

Antibiotic Update 2022

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Professor of Medicine

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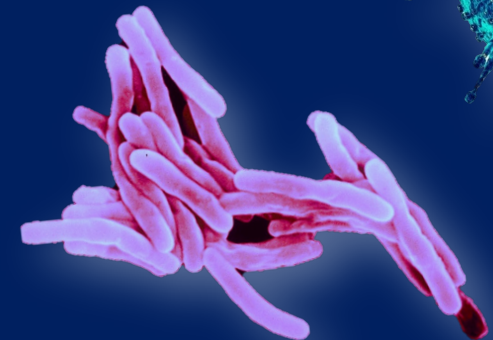
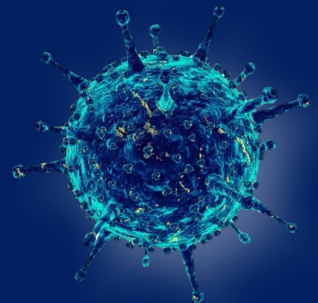
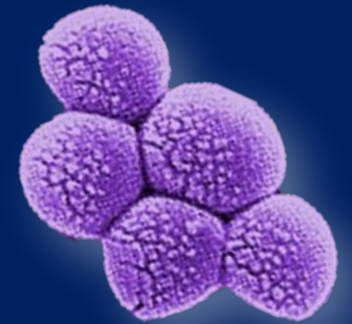
University of Washington

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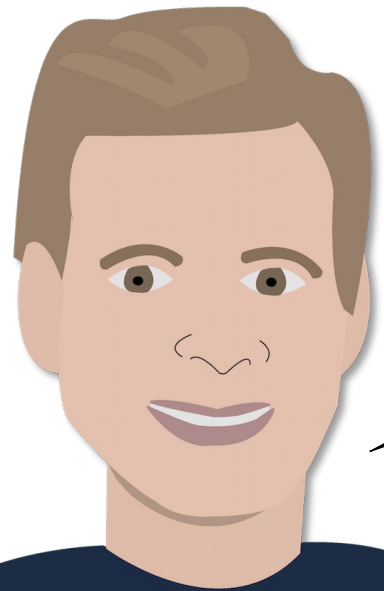
What's New in Medicine

Kennewick, WA

September 9, 2022



Antibiotic Update: *Disclosures*



Paul Pottinger MD

Has no relevant financial relationships with ineligible companies to disclose.

Antibiotic Update: *WNIM* Honorarium



Hello. I'm **PAL-ergy**

Your pal in the fight against bogus antibiotic allergies.

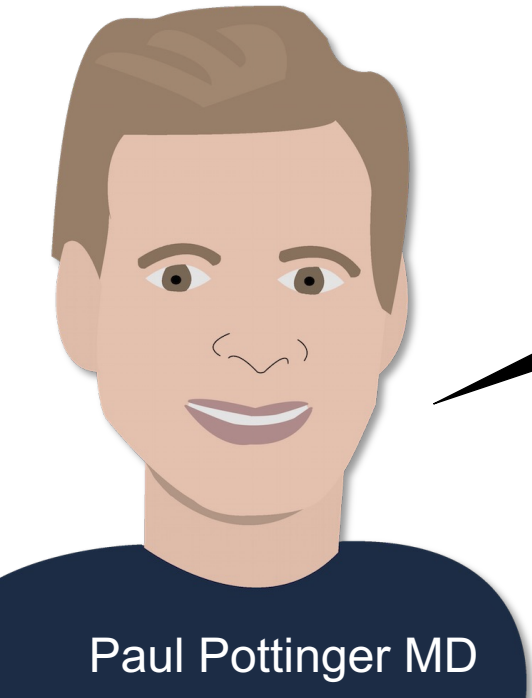
Penicillin Allergy Assessment Tool

This is a place to add text. You can write anything you like here. Or here. Or even here. There is literally no limit to what you can write. So Fun!

Coming soon as an app!



Antibiotic Update: *Disclaimer*

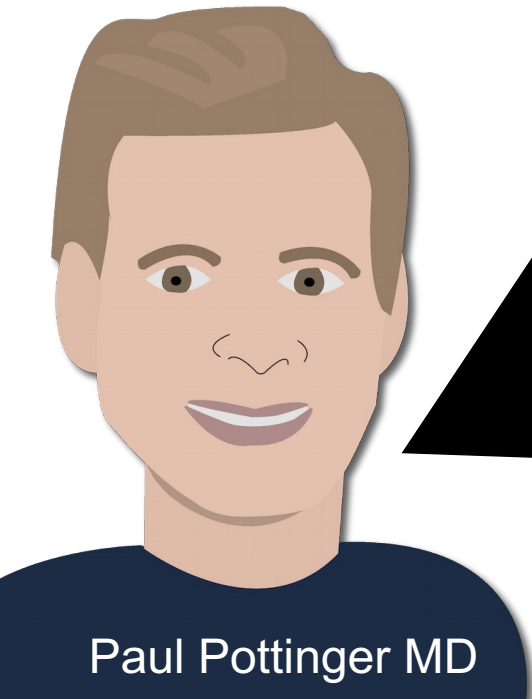


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Off-Label Antibiotic Use

- Yep, we will discuss this.
- I will call it out.

Antibiotic Update: *Objectives*



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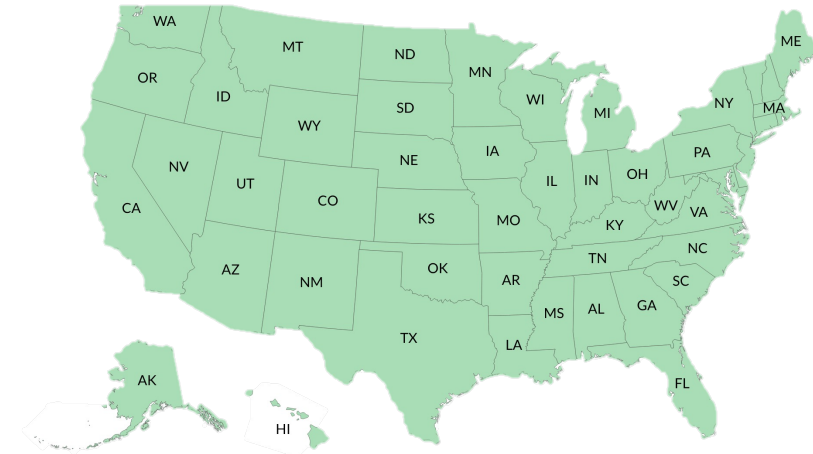
- Know the appropriate selection of the common antibiotics used in the outpatient setting including skin and soft tissue infection as well as upper respiratory tract infection
- Review appropriate antibiotics for the prevention and treatment of special populations with implantable device infection and orthopedic device infection
- Learn to screen patients for penicillin allergy and delabel them when appropriate

Antibiotics in 2022: *Variation in Use*



USA Prescriptions

- Abx Courses / yr: 300M
- Abx for Outpatients: 70%
- Abx Appropriate: 50-70%



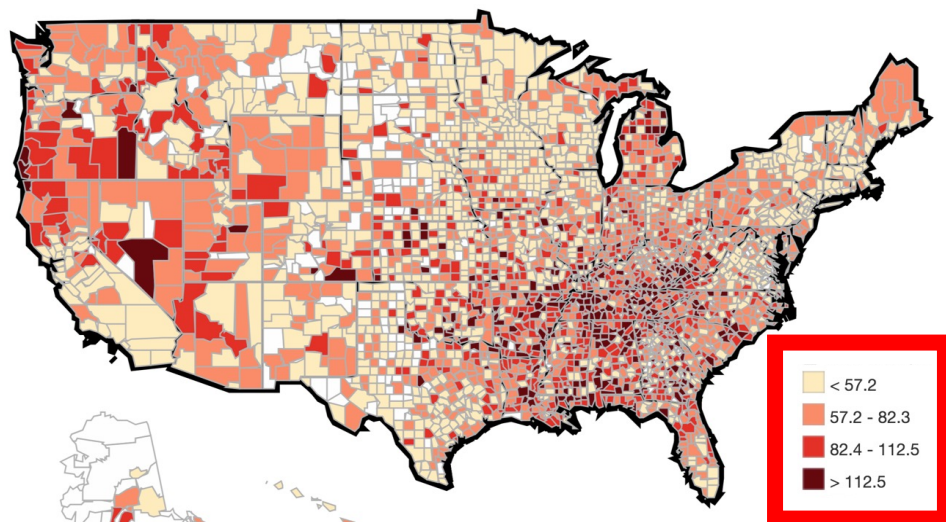
In total, 76% of prescriptions reviewed were deemed inappropriate for the following reasons: (N=3,880)

- No antibiotic was indicated (49.7% of cases);
- The wrong antibiotic was selected (12.3% of cases); and
- The wrong duration of therapy was ordered (14% of cases).

