UWTASP tele-antimicrobial stewardship program | echo

May 16, 2017

Robert Cybulski, PhD
Marisa D'Angeli, MD
Zahra Escobar, PharmD, BCPS
Natalia Martinez-Paz, MPA, MA
John Lynch, MD, MPH
Paul Pottinger, MD

Agenda

- Didactic: *Penicillin Allergy*
- Cases

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Penicillin Allergy

with thanks to Dr. Bob Pelz

John Lynch, MD, MPH
Harborview Medical Center &
The University of Washington

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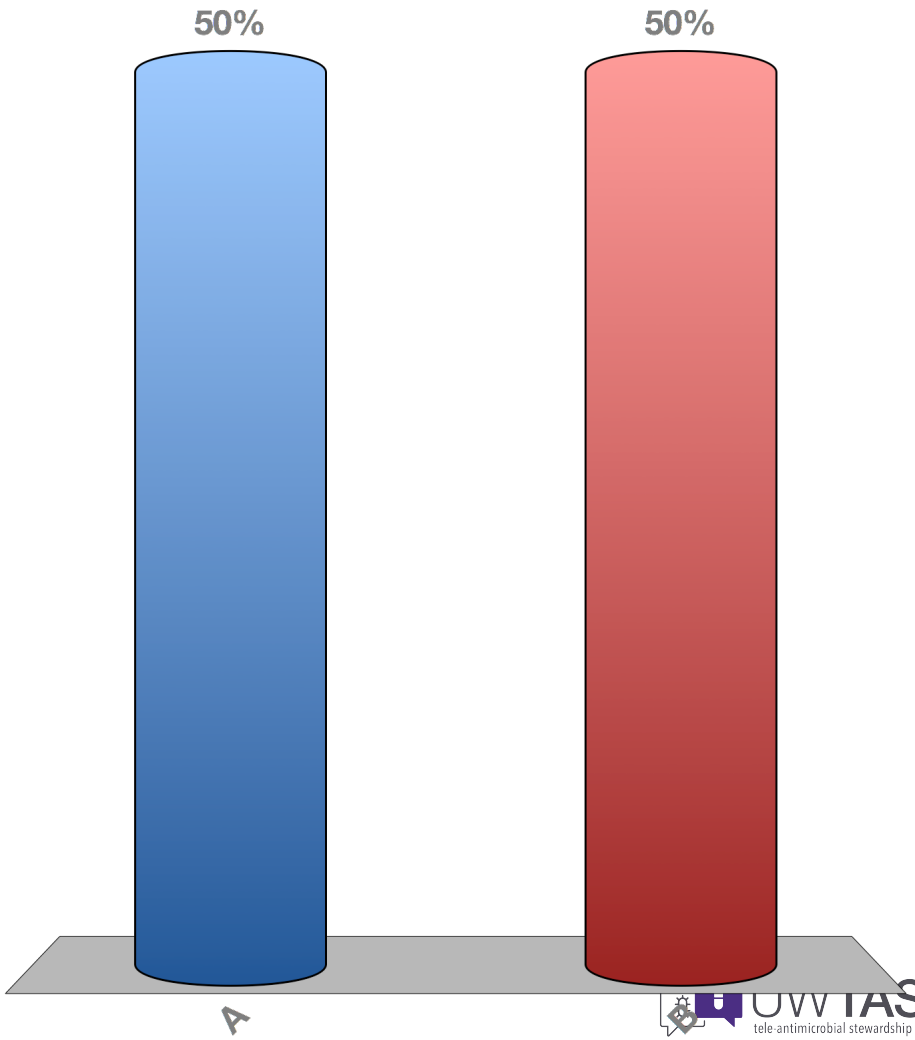
Have you been told that someone has a penicillin allergy?

A. Yes
B. No



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“Penicillin Allergy”

- True prevalence of penicillin allergy is ~1%
- 10-15% of inpatients and 9-12% of outpatients report an allergy
- 90% of the above are not allergic and of those who were, most are no longer
- Why so much confusion?
  - Allergenic impurities in penicillin in ’70s
  - Penicillin contamination of cephalosporins pre-1980

Why is This a Problem?

