

# APP Antibiotic Stewardship Series: Skin and Soft Tissue Infections

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#IDTwitter



# Project Origins

- Antimicrobial resistance is a significant problem facing the medical community and world
- Most services in the hospital encounter common infectious disease problems
- Most services at LCH engage APP's in a large proportion of all patient care
- ID education is directed mostly at MD/DO trainees and providers



# Learning Objectives

- Identify the two most common bacteria that cause skin and soft tissue infections
- Identify the most appropriate first line antibiotic for simple skin and soft tissue infections
- Recognize the utility of institutional and global antibiograms in choosing empiric antibiotics
- Demonstrate how to use microbiology reports to alter therapy based on antibiotic susceptibility

# Case Presentation

A 13yo boy comes to clinic because of a rash on his R arm. He thought it was a bug bite, but it continued to grow. He endorses pain, mild swelling and it feels warm to the touch. He denies fever, chills, purulent drainage.

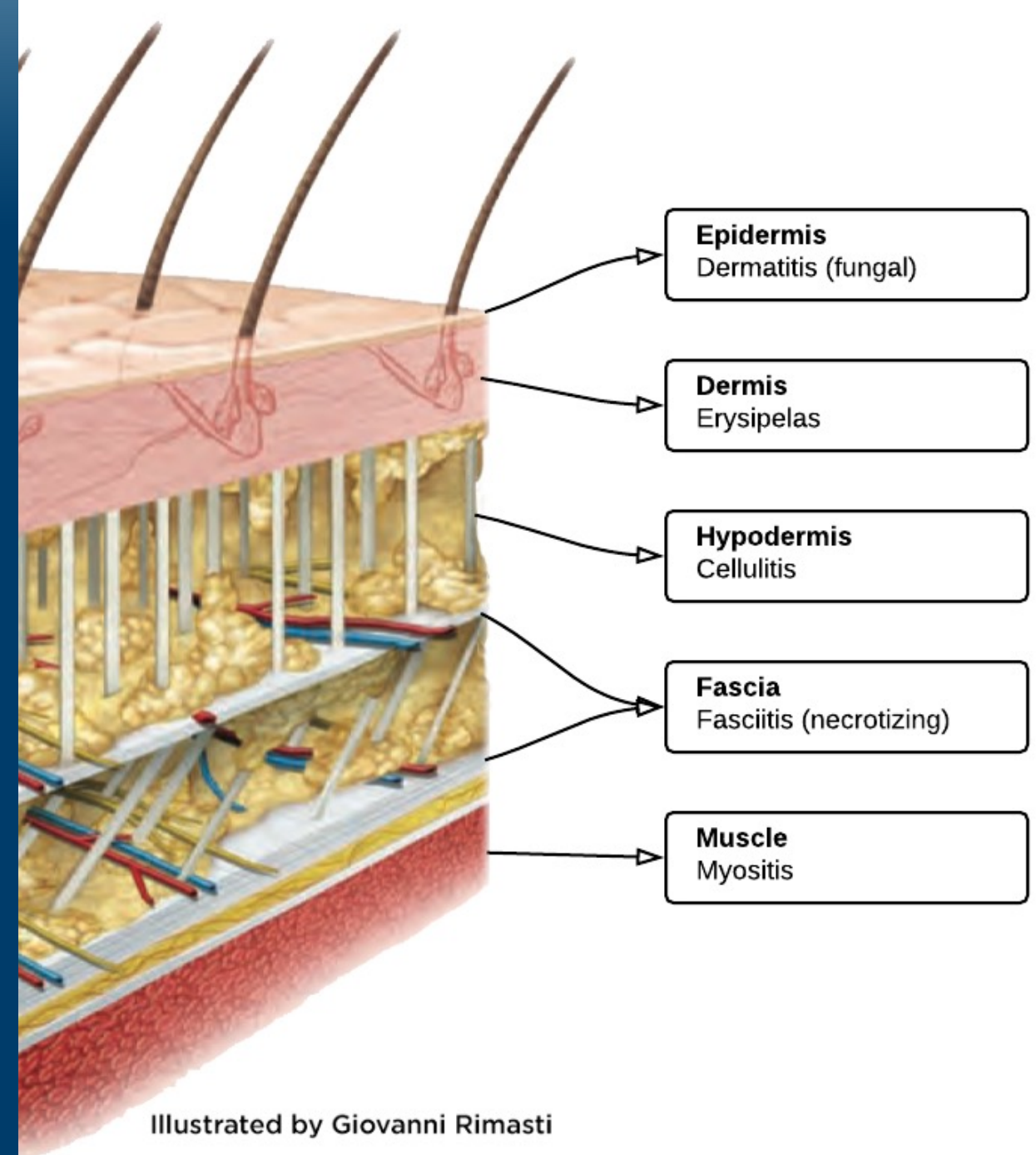
Physical exam is significant for a 4cm area of erythema, without clear borders, that is warm to the touch with mild tenderness to palpation. There is a small area of induration with fluctuance.

You make a diagnosis of cellulitis with abscess.