Antibiotics in 2022: Variation in Use

USA Prescriptions

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- Abx A
- Regic

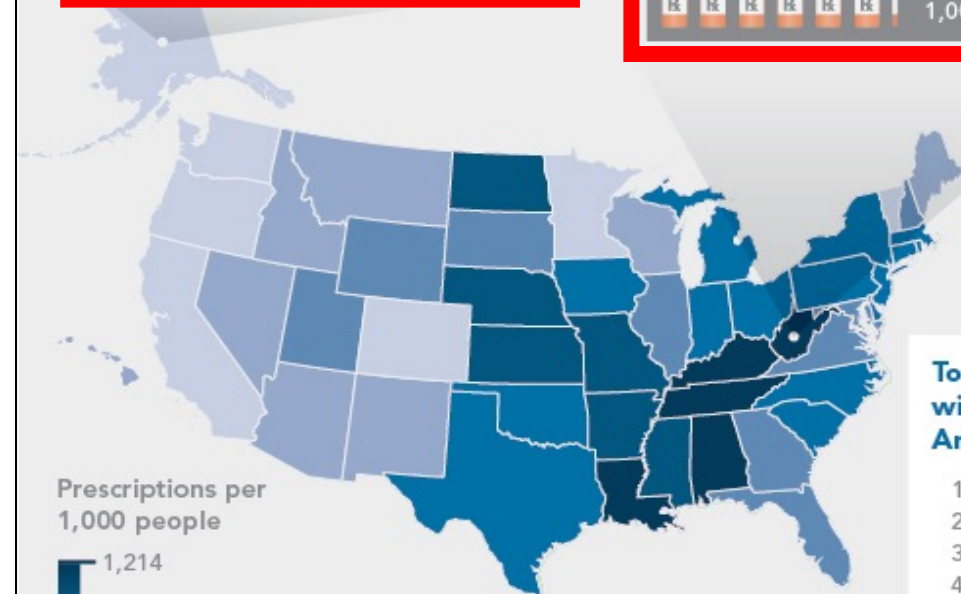
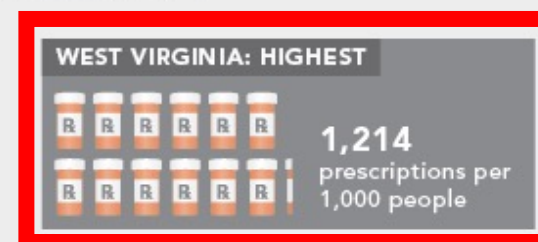


Narcotic Prescriptions per 100 persons

National Antibiotic Use At A Glance

2006-2007

This map from *Extending the Cure* shows wide disparities in consumption of antibiotics across the United States. Antibiotic overuse is a serious problem because the more these drugs are used, the faster bacteria can become resistant to antibiotics, rendering them useless to fight infections. To find out how your state stacks up on antibiotic use, check out *ResistanceMap* (www.cddep.org/resistancemap), an online interactive tool created by *Extending the Cure* with funding from the Robert Wood Johnson Foundation's Pioneer Portfolio.



- ### Top 5 States with the Highest Antibiotic Use
1. West Virginia
 2. Kentucky
 3. Tennessee
 4. Louisiana
 5. Alabama

Source: Based on data obtained under license from IMS Health Xponent™ (Jan. 2006–Dec. 2007). IMS Health Incorporated. All Rights Reserved. The findings, conclusions, and views expressed do not necessarily reflect those of IMS Health or any of its affiliated or subsidiary entities.

Skin & Soft Tissue Infections: *2 Main Flavors*

Cellulitis



- No purulent focus
- Usually beta-hemolytic *Strep* (*S.aureus* less often)

Abscess



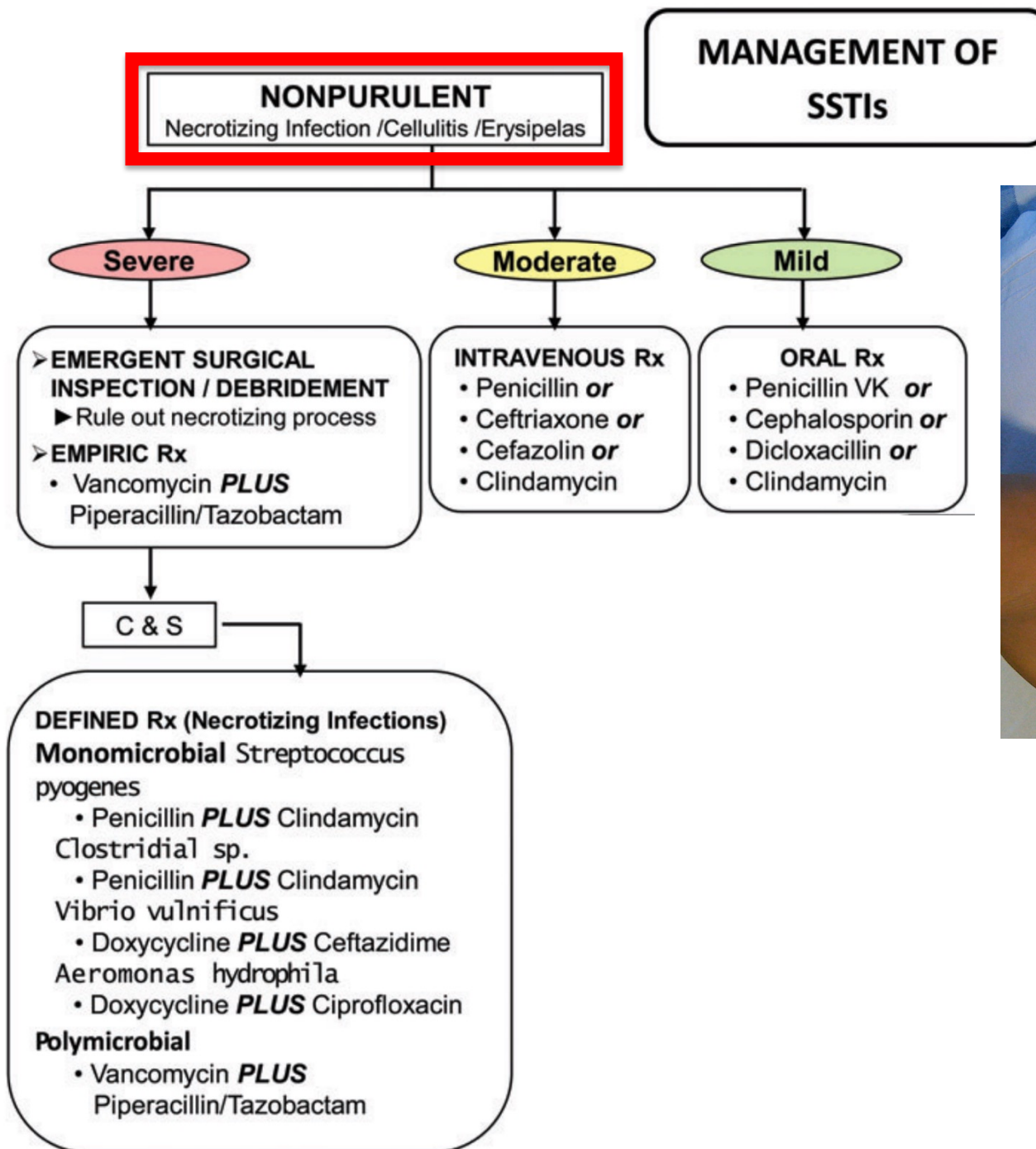
- Pus!
- Usually MRSA or MSSA
- (Group A Strep less often)

SSTI: *How to Cover Cellulitis?*

- 179 pts with non-cultured cellulitis
- All were treated with beta-lactams
- All had acute & convalescent strep serology... 73% ruled in for strep
- 96% had treatment success
- **CAVEAT:** still reasonable to cover MRSA for “high risk” (purulence or personal MRSA history)



**NOT ALL
SSTI IS
STAPH!**



SSTI: *Prevention of Recurrence?*

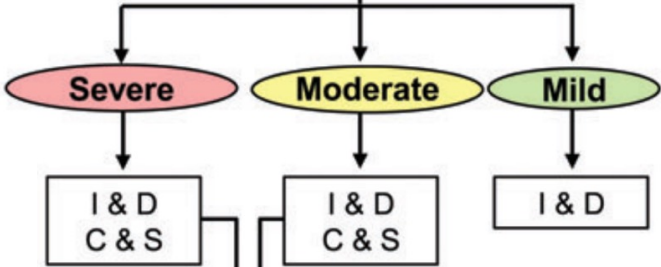
- 274 pts with recurrent cellulitis
- Randomized: PCN-VK 250mg PO BID vs Placebo, followed x 3 years
- Recurrence: 22% PCN vs 37% Placebo
- HR 0.55 [0.35-0.86], p=0.01
- NNT = 5
- Recurrence rates the same once abx stopped.



PCN worth considering in recurrent cases... look for other reversible factors (DM, tinea, Stasis, etc)

MANAGEMENT OF SSTIs

PURULENT
Furuncle / Carbuncle / Abscess



EMPIRIC Rx¹

- Vancomycin *or*
- Daptomycin *or*
- Linezolid *or*
- Televancin *or*
- Ceftaroline

DEFINED Rx

MRSA

- See Empiric

MSSA

- Nafcillin *or*
- Cefazolin *or*
- Clindamycin

EMPIRIC Rx

- TMP/SMX *or*
- Doxycycline

DEFINED Rx

MRSA

- TMP/SMX

MSSA

- Dicloxacillin *or*
- Cephalexin



Abscess: Are you *SURE* I don't need abx?



- DB-RCT: Uncomplicated abscess (all got I&D) randomized to 7 days placebo vs. TMP/SMX
- 12% better outcomes in TMP/SMX arm (both MITT & per-protocol)

Table 3. C

Trial

Per-protocol

FDAGEEP

(-3.0 to 8.1)

0.3

I&D still gold standard for simple abscess! Slightly better cure with TMP/SMX... but at what cost?

* CI denotes confidence interval.

† P values were calculated with a Wald asymptotic test of equality with a continuity correction.

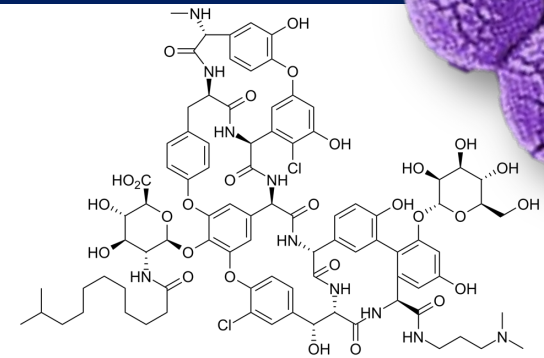
‡ The primary outcome was clinical cure at the test-of-cure visit (7 to 14 days after the end of the 7-day treatment period) in the per-protocol population.