- Removes options for effective treatment
- Increases resistance and *C. difficile* disease as clinicians reach for vancomycin and fluoroquinolones
- At some sites, most vancomycin use due to reported allergy
- May require multiple antimicrobials to substitute

Why is This a Problem?

Inferior patient outcomes

- Adverse effects
- Risk of drug resistance
- *C. difficile* infection

Increased costs

- 40% higher antibiotic cost
- Increased length of stay

Outcomes w/ MSSA

	All	Reported Penicillin Allergy	No Reported Penicillin Allergy	P Value*
Primary Outcome	(n = 456)	(n = 59)	(n = 397)	
Optimal Therapy Trial, n (%)	346 (76)	28 (47)	318 (80)	<0.001
	All	Reported Penicillin Allergy	No Reported Penicillin Allergy	P Value*
Secondary Outcome	(n = 440)	(n = 57)	(n = 383)	
Adequate Therapy Completion, n (%)	391 (89) †	48 (84)	343 (90)	0.26
Predominantly first-line therapy	302 (77)	26 (54)	276 (80)	<0.001‡
Predominantly second line therapy	50 (13)	19 (40)	31 (9)	
Combination of first-line and second-line therapies	39 (10)	3 (6)	36 (11)	

* Wilcoxon rank-sum or Fisher's exact test unless specified

† Of the 49 patients not receiving adequate therapy, 33 were discharged within 10 days without adequate therapy to complete their course, 16 were hospitalized for at least 10 days and not treated with adequate antibiotic therapy for MSSA bacteremia.

‡ Cochran-Armitage trend test

doi:10.1371/journal.pone.0159406.t002

- Hazard for mortality 0.57 for vanco vs beta-lactam for MSSA (McDaniel, CID, 2015)
- Recurrence higher for vanco (20% vs 4%) (Change, Medicine, 2003)

Blumenthal, PLoS, 2016

Outcomes w/ MSSA

Table 1. Summary of Published Studies Evaluating Empirical Therapy for Methicillin-Susceptible *Staphylococcus aureus* Bacteremia

Study	Year	Design	Study Size, No.	Outcome	Vancomycin vs β-Lactam	Result[a]
Vancomycin therapy vs β-lactam therapy[b]						
Chang et al [19]	2003	Prospective cohort	505	Bacteriologic failure[c]	19% vs 0%	OR, 6.5 (1.0–53)
Khatib et al [20]	2006	Prospective cohort	120	Overall mortality	27% vs 12%	HR, 2.3 (1.1–4.9)
Stryjewski et al [21][d]	2007	Prospective cohort	123	Treatment failure	31% vs 13%	OR, 3.5 (1.2–13)
Lodise et al [6][e]	2007	Retrospective cohort	84	Infection-related mortality	39% vs 11%	OR, 6.5 (1.4–29)
Kim et al [22]	2008	Retrospective case-control	27	Infection-related mortality	37% vs 11%	OR, 3.3 (1.2–9.5)
Schweizer et al [23]	2011	Retrospective	267	30-day in-hospital mortality	20% vs 3%	HR, 4.8 (2.1–11)[f]
Chan et al [24]	2012	Retrospective cohort	293 094	Hospitalization rate	12.5 vs 7.2[g]	HR, 1.6 (1.2–2.2)[f]
Vancomycin therapy vs vancomycin therapy de-escalated to β-lactam						
Lodise et al [6][e]	2007	Retrospective cohort	84	Infection-related mortality	33% vs 41%	NS
Schweizer et al [23]	2011	Retrospective cohort	267	30-day in-hospital mortality	20% vs 7%	HR, 3.2 (1–10)
Vancomycin therapy de-escalated to β-lactam therapy vs β-lactam therapy						
Khatib et al [25]	2006	Prospective cohort	168	Persistent bacteremia	56% vs 37%	$P = .03$
Lodise et al [6][e]	2007	Retrospective cohort	84	Infection-related mortality	41% vs 11%	Not reported

McDaniel, CID, 2015

2014 Kaiser California Study

- Allergic patients had 0.59 day longer LOS, 23.4% more C. diff, 14% more MRSA, 30% more VRE
- Estimated cost increase: $64 million/ 3yr
- More vancomycin, fluoroquinolones, clindamycin

