

Challenges in Making the Case for De-labeling Penicillin Allergy Status in the Primary Care Setting

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Introduction

About 10% of the US population carries a penicillin (PCN) allergy label.

Most of these are non-immunologic or outgrown mild-to-moderate type 1 reactions.

Primary care physicians are uniquely equipped to meet the mismatch between patient volume and resources to address this care gap.

Our project seeks to characterize the “business” components that challenge the case for primary care to address these problems.

Penicillin (PCN) Allergies: Total Population

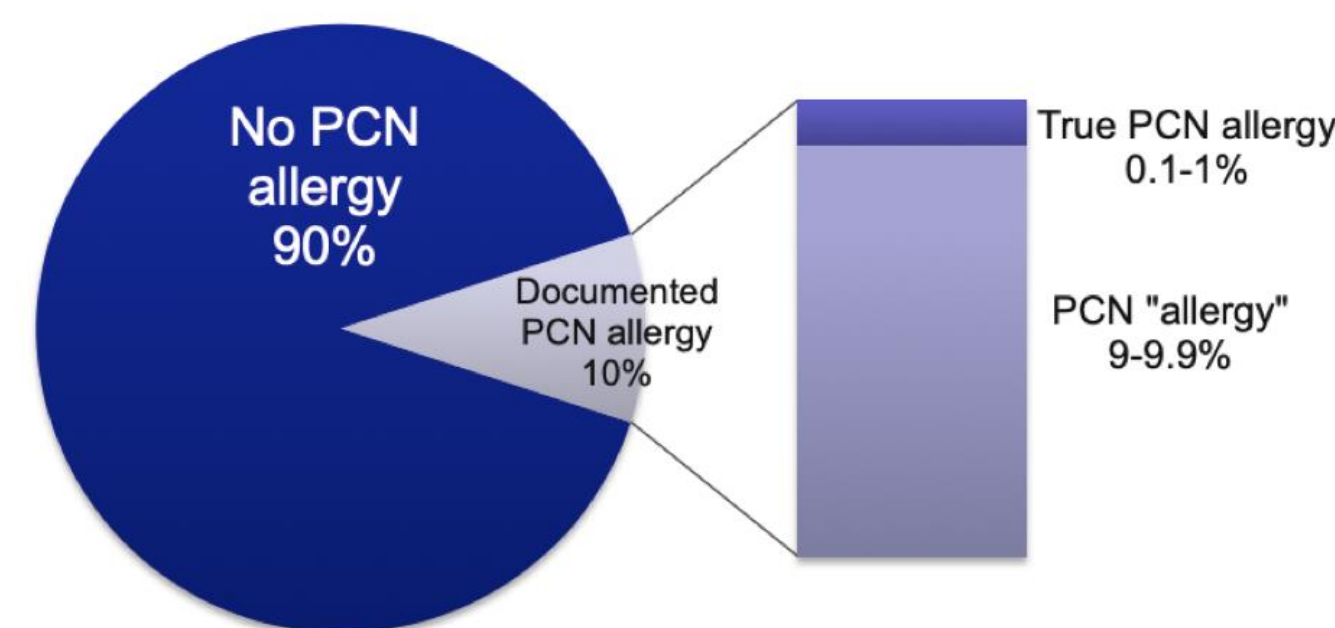


Figure 1. Discrepancy between reported and true PCN allergies.

Methodology

A cost analysis was conducted utilizing Average Wholesale Price from Medi-Span, which generates pricing data for UpToDate. All antibiotics were selected assuming no risk for multidrug resistant organisms and the shortest possible duration. Data were collected from a sample of 97 patients in the outpatient setting collected from 5 primary care providers. All patients had documented allergies to penicillin and had received at least one course of antibiotics for the treatment of one of several common outpatient infections.

Results

Outpatient diagnosis	Average cost of actual regimen	Cost of preferred regimen	Delta
Otitis media/externa	35.67	94.31	+58.64
Acute sinusitis	54.67	70.68	+16.01
CAP	53.26	58.48	+5.22
Non-purulent cellulitis	79.34	47.86	-31.48
Dental prophylaxis	5.32	26.09	+20.77
Tonsillitis	44.70	116.24	+71.54

Table 1. Comparison of the cost of antibiotic regimens against preferred PCN-based regimens used to treat common outpatient conditions. All preferred regimens were determined from the most up-to-date clinical guidelines and assuming the shortest possible course of treatment.

Diagnosis	Incidence	Cost of PCN regimen	Cost of non-PCN regimen	Delta
Nonpurulent cellulitis	3.87/1,000 PY	6.80	1.00	+5.80
Pyelonephritis	3-4/10,000	8.54	0.14	+8.40
CAP	248/100,000	16.90	0.10	+16.80
HAP	0.55/100 hospitalizations	188.44	0.14	+188.30
Neutropenic fever	2.4-15.4/million	53.84	34.20	+19.64
Endocarditis	3-10/100000 people	921.06	8.40	+912.66
VAP	1-2.5/1000 ventilator days	188.44	0.14	+188.30
Bacterial meningitis	16 million cases in total/year (2013)	19.64	262.78	-243.14
Diverticulitis	62/100,000; 200,000 cases annually	18.00	0.25	+17.75

Table 2. Comparison of PCN and non-PCN regimen costs for various inpatient diagnoses.

