

# Impact of Pharmacist Driven Penicillin Skin Testing on Antimicrobial Stewardship Practices

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## Disclosure

- ▶ I have no financial or nonfinancial conflicts of interest regarding the subject matter of this presentation.

## Objective

- ▶ Identify the clinical interventions that a pharmacist is able to make after completing a penicillin skin test

## Overview

- ▶ Background
- ▶ Administrative Process/Implementation
- ▶ Methods/Testing
- ▶ Results
- ▶ Challenges
- ▶ Future Directions

## Background

- ▶ 10% of patients report an allergy to penicillin<sup>6</sup>
- ▶ 95% of these patients likely tolerant to penicillins and cephalosporins<sup>2</sup>
- ▶ Studies have shown unclarified or inaccurate penicillin allergies leads to
  - ▶ Higher post-operative SSI rates
  - ▶ Worse clinical outcomes for certain types of infections and disease states
  - ▶ Increased rates of C. diff, MRSA, and VRE in patients with recorded penicillin allergies

## Rationale for Implementation

- ▶ "In patients with a history of beta-lactam allergy, we suggest that ASPs promote allergy assessments and penicillin (PCN) skin testing when appropriate"

IDSA Implementing an Antibiotic Stewardship Program Guidelines<sup>1</sup>

## Administrative Process

- ▶ Pharmacist Penicillin Skin Test Protocol → Approved through P&T
  - ▶ Engage stakeholders (Allergist, MDs, RNs)
  - ▶ Educate MDs, RNs (Procedure, Reactions, Results)
- ▶ Patient Consent Form → Approved through Forms Committee
- ▶ Acquire Supplies
  - ▶ Develop system for compounding penicillin dilution
  - ▶ Determine cost/benefit of kits
  - ▶ Pre-pen
- ▶ Develop system for documentation in hospital's EMR
- ▶ Incorporate penicillin skin testing into pharmacist workflow

**\*Before starting, ensure that consent form has been discussed, signed, and filed in chart**

- 1) Skin Prick Test (Document administration in EMAR)
  - a. Pre-pen x1
  - b. Pen G dilution
  - c. Saline
  - d. Histamine

WAIT 15 MINUTES TO READ

**Positive control (histamine) ≥5mm AND**

**Negative control (saline) <3mm AND**

**Antigen (Pen/Pre-pen) <3mm**

Continue to step 2

**Antigen ≥3mm**

**ALLERGIC, DO NOT CONTINUE TEST** ⚠

Document in note, notify physician and update allergy profile

**Negative Control ≥3mm**

Repeat, or contact Allergy MD for advice ⚠

- 2) Intradermal Test (Document administration in EMAR)
  - a. Pre-pen x 2
  - b. Pen G x 2
  - c. Normal Saline x 1

WAIT 15 MINUTES TO READ

**Negative test: <3mm difference between saline and antigens**

Continue to step 3

**Positive ≥3mm difference between saline and antigens**

**ALLERGIC, DO NOT CONTINUE TEST** ⚠

Document PCS note, inform physician that allergy is confirmed, update comments on allergy to include confirmed by PCN skin test.

## Results

Patients Tested	N=32
Skin Test+Oral/IV Challenge Negative	26
Scratch Test Positive	1
Indeterminate Test (lack of histamine response)	3*

**TEST RESULTS**

- Negative Test
- Positive Test

\*All of these patients had taken antihistamines recently  
Average time from last antihistamine dose: 15 hours [1-32]  
Patients who took antihistamine prior to testing: 10

## Results, cont..

**RECOMMENDATIONS FOR DE-ESCALATION**  
N=15

▶ **Examples of interventions:**

- ▶ Meropenem + clindamycin → Unasyn for facial abscess
- ▶ Ertapenem + Azithromycin → Ceftriaxone + azithromycin for CAP
- ▶ Prevented use of daptomycin for staphylococcal coverage in cellulitis

## Results, cont.

- ▶ Overall cost to patients ~\$200
- ▶ Lumped into DRG

Antimicrobial Therapy	Days of Therapy	Total Costs Accrued by Patients	Average Antimicrobial Cost/Day
Prior to skin test	51	\$9552.16	\$187.30
After negative skin test	49	\$5514.75	\$112.55

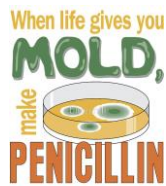
## Challenges

- ▶ Penicillin Dilution
  - ▶ Train technicians and incorporate into IV batching schedule
- ▶ Training
  - ▶ Train under allergist
  - ▶ Find core group of individuals who will be trained
- ▶ Duration of test
  - ▶ ~2-3 hours
- ▶ **WORKFLOW**

## Future Development

- ▶ Add PCN skin testing to the following areas:
  - ▶ Pre-operative patient care
  - ▶ Ambulatory care
  - ▶ ER
- ▶ Cephalosporin skin testing

## Questions?



## References

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