Macy, J Allergy Clin Immuno, 2014

Barriers

- Easier for busy clinicians to order alternative antibiotics
- Lack of knowledge and exaggerated risk perception (patients and providers)
- ID and IM docs not trained
- Missed opportunity for emphasis in ID and ASPs

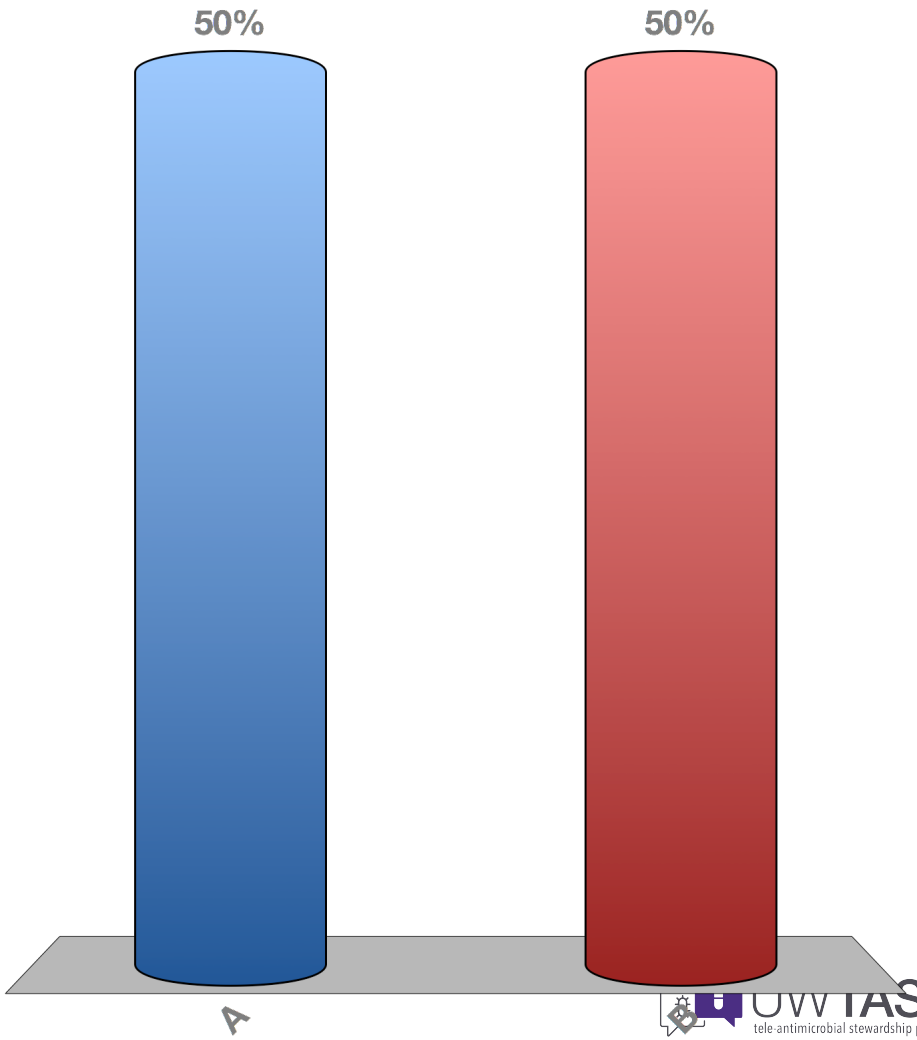
Dr. Bob Pelz, WSHA ASP, September 2016

Strategies

- Ask patient if PCN or ceph tolerated since allergy. If yes, OK to use.
- If not an allergy (ex. nausea), OK to use
- OK to use cephalosporin is allergy is no anaphylaxis, SJS, TEN, etc.
- PCN testing
- Graded challenge, desensitization

Does your facility have a process for skin testing patients with a reported allergy to penicillin?