MDR Gram-Positives: *New Anti-MRSA Drugs*



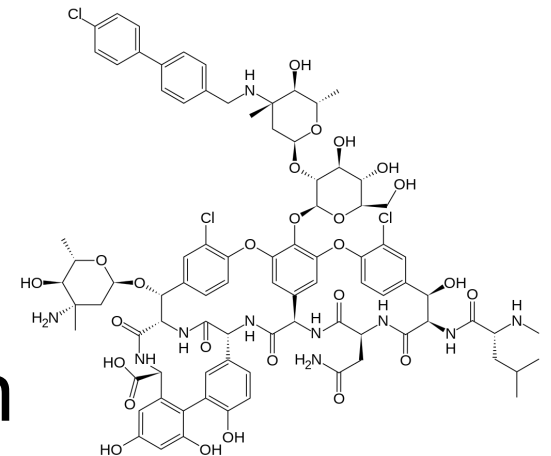
- **Dalbavancin (Dalvance)**

- ✓ Class: Lipoglycopeptide
- ✓ Indication: gram-positive ABSSSI
- ✓ 1.5 gm IV x 1 or 1 gm then 500 mg day 7; “\$4,500 / course”
- ✓ May elevate LFTs; dose reduce in severe liver dysfunction

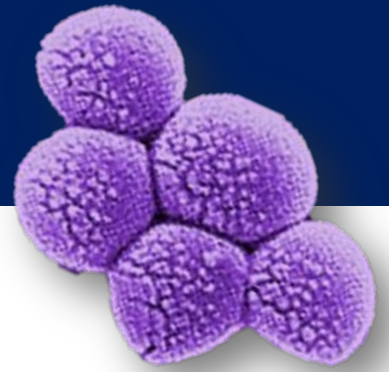


- **Oritavancin (Orbactiv)**

- ✓ Class: Lipoglycopeptide
- ✓ Indication: gram-positive ABSSSI
- ✓ 1.2 gm IV x 1; “\$3000 / course”
- ✓ Falsely elevates aPTT x 5 days post-infusion



MRSA Susceptibility: *Seattle 2022*

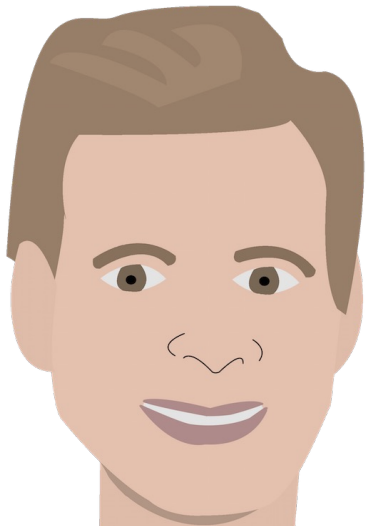


	<u>HMC (52%)</u>	<u>UWMC (35%)</u>
Clindamycin	72%	73%
Levofloxacin	18%	20%
Doxycycline	80%	89%
TMP/SMX	90%	93%
Vancomycin	100%	100%
Linezolid	100%	100%
Daptomycin	100%	100%

Updates in ID: *Vanco for Pneumonia?*

Pneumonia is scary. I routinely cover these patients with vanco. Is this necessary?

In most cases, the nose knows!



Paul Pottinger MD

CAP: Cover MRSA?



- Retrospective case series (88,605 CAP pts)
- 33,632 (38%) got MRSA coverage...
- 2% had clinical MRSA infection
- aRR vanco vs standard CAP treatment:
 - ✓ 30 day mortality: 1.4 [95% CI 1.3-1.5]
 - ✓ AKI: 1.4 [95% CI 1.3-1.5]
 - ✓ CDI: 1.6 [95% CI 1.3-1.9]
 - ✓ VRE: 1.6 [95% CI 1.0-2.3]
 - ✓ GNR infection: 1.5 [95% CI 1.2-1.8]

"These findings, which were robust to multiple methods of analysis, contribute to a growing body of evidence that raises questions surrounding widespread empirical use of extended-spectrum antibiotics in patients with community-acquired pneumonia."

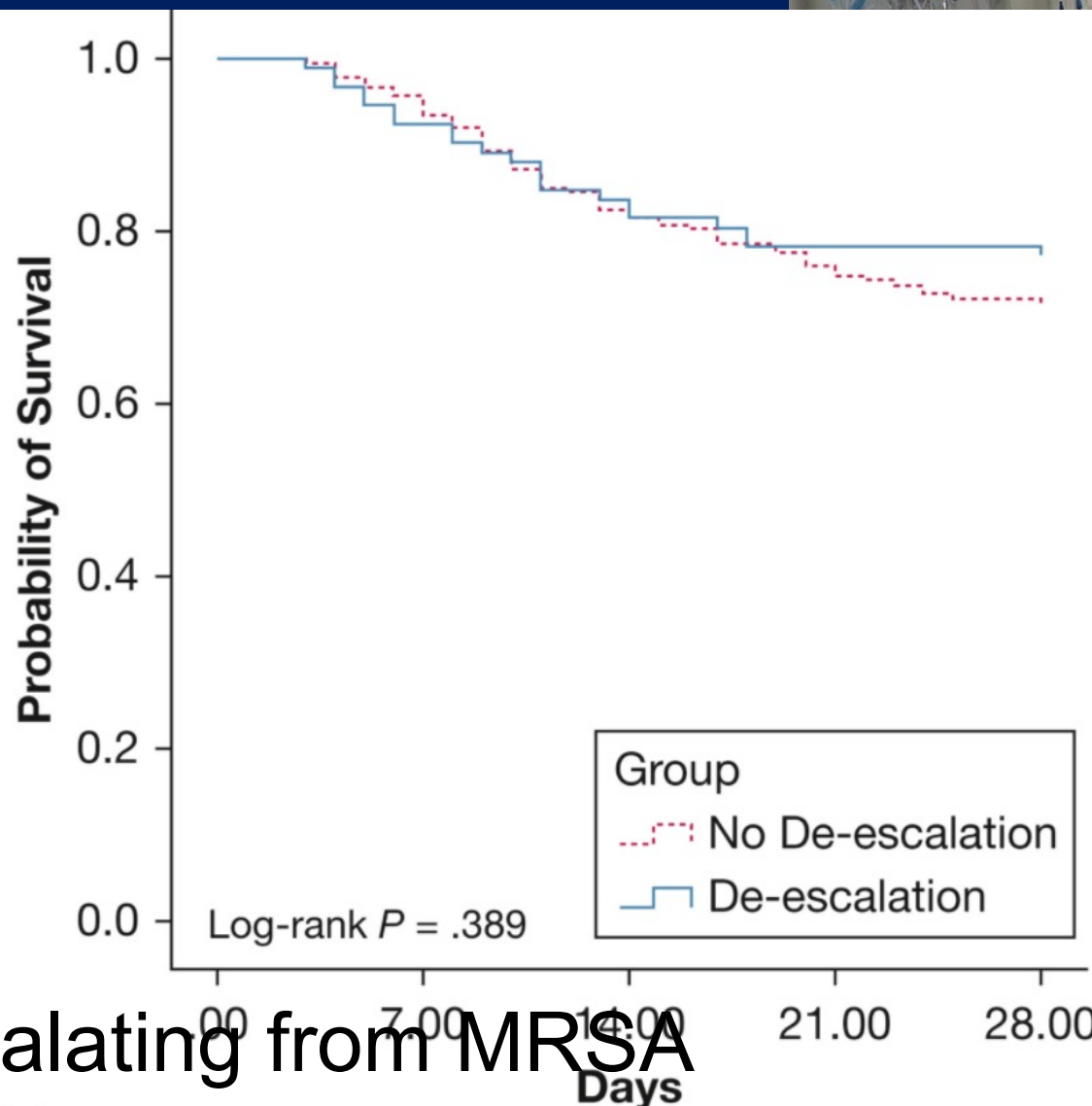


AKI rates vs standard O/A treatment.

- ✓ 30 day mortality: 1.4 [95% CI 1.3-1.5]
- ✓ AKI: 1.4 [95% CI 1.3-1.5]
- ✓ CDI: 1.6 [95% CI 1.3-1.9]
- ✓ VRE: 1.6 [95% CI 1.0-2.3]
- ✓ GNR infection: 1.5 [95% CI 1.2-1.8]

HAP: Cover MRSA?

- Retrospective case series (
- Culture negative HAP
- All got MRSA coverage... r
- 92 de-escalated off MRSA



- *Impression:* No harm in de-escalating from MRSA coverage (3 fewer days in ICU... 5 fewer days in hospital)

No. at Risk	0.00	7.00	14.00	21.00	28.00
De-escalation	92	85	77	72	71
No De-escalation	187	179	154	142	134

CAP & VAP: Cover for MRSA?

- Meta-Analysis (22 studies, 5163 pts)
- Nasal swab for MRSA c/w final micro diagnosis....

if 10% colonization

Infection	Sens	Spec	PPV	NPV
All Pneumonia	70.9%	90.3%	44.8%	96.5%
CAP	85%	92.1%	56.8%	98.1%
VAP	40.3%	93.7%	35.7%	94.8%

- *Impressions:* No MRSA in the nose? Very unlikely to be in the lungs... if in the nose, 30-50% chance it is deeper too!