# Skin Infections

- Cellulitis = bacterial infection of the hypodermis
  - Fades off into distance
  - *Staph aureus* > *Group A Strep*
- Erysipelas = bacterial infection of the dermis
  - Discrete borders
  - *Group A Strep* > *Staph aureus*





### Prescribing Resources

Category	Name
+ 01-Optimizing Specimen Collection (2)	
+ 02-Clinical Care Guidelines (16)	
+ 03-Institutional Antibiotic Susceptibilities (1)	
+ 04-Dosing Resources (1)	
+ 05-Interpreting Rapid Diagnostics (3)	
+ 06-True pathogen vs. Contamination/Colonization (1)	
+ 07-Pharmacokinetics & Pharmacodynamics (1)	
+ 08-Therapeutic Drug Monitoring (1)	
+ 09-Antimicrobial Adverse Events (2)	
+ 10-Choosing Duration of Therapy (1)	
+ 11-Perioperative Prophylaxis (5)	
+ 12-Communicating with Families (5)	

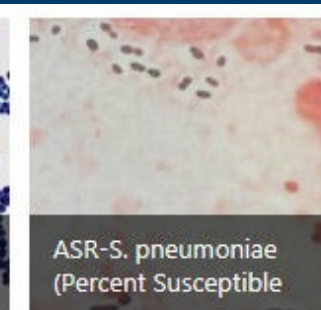
### Antimicrobial Utilization

Category	Name
+ A01-ASP Documents (2)	
+ A02-Benchmarking (1)	
+ A03-Lurie Trends (37)	
+ A04-Restricted Antimicrobials (2)	

### Education

Category	Name
+ E01-Public Health (1)	
+ E02-Resistance Mechanisms (1)	
+ E03-Spectrum of Activity of Antimicrobials (4)	
+ E04-Susceptibility Test (2)	

URL	Notes
<b>4 - : Scholarship and Advocacy (2)</b>	
Areas of Study and Publications	...
Collaborations	...
<b>4 - : Lurie Children's Hospital Days of Therapy by Department (1)</b>	
Lurie Children's Hospital Days of Therapy (DOT) by Department	...
<b>4 - : Additional Resources (11)</b>	
Antimicrobial Susceptibility Report	... Antibiogram
ASP Article of the Month	...
ASP Handbook-2021	...
CDC Core Elements	...
Health Care Without Harm	... Public Health
IDSA	...
Illinois Department of Public Health	... Public Health
Infection Control Manual	...
Joint Commission Guidelines	...
U.S.PIRG	... Public Health
World Health Organization	... Public Health



# Antibiogram

- Collection of yearly culture and susceptibility results available on Epic
- Used to determine the narrowest, most reasonable empiric therapy

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		57	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	28	97	100
Other <i>Staphylococcus</i> species	39	21		46	46	46				54		34	91	91	44	97	100

# Antibiogram

- Cephalexin = Covers 100% of MSSA (573), 0% MRSA (0) → 81% of all
- Clindamycin = Covers 71% of MSSA (407), 65% MRSA (85) → 70% of all

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Cefazolin/Ancef (IV),  
Cephalexin/Keflex (PO)

81%  
coverage  
of *S.*  
*aureus*

Clindamycin (IV/PO)