A. Yes
B. No



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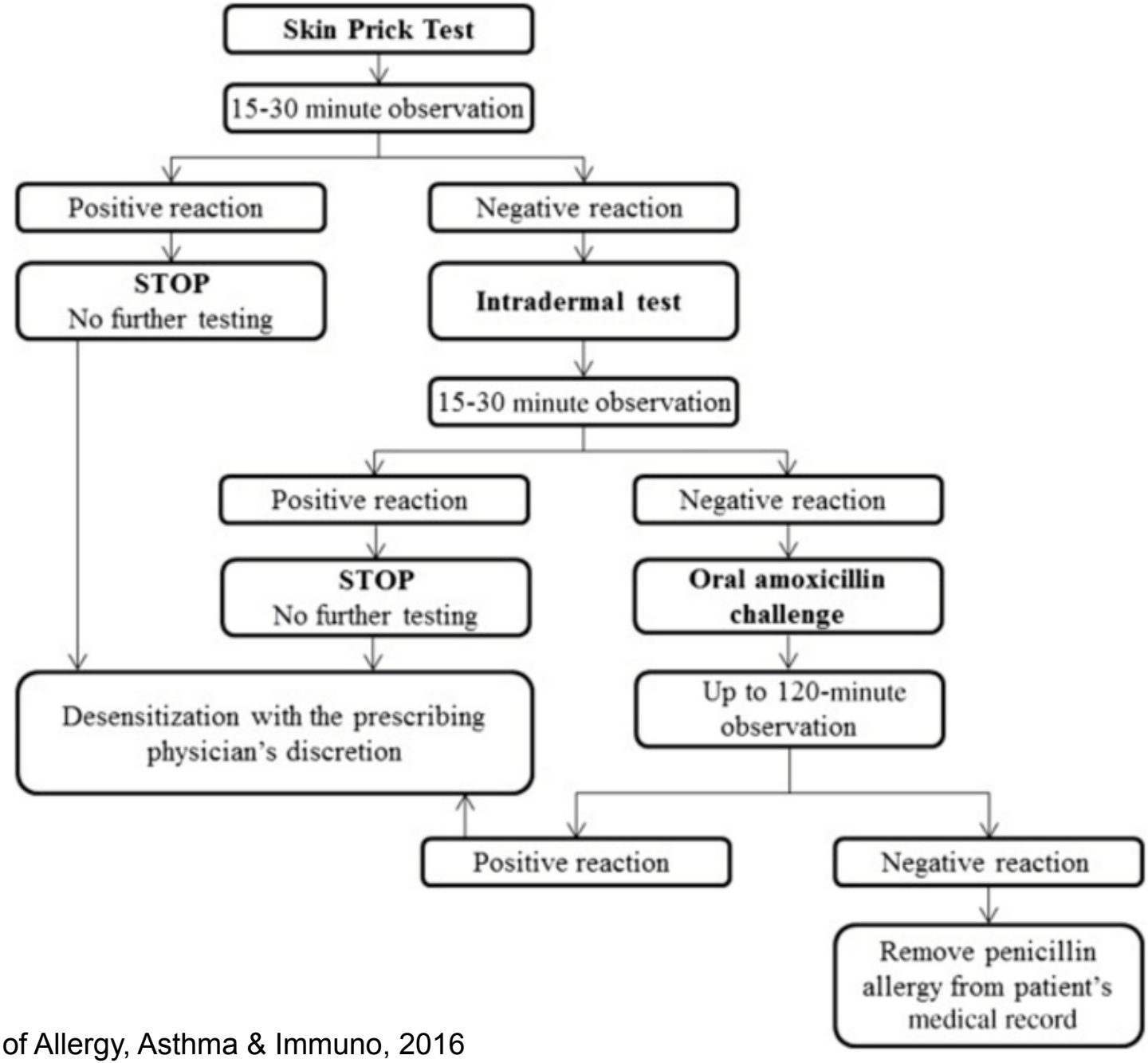
Penicillin Skin Testing (PST) I

- Identifies only Type I, IgE-mediated allergy
  - Benzylpenicilloyl polylysine
  - Urticaria, anaphylaxis, bronchospasm, angioedema
  - Usually within 1 hour of dose
- No antihistamines
- DO NOT skin test patients with h/o non-IgE allergy (TEN/SJS, DRESS, AIN, hemolysis, etc)
- Can be RN or pharmacist driven



King, Annals of Allergy, Asthma & Immuno, 2016

Penicillin Skin Testing II

- Pretest probability of not having an allergy is ~90%
- NPV of negative test is >99% (better than general population)
- Up to 3% of allergic pts missed with testing but can be safely identified with oral challenge
- **PST programs = cost savings + improved patient outcomes**

References and Reading

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