Updates in ID: *MRSA Colonization*



Negative MRSA Nares and Other Infections

- Retrospective cohort study across the VA, 2007-2018
- Reviewed MRSA nares and cultures within 7-days

Type of Infection	No.	Sensitivity (95% CI), %	Specificity (95% CI), %	NPV, %
All	561,325	67 (67-68)	81 (81-81)	96.5
Blood	70,185	70 (69-71)	82 (81-82)	96.5
Intra-abdominal	11,906	66 (61-71)	89 (89-90)	98.6
Wound (UE)	2,867	63 (59-67)	85 (83-86)	88.3

CAP: Ambulatory Treatment



Table 3. Initial Treatment Strategies for Outpatients with Community-acquired Pneumonia

	Standard Regimen
No comorbidities or risk factors for MRSA or <i>Pseudomonas aeruginosa</i> [*]	Amoxicillin or doxycycline or macrolide (if local pneumococcal resistance is <25%) [†]
With comorbidities [‡] Comorbidities include chronic heart, lung, liver, or renal disease; diabetes mellitus; alcoholism; malignancy; or asplenia.	Combination therapy with amoxicillin/clavulanate or cephalosporin AND macrolide or doxycycline [§] OR monotherapy with respiratory fluoroquinolone .

CAP: *Inpatient Treatment, Not Severe*



Table 4. Initial Treatment Strategies for Inpatients with Community-acquired Pneumonia by Level of Severity and Risk for Drug Resistance

	Standard Regimen	Prior Respiratory Isolation of MRSA	Prior Respiratory Isolation of <i>Pseudomonas aeruginosa</i>	Recent Hospitalization and Parenteral Antibiotics and Locally Validated Risk Factors for MRSA	Recent Hospitalization and Parenteral Antibiotics and Locally Validated Risk Factors for <i>P. aeruginosa</i>
Nonsevere inpatient pneumonia*	β -Lactam + macrolide [†] or respiratory fluoroquinolone [‡]	Add MRSA coverage [§] and obtain cultures/nasal PCR to allow deescalation or confirmation of need for continued therapy	Add coverage for <i>P. aeruginosa</i> and obtain cultures to allow deescalation or confirmation of need for continued therapy	Obtain cultures but withhold MRSA coverage unless culture results are positive. If rapid nasal PCR is available, withhold additional empiric therapy against MRSA if rapid testing is negative or add coverage if PCR is positive and obtain cultures	Obtain cultures but initiate coverage for <i>P. aeruginosa</i> only if culture results are positive

CAP: Inpatient Treatment, Severe

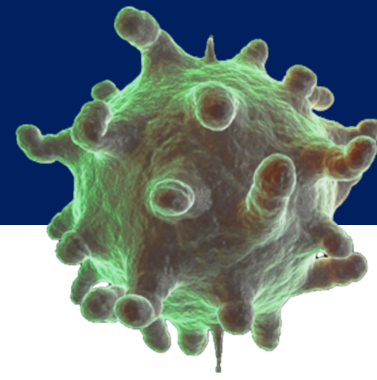


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Severe inpatient pneumonia*	β-Lactam + macrolide [†] or β-lactam + fluoroquinolone [‡]	Add MRSA coverage [§] and obtain cultures/nasal PCR to allow deescalation or confirmation of need for continued therapy	Add coverage for <i>P. aeruginosa</i> and obtain cultures to allow deescalation or confirmation of need for continued therapy	Add MRSA coverage [§] and obtain nasal PCR and cultures to allow deescalation or confirmation of need for continued therapy	Add coverage for <i>P. aeruginosa</i> and obtain cultures to allow deescalation or confirmation of need for continued therapy

Definition of abbreviations: ATS = American Thoracic Society; CAP = community-acquired pneumonia; HAP = hospital-acquired pneumonia; IDSA = Infectious Diseases Society of America; MRSA = methicillin-resistant *Staphylococcus aureus*; VAP = ventilator-associated pneumonia.

Antibiotics in 2022: *Rhinosinusitis*

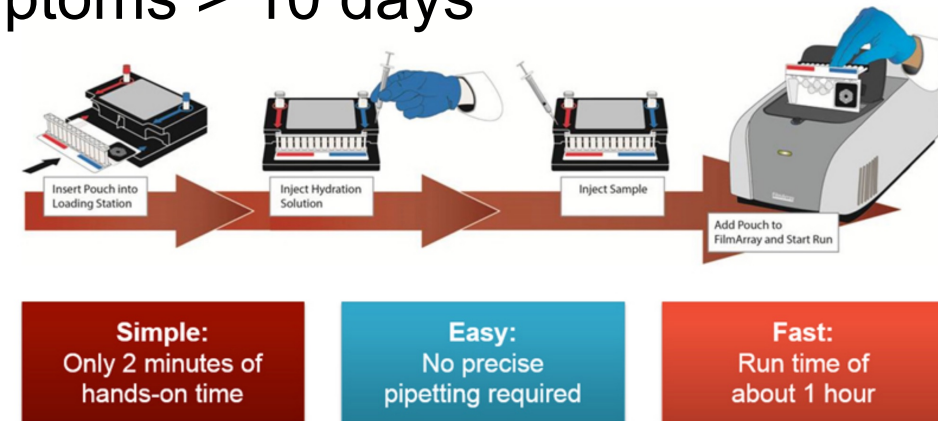


American adults have 2-3 / year

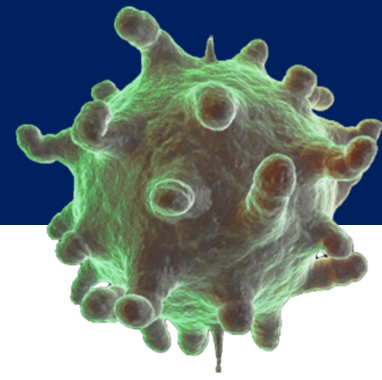
- ~98% viral (COVID-19, rhino, adeno, etc)
- 2% bacterial (*S.pneumo*, *H.flu*, *M.cat*)
- Symptomatic relief indicated **regardless** of cause
- No ironclad symptoms or signs distinguish between viral & bacterial etiologies
- Single best predictor of bacterial involvement: symptoms > 10 days
- Meta-Analysis: NNT = 15 (Young *Lancet* 2008)

Diagnostic uncertainty drives abx use!

- COVID-19 testing ubiquitous... if pts use it!
- Usually prohibitively expensive or unavailable
- Rapid detection of RSV and influenza A&B offered commercially...
1 hour turnaround time... cost ~\$100



Antibiotics in 2022: *Rhinosinusitis*



Pragmatic Approach...

- Validation: “Not COVID? OK. Other viruses going around too”
- Reassurance: “Good news, no abx needed!”
- Smoking cessation helps!
- Scheduled anti-inflammatory / analgesics.
- Judicious decongestants in *select* cases.
- Consider topical steroids if h/o allergy.
- Vitamin C: A fine way to acidify your urine.
- Appropriate hygiene and infection control!
- Neti-Pot... It’s what’s for rhinosinusitis!



Fluoroquinolone Alternatives: *Sinusitis*



1st Line Empiric Abx

- Amox-Clav 875-2000 mg PO BID x 5-7 Days

2nd Line Empiric Abx

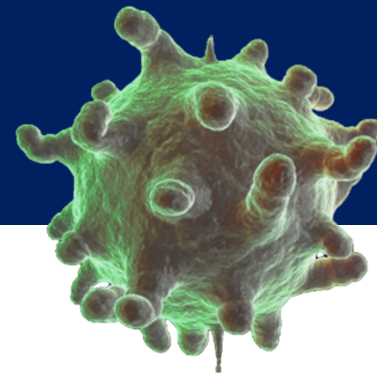
- Doxycycline 100 BID or
 - Levofloxacin 500 QD or
 - Moxifloxacin 400 QD
- } 5-7 Days

No Longer Recommended

- Azithromycin, TMP/SMX

*Modified IDSA
recommendations
soon...?*

Antibiotics in 2021: *Rhinosinusitis*



Why people swear by the neti pot

By Elizabeth Landau, CNN
April 15, 2010 8:59 a.m. EDT

This story started on  CNN iReport



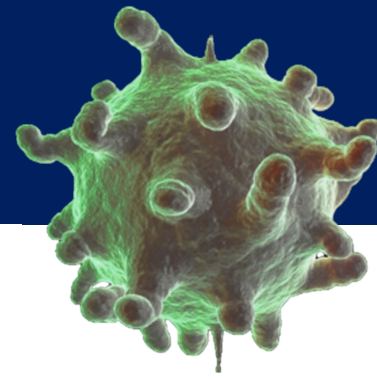
Elana Hersh felt sinus relief from a neti pot while

(CNN) -- "Saline irrigation" may not sound sexy, but Kelly Nance says she's hooked.

It's an unlikely activity to draw such a following. However, Nance and others like her have become devoted to the practice of flushing water through their nasal passages to help them breathe easier.