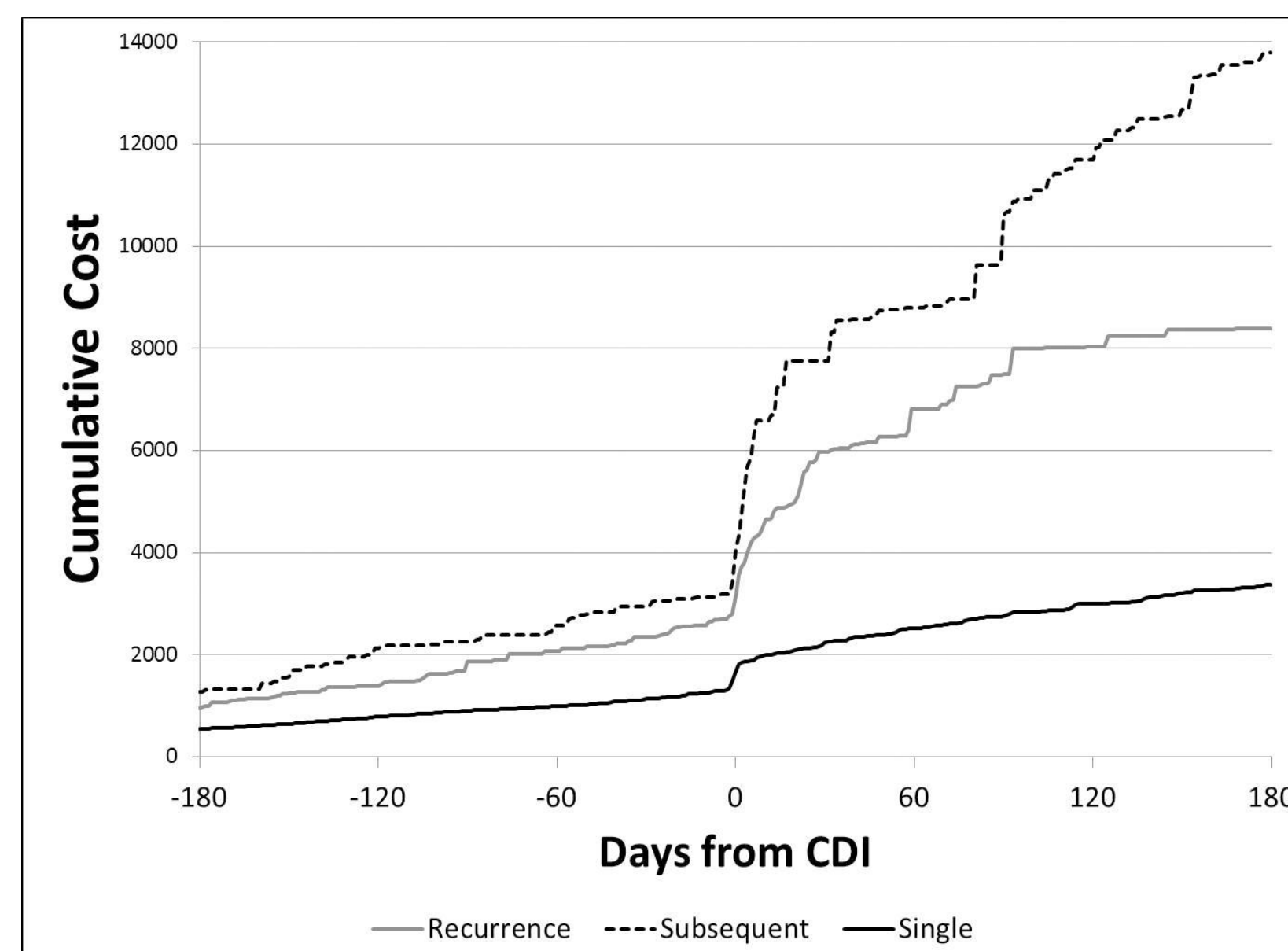


Figure 2. Cumulative median costs for those with single episode of community-associated C. difficile infection, recurrent, and one or more subsequent C. difficile infections.

