

Problem-Based Learning Exercise:

A 9yo male comes in the emergency room with a new rash. He is well appearing and denies any recent fever. His left thigh has a 1cm area of fluctuance and a 3cm area of surrounding erythema. The site has warmth, tenderness to palpation and mild edema. He has no other physical exam findings currently. You make a diagnosis of community acquired purulent cellulitis. You perform an incision and drainage and send the sample for culture. What is the most common organism to cause this infection?

- A. *Escherichia coli*
- B. *Proteus mirabilis*
- C. *Pseudomonas aeruginosa*
- D. *Staphylococcus aureus*
- E. *Staphylococcus epidermidis*

Gram Positive Cocci (non-urine)	No. of Isolates	Penicillin	Ampicillin	Ampicillin/Sulbactam	Amox/Clav	Cefazolin	Cefepime	Ceftriaxone	Cefotaxime	Clindamycin	Azithromycin	Erythromycin	Gentamicin	Levofloxacin	Oxacillin	Rifampin	Linezolid
<i>Streptococcus pneumoniae</i>	37	100/79*						100/97*	100/94*	94	61			97			
<i>Streptococcus mitis/oralis</i>	18	67					78	89	89	94				88			
Other <i>Streptococcus</i> spp. viridans group	28	79					96	96	95	82				95			
<i>Streptococcus pyogenes</i> (Grp A)	53	100					100	100		94			92				
<i>Streptococcus agalactiae</i> (Grp B)	8	100	100							57		38					
<i>Enterococcus faecalis</i> *	81		99											95		37	98
<i>Enterococcus faecium</i> *	13		83											45		33	100
<i>Staphylococcus aureus</i> - MSSA	573	25		100	100	100				71		60	98	93	100	99	100
<i>Staphylococcus aureus</i> - MRSA	131	0		0	0	0				65		18	94	52	0	96	100
<i>Staphylococcus epidermidis</i>	96	7		27	27	27				42		15	63	67	25	97	100
Other <i>Staphylococcus</i> species	39	21		46	46	46				54		34	91	91	44	97	100

Based on the Lurie institutional antibiogram, approximately what percentage of *Staphylococcus aureus* isolates are resistant to methicillin or 1<sup>st</sup> generation cephalosporins (i.e. Keflex/cephalexin, Ancef/cefazolin)?

- A. 10%
- B. 20%
- C. 50%
- D. 80%
- E. 100%

What percentage of *Staphylococcus epidermidis* are susceptible to levofloxacin?

- A. 52%
- B. 67%
- C. 91%
- D. 93%
- E. 100%

You decide that you will discharge this patient on oral antibiotics for a 5-day course of therapy. What is the most appropriate antibiotic for this patient?

- A. Bactrim/TMP-SMX
- B. Clindamycin
- C. Keflex/Cephalexin
- D. Linezolid
- E. Vancomycin

Two days later, you receive a phone call from the microbiology lab informing you that your culture is positive for *Staphylococcus aureus*. The report includes the following susceptibility report:

Antibiotic	MIC	Interpretation
Amoxicillin/Clavulanate	$\leq 4/2$	Susceptible
Ampicillin/Sulbactam	$\leq 8/4$	Susceptible
Cefazolin	$\leq 4$	Susceptible
Clindamycin	8	Resistant
Gentamicin	$\leq 1$	Susceptible
Levofloxacin	$\leq 0.5$	Susceptible
Vancomycin	1	Susceptible
Meropenem	$\leq 2$	Susceptible
Oxacillin	$\leq 0.25$	Susceptible
Penicillin	8	Resistant
TMP-SMX	$\leq 0.5/9.5$	Susceptible
Daptomycin	0.5	Susceptible
Linezolid	2	Susceptible
Tetracycline	$\leq 1$	Susceptible

Which of the following statements is true?

- A. Daptomycin (MIC 0.5) is superior to vancomycin (MIC 1) for this infection because of a lower MIC
- B. This bacterium can be characterized as methicillin resistant *Staphylococcus aureus* (MRSA)
- C. Your original choice of antibiotic for this patient needs to be altered for appropriate therapy
- D. Cephalexin is an appropriate antibiotic for this bacterial isolate
- E. Levofloxacin is a better choice for this infection because it has a narrower spectrum of activity than your original choice of antibiotic
- F. A & D
- G. A & C