Although doctors have long known that a

Antibiotics in 2021: *Rhinosinusitis*

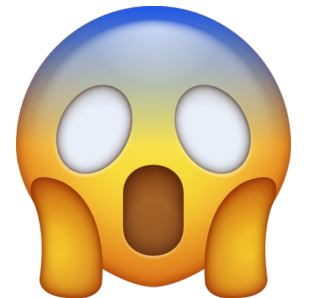
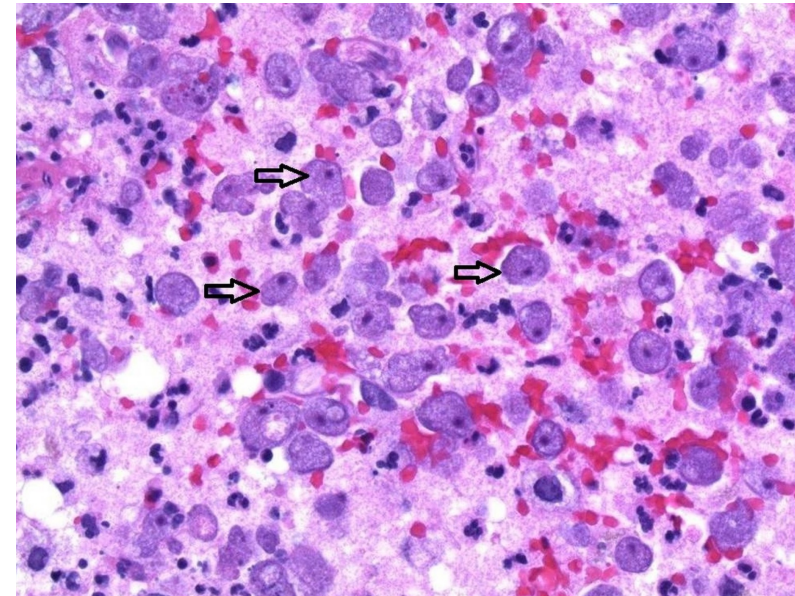
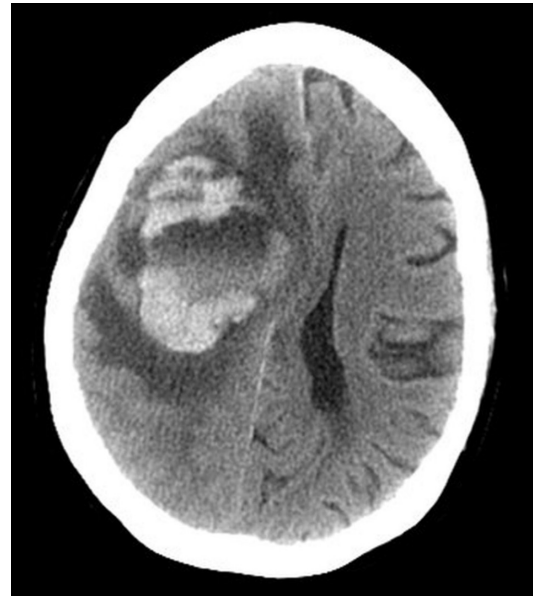


The Seattle Times

12/6/18

Rare brain-eating amoebas killed Seattle woman who rinsed her sinuses with tap water. Doctor warns this could happen again

Originally published December 6, 2018 at 6:00 am | Updated December 6, 2018 at 9:19 pm



Researchers said the amoebas likely got into the woman's brain through the tap water she used to fill a neti pot, rather than using saline or sterile water. The organisms entered her brain after she squirted the water up into her upper nasal cavity.

Recurrent Rhinosinusitis: *Risk Factors*

“What’s wrong with my immune system?”

- Beyond tobacco, probably nothing...
- If sino-pulmonary infections recur and ENT is out of ideas, consider ruling out:
 - ✓ Common Variable Immunodeficiency (check IgG level)
 - ✓ Cystic Fibrosis (pulmonary referral)



COPD: Abx for Prevention?

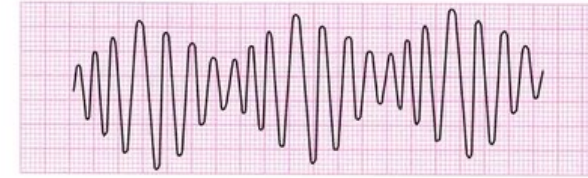
Synthesis

Ni et al, *PLoS One* 2015

- ✓ Meta-Analysis of 1,666 pts
- ✓ Weighted RR = 0.58, 95% CI: 0.43–0.78, $P < 0.01$
- ✓ AE: OR = 1.55, 95%CI: 1.003–2.39, $P = 0.049$
- ✓ “Our results suggest 6-12 months erythromycin or azithromycin therapy could effectively reduce the frequency of exacerbations in patients with COPD. However, long-term treatment may bring increased adverse events and the emergence of macrolide-resistance. A recommendation for the prophylactic use of macrolide therapy should weigh both the advantages and disadvantages.”



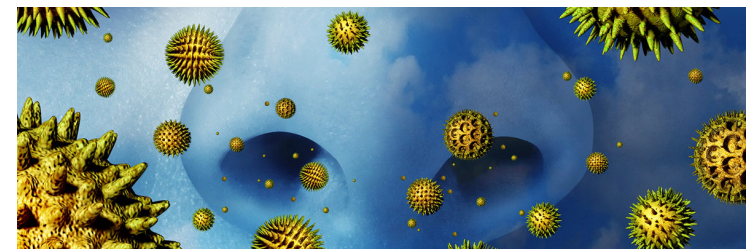
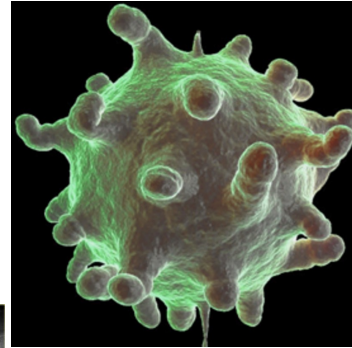
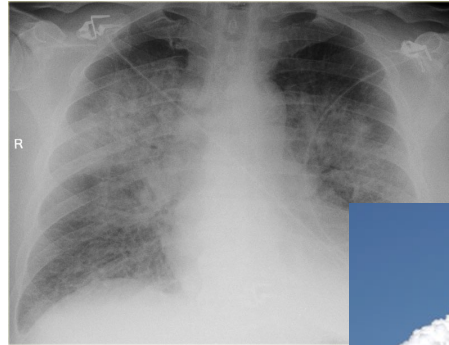
Torsade de Pointes



COPD: Abx for Treatment?

Exacerbation Triggers

- ✓ Bacterial Infection
- ✓ Viral Infection
- ✓ Smoke
- ✓ Allergens
- ✓ Pollutants
- ✓ Noncompliance
- ✓ Natural Progression
- ✓ Mimics (CHF)
- ✓ Procalcitonin endorsed by GOLD group



COPD: *Is This Bacterial*?



Common Presentations for ABECB

- ✓ Cough
- ✓ Fever
- ✓ Chest Pain
- ✓ Dyspnea
- ✓ Increased Sputum Production
- ✓ Increased Sputum Purulence

“Cardinal
Symptoms”
suggesting a
bacterial source

GOLD Recommendations

- ✓ Abx if all 3 present
- ✓ Abx if purulent sputum plus 1 other
- ✓ Abx if admitted and ventilated

COPD: How to Treat with Abx?

Ambulatory

- ✓ Amox-Clav 875mg PO BID or 500mg PO TID x 5 D
- ✓ Amox 500mg PO TID x 3-14 D
- ✓ Doxy 100mg PO BID x 3-14 D
- ✓ Cefuroxime 500mg PO BID x 10 D
- ✓ Azithro 500mg PO x 1 then 250mg PO QD x 4 D
- ✓ LVX or MOXI x 5 days

Admitted

Treat as for CAP

(ceftriaxone + [azithro or doxy]) x 5 D

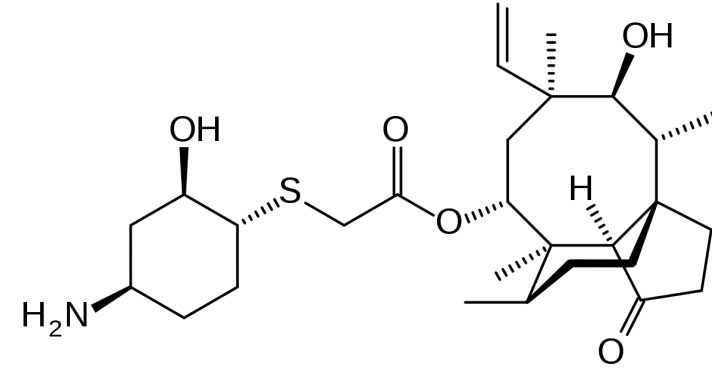


Antibiotic Update: *New Oral Pleuromutilin*



Lefamulin

- Novel Class: Pleuromutilin
- MOA: Protein synthesis blocker (50S)
- Approved for adults with CAP (no SSTI... yet)
 - ✓ *S.pneumoniae*
 - ✓ MSSA
 - ✓ *H.influenzae*
 - ✓ *Legionella pneumophila* & *Mycoplasma pneumoniae*
& *Chlamydophila pneumoniae*

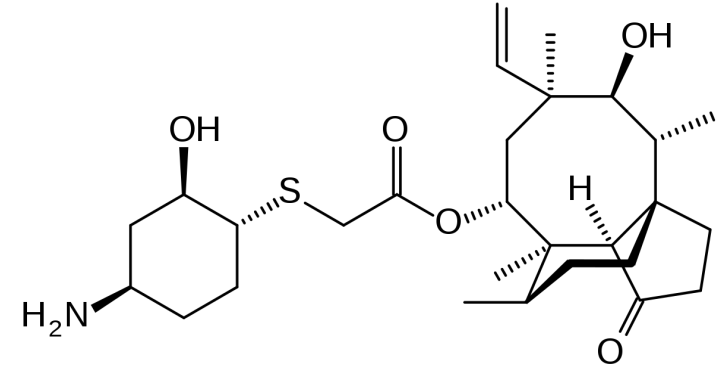


Antibiotic Update: *New Oral Pleuromutilin*

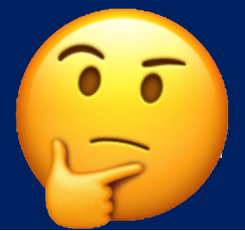


Lefamulin

- IV and PO formulations
- Dosing:
 - ✓ 150mg IV Q 12 H x 5-7 Days
 - ✓ 600mg PO Q 12 H x 5 Days
 - ✓ No adjustment for renal dysfunction