70%  
coverage  
of *S.*  
*aureus*

Spectrum: Gram positive

Spectrum: Gram positive cocci

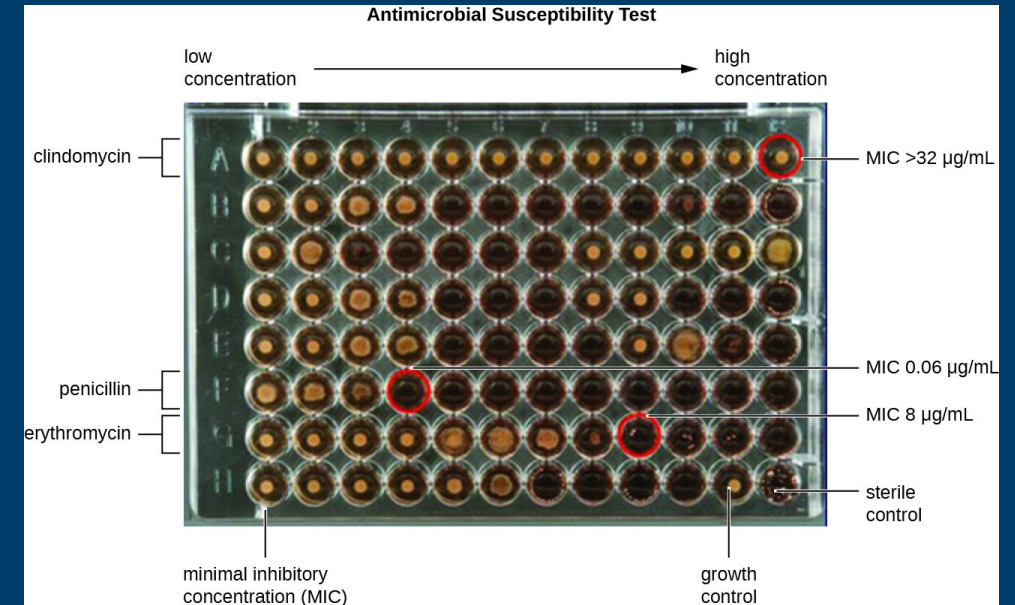
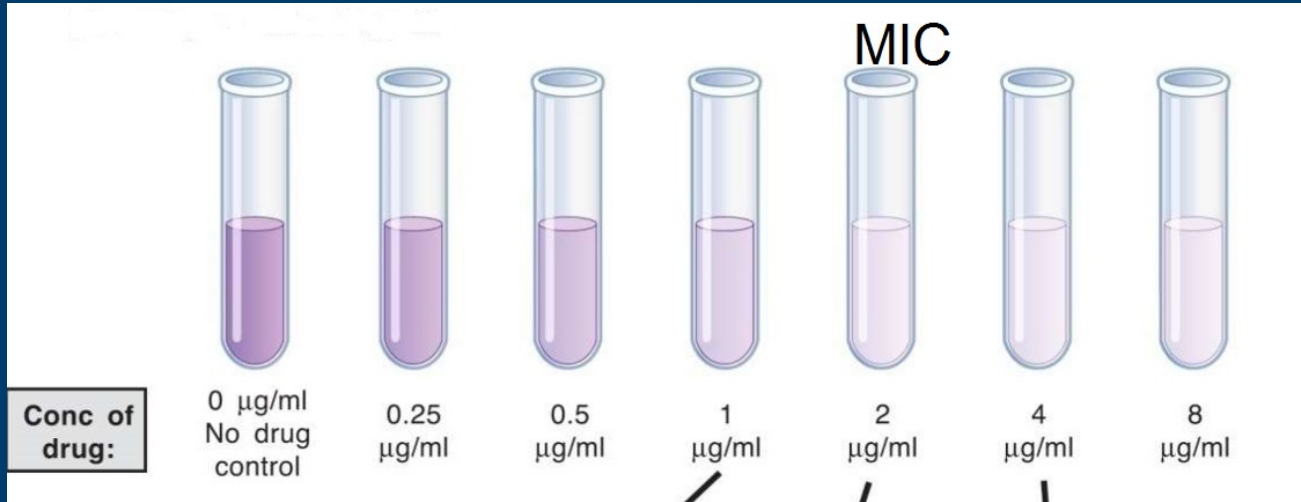
Skin/Soft Tissue Infection			
Impetigo	<i>S. aureus</i> , GAS	Mupirocin topical BID <u>If multiple lesions or in outbreaks to reduce transmission</u> Cephalexin 50 mg/kg/day PO divided TID	Duration 5-7 days
Erysipelas	GAS and other beta-hemolytic Streptococci	Cephalexin 16.7 mg/kg/dose PO TID <u>Severe B-lactam allergy</u> Clindamycin 10 mg/kg/dose every 8 hours (max dose 600 mg) OR	Duration 5-7 days
Cellulitis w/o purulence	GAS and other beta-hemolytic Streptococci,	<u>Outpatient:</u> Cephalexin 16.7 mg/kg/dose PO TID <u>Inpatient:</u> Cefazolin 25 mg/kg/day IV q8h	Duration 5-7 days

- SKIN/SOFT TISSUE INFECTION
- Simple Cystitis, Pyelonephritis

- Poor oral bioavailability

- High oral bioavailability
- Significant increased risk of *Clostridium difficile*

# Minimum Inhibitory concentration



Antimicrobial Agent	<i>Staphylococcus</i> spp. Indications	Disk Content	Zone Diameter Breakpoints, nearest whole mm				MIC Breakpoints, µg/mL			
			S	SDD	I	R	S	SDD	I	R
<b>PTIDES</b>										
ests should be performed to determine the susceptibility of all isolates of staphylococci to vancomycin. The disk test does not differentiate among vancomycin-susceptible, -intermediate, and -resistant <i>S. aureus</i> , all of which give similar size zones of inhibition.										
Vancomycin	<i>S. aureus</i>	-	-	-	-	-	≤2	-	4-8	≥16



# TMP-SMX/Bactrim (IV/PO)

- Spectrum: Gram positive cocci, gram negative rods
  - MRSA/MSSA, Group A *Strep*
- Common indications
  - Skin/Soft Tissue Infection
  - Simple Cystitis, Pyelonephritis
  - PJP Prophylaxis/Disease

Antibiotic	MIC	Interpretation
Amoxicillin/Clavulanate	16/4	Resistant
Ampicillin/Sulbactam	32/16	Resistant
Cefazolin	8	Resistant
Clindamycin	8	Resistant
Gentamicin	$\leq 1$	Susceptible
Levofloxacin	$\leq 0.5$	Susceptible
Vancomycin	1	Susceptible
Meropenem	8	Resistant
Oxacillin	8	Resistant
Penicillin	8	Resistant
TMP-SMX	$\leq 0.5/9.5$	Susceptible
Daptomycin	$\leq 0.5$	Susceptible
Linezolid	2	Susceptible
Tetracycline	$\leq 1$	Susceptible