibiotic treatment‡	NA	NA	NA	NA

UWTASP
tele-antimicrobial stewardship program

Spondylitis

	6-week regimen (n=176)	12-week regimen (n=175)	Total (n=351)	p value
Back pain at 1 year	44/145 (30%)	41/138 (30%)	85/283 (30%)	1
Fever at 1 year (no=0, yes=1)	0	1 (1%)	1 (<1%)	0·48
C-reactive protein concentration at 1 year, mg/L	4·2 (1·9–7·2)	3·2 (1·8–6)	4 (1·8–6·3)	0·22
Adverse events	51 (29%)	50 (29%)	101 (29%)	1
Death	14 (8%)	12 (7%)	26 (7%)	0·85
Cardiorespiratory failure	7 (4%)	12 (7%)	19 (5%)	0·33
Digestive tract bleeding	4 (2%)	2 (1%)	6 (2%)	0·68
Clostridium difficile infection	2 (1%)	2 (1%)	4 (2%)	1
Antibiotic intolerance	12 (7%)	9 (5%)	21 (6%)	0·66
Other infection (not vertebral osteomyelitis)	5 (3%)	7 (4%)	12 (3%)	0·76
Device infection	1 (1%)	2 (1%)	3 (1%)	0·62
Neurological complications	7 (4%)	3 (2%)	10 (3%)	0·34
Endocarditis	3 (2%)	4 (2%)	7 (2%)	0·72

Questions?

UWTASP
tele-antimicrobial stewardship program