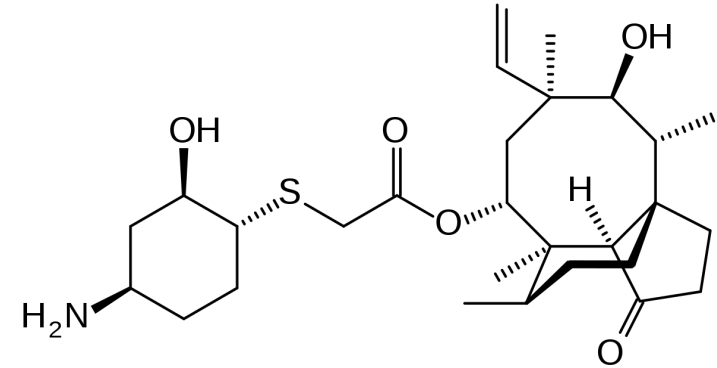


Antibiotic Update: *New Oral Pleuromutilin*



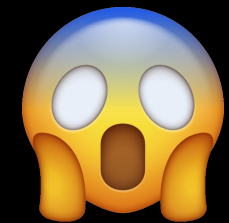
Lefamulin

- CYP3A4 substrate
- Adverse Events > 10%: Diarrhea
- Adverse Events 1-10%:
 - ✓ Hepatic enzyme elevation (2-3%)
 - ✓ Nausea (3-5%)
 - ✓ Hypokalemia (3%)
 - ✓ Insomnia (3%)
 - ✓ Vomiting (3%)
 - ✓ Headache (2%)



Cost

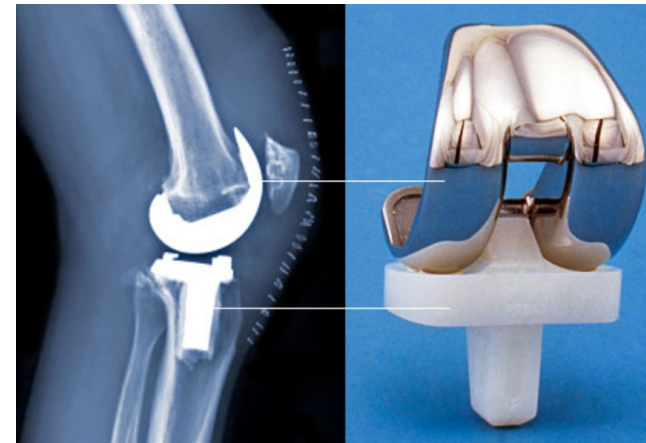
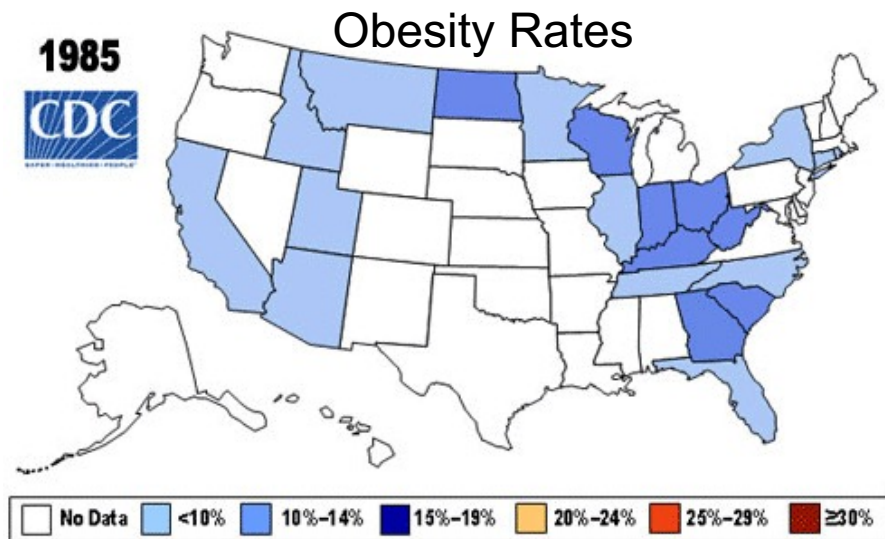
- ✓ IV: \$205 / day
- ✓ PO: \$275 / day
- ✓ Benefit coverage issues



Prosthetic Joint Infections: *A Big Problem*

“Very common operations”

- 1 million new hips & knees in USA annually
- Up to 4 million by 2030
- Leading indications: OA, RA, Trauma, Cancer
- Other joints “less popular” joints also on the rise (shoulder, elbow, fingers...)



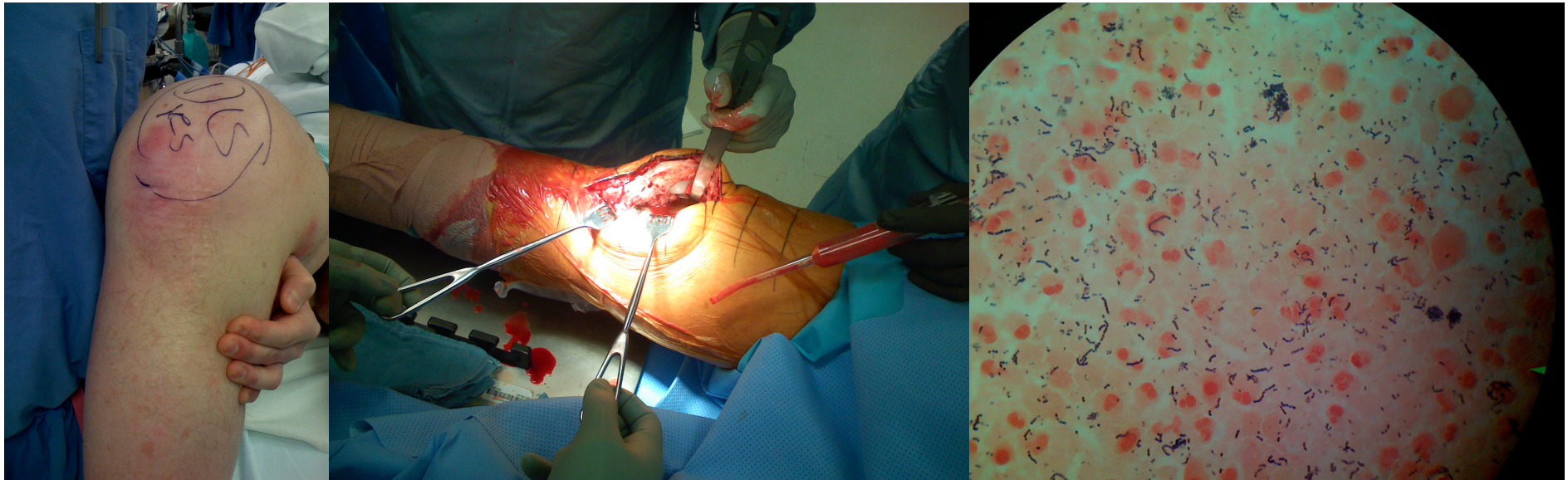
Kurtz *J Bone Joint Surg Am* 2007

Prosthetic Joint Infections: *A Big Problem*

“Infections super common too!”

- Lifetime incidence 0.5-2%... highest risk in first 2 years
- Risk: Knee > Hips
- Implications:
 - ✓ Pain, Suffering, Frustration, Joint dysfunction, Cost

Edwards *Am J Infect Control* 2009



Prosthetic Joint Infections: *(Almost) Never Oral*

What is the highest risk of bacteremia exposure?

Cumulative exposure measures CFU per minute per ml per year

Exposure Risk (Relative to tooth extraction)

Tooth extraction	1
Dental Exam	222
Mucoperiosteal surgery	5,555
Daily life	1,693,556
Flossing	365,000
Brushing teeth	702,556
Chewing	136,778
NT tube	166

**Current Guidelines
emphasize that
daily activities
incur highest risk,
not procedures.**

Prosthetic Joint Infections: *(Almost) Never Oral*

“Oral health... it’s a good thing”

- Many benefits to good dental care.
- Risk of PJI with oral flora is SMALL... very small.
- So small, that abx prophylaxis no longer recommended for routine dental care.
- Complicated, active periodontal dz may require abx (regardless of TJA).
- Analogy: Current endocarditis prevention guidelines.



American Dental Association guidance for utilizing appropriate use criteria in the management of the care of patients with orthopedic implants undergoing dental procedures

Approximately 332,000 primary total hip arthroplasties and 719,000 primary total knee arthroplasties were performed in the United States in 2010; 96% of hip replacement and 98% of knee replacement surgeries were performed on patients 45 years and older.¹ Reported infection rates for such operations range from 0.8% to 2.2%.²⁻⁴ Infections can be caused by introduction of microorganisms at the time of surgery, hematogenous seeding, or contiguous spread of infection from an adjacent site.^{2,3} Infections of total joint replacements can result in failure of the initial surgical procedure and the need for extensive revision, prolonged antibiotic treatment, functional impairment, considerable cost of care, and even death.

In 2014, the American Dental Association (ADA) Council on Scientific Affairs (CSA) assembled an expert panel to update and clarify the clinical recommendations found in a 2012 joint ADA and American Academy of Orthopaedic Surgeons (AAOS) evidence report and guideline.^{4,5} In accord with the 2012 ADA/AAOS evidence report, the updated ADA systematic review (published in the January 2015 issue of *The Journal of the American Dental Association*) found no statistically significant association between dental procedures and prosthetic joint infections (PJI). On the basis of the review of the evidence, the 2015 ADA Clinical Practice Guideline stated, “In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.”⁵

The ADA panel found no association between dental procedures and PJIs and no scientifically based efficacy for using antibiotics to prevent PJIs.⁷ The panel did acknowledge that there may be special circumstances in which a clinician may consider antibiotic prophylaxis despite the lack

CONCLUSIONS

“In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.”⁵ ■

<http://dx.doi.org/10.1016/j.adaj.2016.12.002>

Prosthetic Joint Infections: *(Almost) Never Oral*



Prosthetic Joint Infections: *(Almost) Never Oral*

“Appropriate Abx Use Criteria”

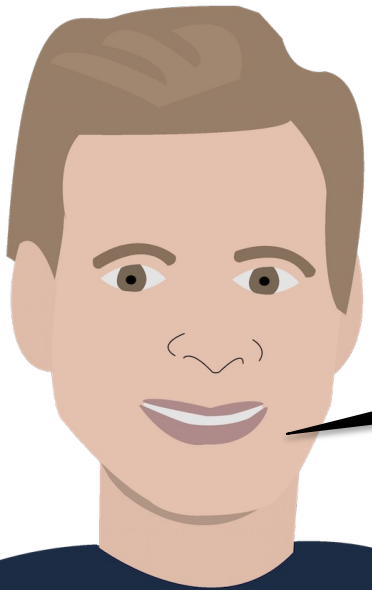
- Advanced AIDS.
- Chemotherapy.
- RA or other rheum dz on biologic DMARDs.
- Solid Organ Transplant recipient.
- Primary immunodeficiency.
- Stem cell transplant recipient (first 100 days).