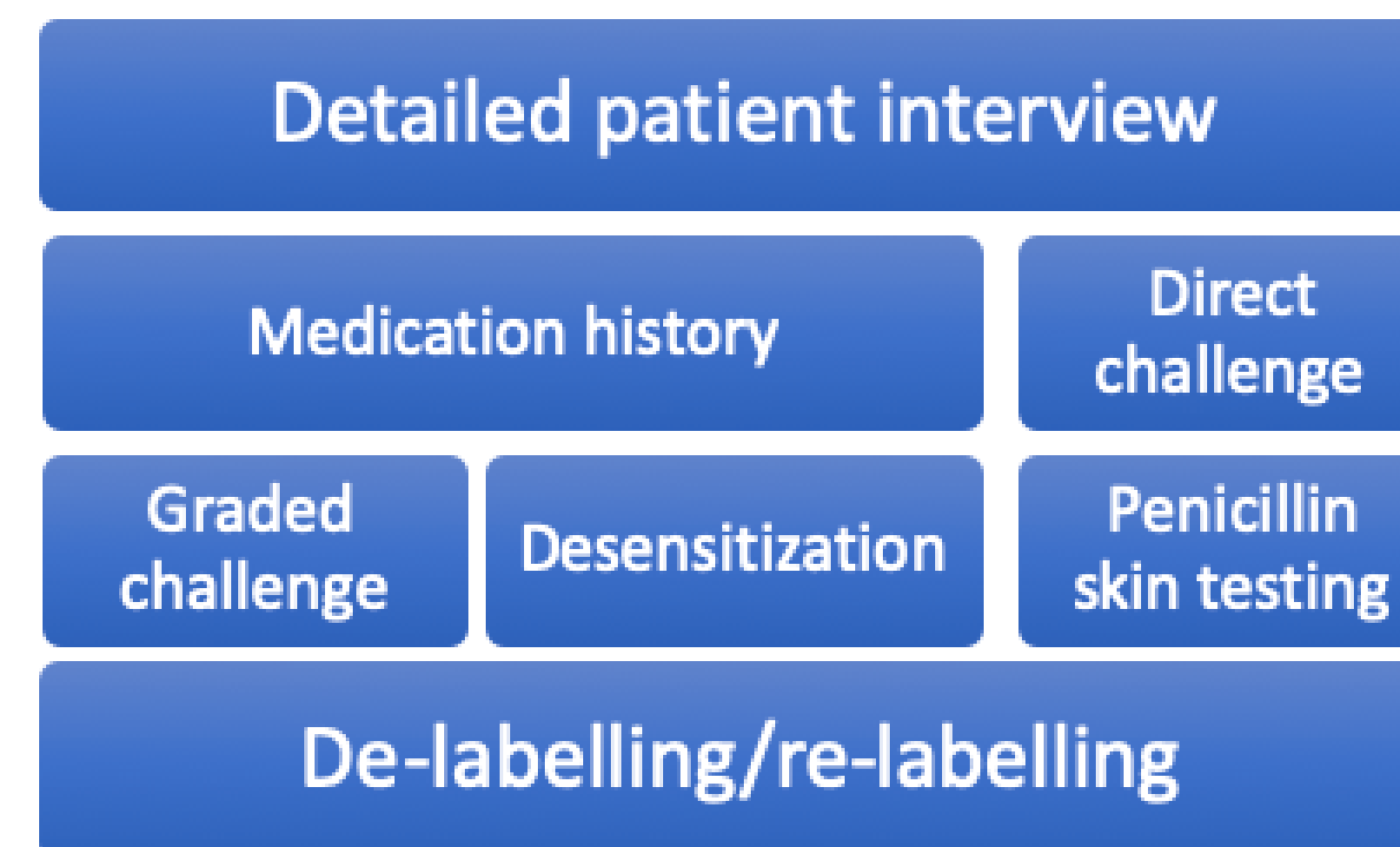


Figure 3. The process by which one can de-label a patient's documented penicillin allergy.

Discussion

- The relative risk of C. difficile infection increases with non-PCN antibiotic selections.
- Our data suggests an inability to recommend B-lactam antimicrobial therapy on the basis of retail antibiotic costs.
- However, infectious disease evidence is clear that initiating treatment with B-lactams reduces treatment failure and complications as well as readmissions and length of stay.
- Utilizing non-B-lactam regimens may increase development of MDR organisms.
- Implementing education to ensure accurate antibiotic allergies should reduce the burden of delabeling.

Conclusion

- Our preliminary cost analysis does not suggest a financial incentive to recommend health systems to emphasize B-lactam therapy first.
- Rather, the argument lies in reducing treatment failures and complications.
- Primary care physicians should be incentivized to use B-lactam regimens wherever possible to reduce treatment complications, antimicrobial resistance, and for patient safety.

References

- Direct cost of health care for individuals with community associated *Clostridium difficile* infections: A population-based cohort study
Singh H, Nugent Z, Walkty A, Yu BN, Lix LM, et al. (2019) Direct cost of health care for individuals with community associated *Clostridium difficile* infections: A population-based cohort study. PLOS ONE 14(11): e0224609. <https://doi.org/10.1371/journal.pone.0224609>
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