Antibiotic Update: *Antibiotic Allergies*

My patients often say they are allergic to penicillin. I think they may be mistaken....
Can I figure this out in my office?

90% chance you are right! Oral amox challenge in the office can be safe!

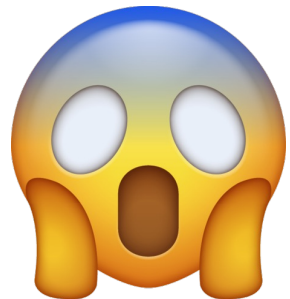


Paul Pottinger MD

Antibiotic Allergies: A *Hot Mess*

“I’m allergic to penicillin”

- 10% of Americans report a “penicillin allergy”
- **> 90% of these are bogus! (nausea, yeast infxn....)**
- **Beta-lactams are generally safe, effective, well-tolerated**
- **50% increase in surgical site infections and adverse reactions with second-line abx (vanco alone, clinda, FQ)**



Antibiotic Allergies: *Opportunity!*

“History is key”

- **WHAT?** (Airway? Intubation? Itching? “Hives” used differently by folks)
- **WHEN?** (Relation to dose? >10 years ago?)
- **WHO?** (Witnessed, recorded, historical?)
- Beware shibboleths in the **EMR!**
- Patient need elective surgery? Often on abx? You have time to **get this right!**
- Start thinking about abx allergies **before** they are needed



Antibiotic Allergies: *Options*

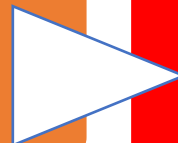
- > 1 Year Ago
- Benign Rash
- GI upset
- Other benign issue
- Unknown Hx



Oral amoxicillin challenge

(very safe, > 95% have no reaction!)

- Within last year
- Airway / Anaphylaxis
- Pt or Provider Preference



Skin Testing





Evaluating Penicillin Allergies Without Skin Testing

Taylor A. Banks¹ · Mark Tucker² · Eric Macy³

Published online: 22 May 2019
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Clinical Communications

Abstract

Purpose of Review Patients labeled with amoxicillin therapy acute challenge re- Unfortunately, pen- Recent Findings E challenge, would b ultimately increase direct oral amoxici risk individuals, th 6 h of the first dose using commercial Summary Direct o penicillin allergy d

Amoxicillin challenge without penicillin skin testing in evaluation of penicillin allergy in a cohort of Marine recruits

Mark H. Tucker, MD^a, Chad M. Lomas, MD^b, Nanda Ramchandrar, MD^c, and Jeremy D. Waldram, MD^a

Clinical implications

- Most penicillin individuals with

Original Investigation

Assessing the Diagnostic Properties of a Graded Provocation Challenge for the Diagnosis of Immediate and Nonimmediate Reactions to Amoxicillin in Children

Christopher Mill, MPH; Marie-Noël Primeau, MD; Elaine Medoff, MD; Christine Lejtenyi, MD; Andrew O'Keefe, MD; Elena Netchiporouk, MD; Alizee Dery, BSc; Moshe Ben-Shoshan, MD, MSc

IMPORTANCE The diagnostic properties of a graded provocation challenge (PC) among children presenting with a rash in the course of amoxicillin treatment are currently unknown.

OBJECTIVE To assess the accuracy and the negative predictive value of the PC in a cohort of children referred with suspected allergy to amoxicillin.

DESIGN, SETTING, AND PARTICIPANTS A cohort study was conducted between March 1, 2012, and April 1, 2015, at the allergy clinic of the Montreal Children's Hospital, Montreal, Quebec, Canada. All children referred with suspected allergy to amoxicillin were approached. In addition, 346 eligible children were followed up to assess reactions to subsequent use of amoxicillin at the time of illness in cases with negative PC results. Data were collected on clinical characteristics, suspected antibiotic exposure, personal and first-degree relatives' comorbidities, and history of atopy and management of the reaction. Univariate and multivariate logistic regressions were compared to determine factors associated with immediate and nonimmediate reactions to the PC.

Keywords Adverse reactions to amoxicillin · Hypersensitivity

TO THE EDITOR: Penicillin is the most commonly used antibiotic in the world. It increases length of stay and reporting. Penicillin allergy is a common diagnosis. Marine recruits undergo basic training annually at



results,^{7,8} and that oral challenge alone may be a suitable method of evaluation, particularly in patients who had nonimmediate cutaneous reactions.⁹

Many of the Marine recruits arriving at MCRD between July 2014 and March 2016 were evaluated by an allergist stationed at MCRD if they reported PCN or cephalosporin allergy. PCN allergy evaluation took place only if the recruit training schedule permitted and the allergist on site was available. Of the recruit companies screened, there was approximately a 5% self-reporting

Original Article

Oral Challenge without Skin Testing Safely Excludes Clinically Significant Delayed-Onset Penicillin Hypersensitivity



Ronit Confino-Cohen, MD^{a,b}, Yossi Rosman, MD^{a,b}, Keren Meir-Shafir, MD^a, Tali Stauber, MD^{a,b}, Idit Lachover-Roth, MD^{a,b}, Alon Hershko, MD^{a,b}, and Arnon Goldberg, MD^{a,b} *Kfar-Saba and Tel-Aviv, Israel*

Original Article

Safety and Outcomes of Oral Graded Challenges to Amoxicillin without Prior Skin Testing

Melissa Iammatteo, MD^a, Santiago Alvarez Arango, MD^b, Denisa Ferastraoaru, MD^a, Nadeem Akbar, MD^c, Andrew Y. Lee, MD^c, Hillel W. Cohen, DrPH^d, and Elina Jerschow, MD, MSc^a *Bronx, NY; and Baltimore, Md*

What is already known about this topic? Reactions. Current guidelines recommend re-administering nonimmediate reactions to amoxicillin within 1 hour after a negative skin test.

What does this study add? Found no relative risk of reactions to amoxicillin within 1 hour after a negative skin test.

How does this study change current practice? Safe and sufficient to rule out a high risk of having anaphylaxis during a confirmatory oral amoxicillin challenge.

BACKGROUND Commonly associated with amoxicillin treatment. Guidelines recommend re-administering nonimmediate reactions to amoxicillin within 1 hour after a negative skin test. **OBJECTIVE** To assess whether skin testing (ST) is necessary in patients with nonimmediate reactions to amoxicillin. **METHODS** Patients with a rash within 1 hour after amoxicillin challenge were included. **RESULTS** Editorial and peer-reviewed. **CONCLUSIONS** Amoxicillin challenge is safe and sufficient to rule out a high risk of having anaphylaxis during a confirmatory oral amoxicillin challenge.

CME Review

Who needs penicillin allergy testing?

Eric Macy, MD, MS¹; David Vyles, DO, MS²

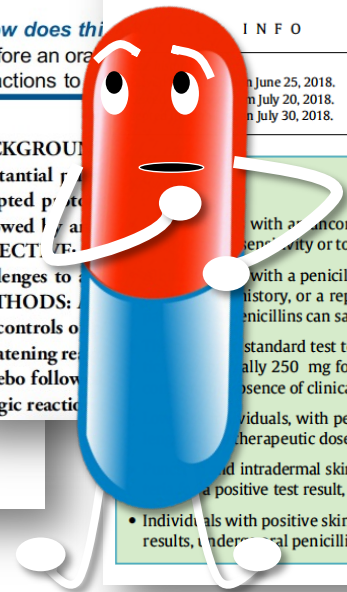
¹ Department of Allergy, Southern California Permanente Medical Group, San Diego Medical Center, San Diego, California
² Pediatric Emergency Medicine, Medical College of Wisconsin, Milwaukee, Wisconsin

What is already known about this topic? Most widely accepted practice is to challenge patients with a confirmed penicillin allergy should have their penicillin allergy evaluated and, if appropriate, tested to confirm sensitivity or tolerance.

What does this study add? to amoxicillin challenge. Individuals with a penicillin-associated history of anaphylaxis, rash, gastrointestinal symptoms, headaches, other low-risk symptoms, history, or a reported family history of penicillin allergy can undergo testing to confirm current tolerance and convince the clinician that amoxicillin can safely be used.

How does this study change current practice? before an oral challenge. Individuals with a penicillin-associated history of anaphylaxis, rash, gastrointestinal symptoms, headaches, other low-risk symptoms, history, or a reported family history of penicillin allergy can undergo testing to confirm current tolerance and convince the clinician that amoxicillin can safely be used.

BACKGROUND A substantial proportion of patients with a confirmed penicillin allergy should have their penicillin allergy evaluated and, if appropriate, tested to confirm sensitivity or tolerance. **OBJECTIVE** To assess whether skin testing (ST) is necessary in patients with nonimmediate reactions to amoxicillin. **METHODS** Patients with a rash within 1 hour after amoxicillin challenge were included. **RESULTS** Editorial and peer-reviewed. **CONCLUSIONS** Amoxicillin challenge is safe and sufficient to rule out a high risk of having anaphylaxis during a confirmatory oral amoxicillin challenge.



“Got Antibiotic Allergies? There’s an App for That!”

University of Washington Team PAL-ergy



Vidya Atluri, MD-PhD
Senior ID Fellow
Infectious Diseases



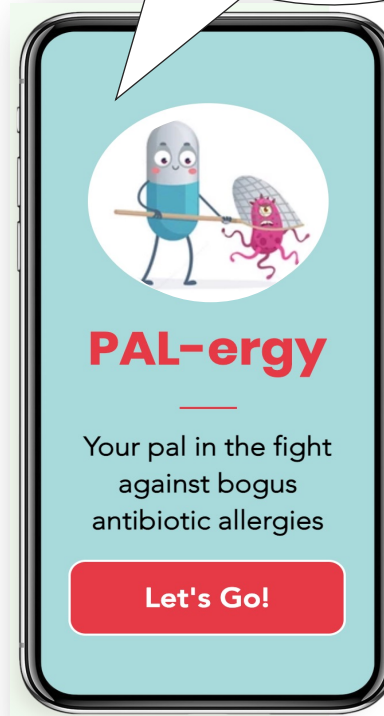
Paul Pottinger, MD
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Infectious Diseases



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Try Me!



Ania Lang, MD-PhD
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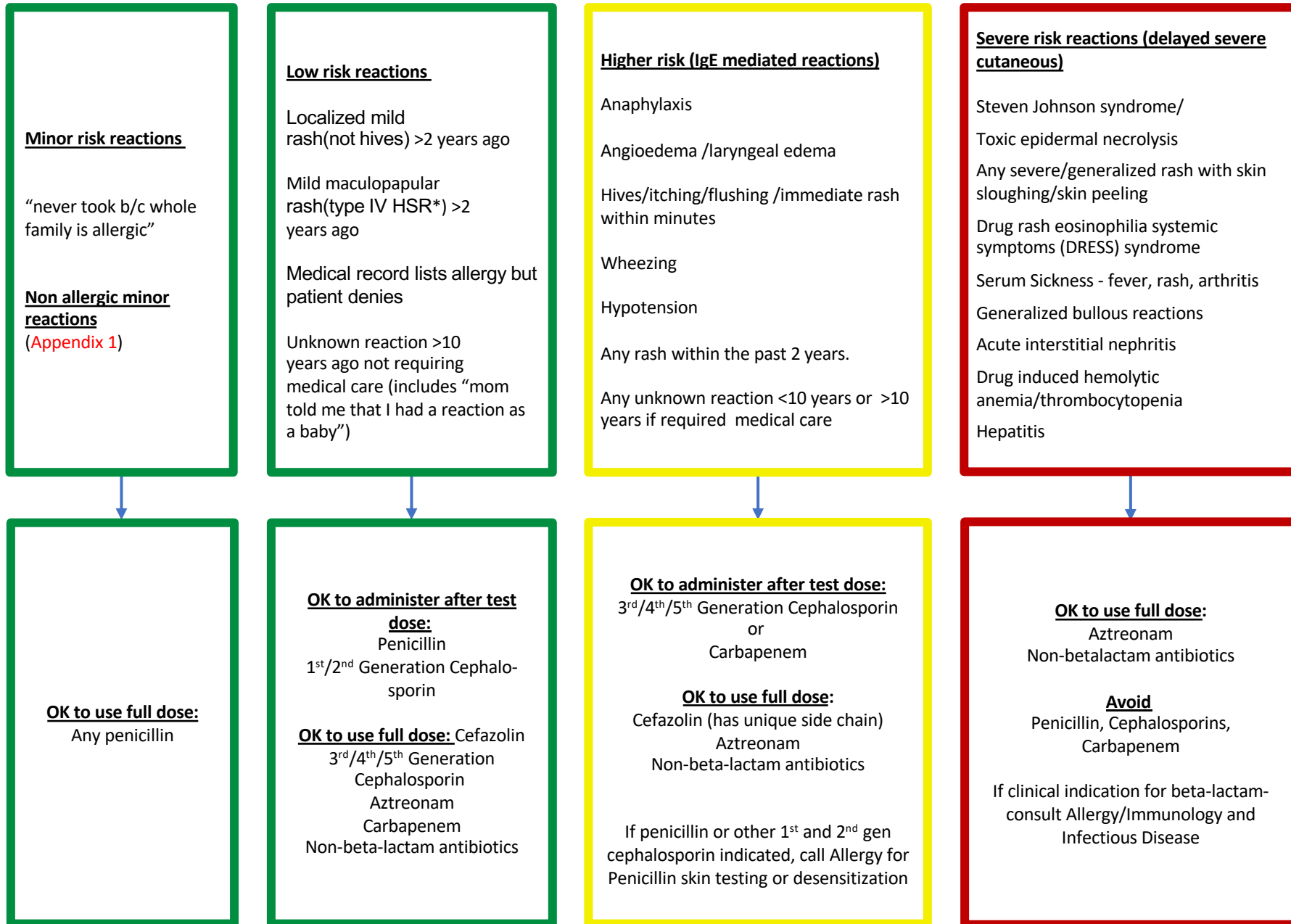


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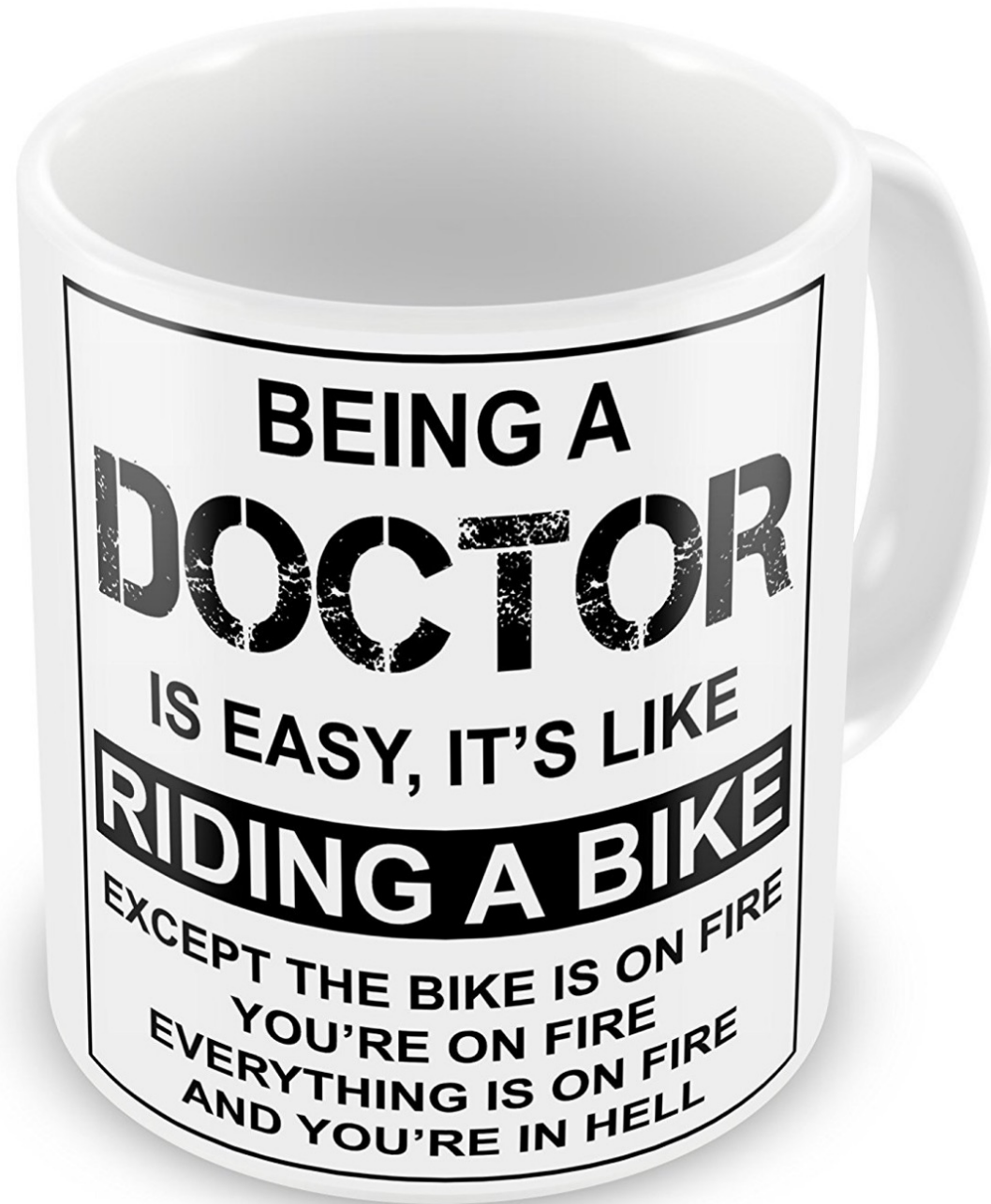


David T. Coleman, MD
Assistant Professor
Allergy / Immunology
U Michigan

Assessment of Patient Reported Penicillin Allergy



*HSR: Hypersensitivity reaction. See Appendix 4 for test dose procedure. Cefazolin in Penicillin allergy - see reference 13 and 14.



BEING A
DOCTOR

IS EASY, IT'S LIKE

RIDING A BIKE

EXCEPT THE BIKE IS ON FIRE
YOU'RE ON FIRE
EVERYTHING IS ON FIRE
AND YOU'RE IN HELL

Antibiotic Update: *Conclusions*

- Abx use: Nationwide variability... we tend to prescribe too much coverage, too often, for too long.
- SSTI: Purulent usually S.aureus (drain +/- coverage), cellulitis usually Strep (beta-lactam when possible).
- CAP: Usually 5 days, beta-lactam backbone when possible
- Lefamulin: New class for CAP... beware GI... beware \$
- COPD: Flares often non-infectious, but use GOLD criteria
- Prosthetic Joints: Usually do not require abx prophylaxis for dental procedures
- Abx "allergy:" Test less, talk more! Consider our free online app... and consider amox challenge if hx low risk

Truly... Thank You



Paul Pottinger MD

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