

# Evaluating Penicillin Allergy in the Primary Care Setting



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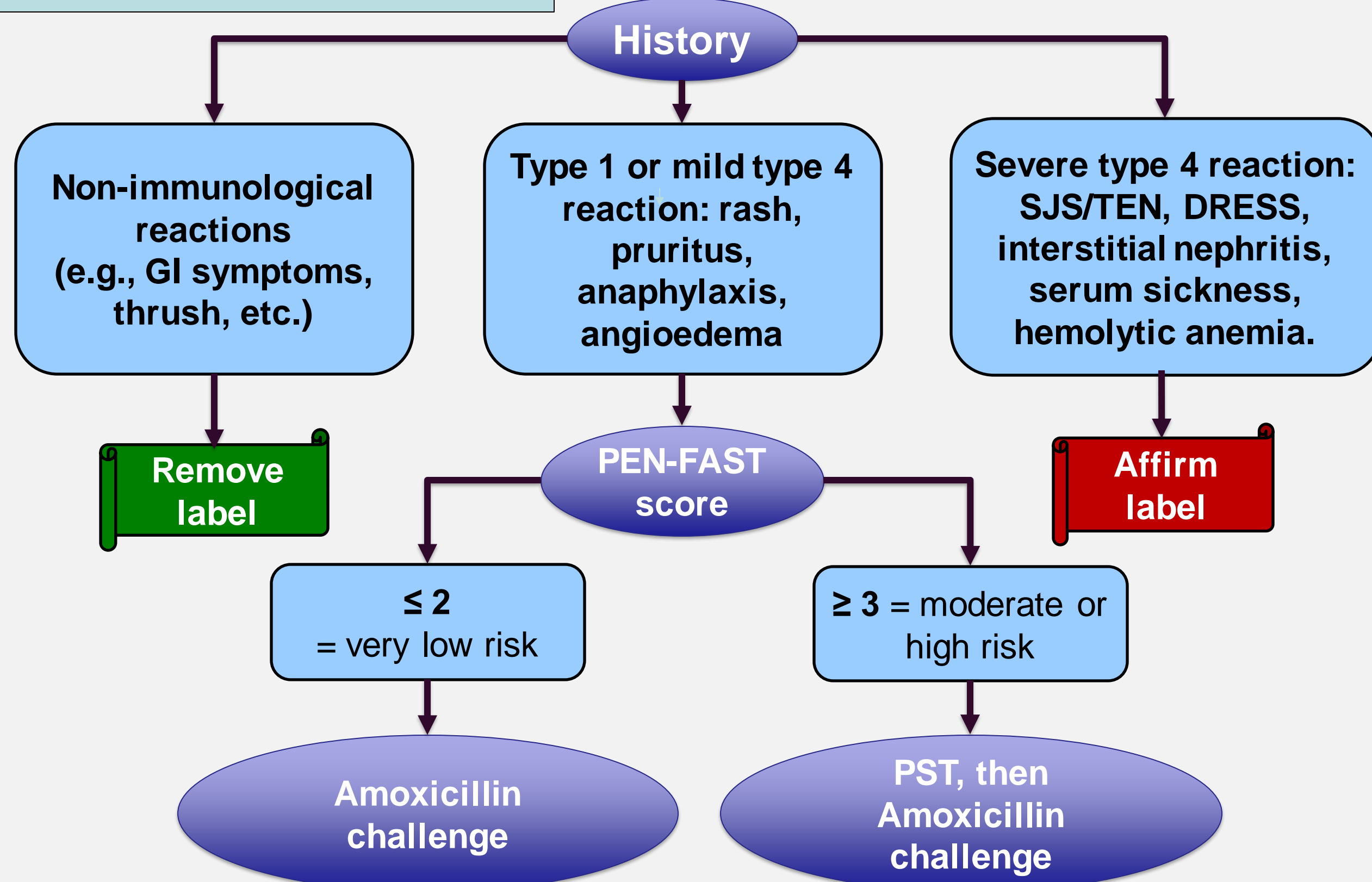
## INTRODUCTION

- Penicillin (PCN) is the most frequently reported antibiotic allergen. Approximately 10% of the US population claims PCN allergy, of whom, only 10% will have positive PCN skin testing (PST). Avoiding  $\beta$ -lactam antibiotics results in utilization of less effective, more expensive, broader spectrum, and less well tolerated antibiotics. The volume of patients with a PCN allergy label exceeds the capacity of allergy clinics.
- We implemented an evidence-based intervention in a primary care office to systematically identify opportunities for de-labeling inaccurate PCN allergies.

## METHODS

- From June 2021 through September 2022, we prospectively evaluated all consecutive patients presenting to the office of a teaching internist and had a label of PCN allergy in the electronic health record (EHR).
- We developed an algorithm (Fig. 1) for risk-stratification of PCN allergy by incorporating the existing system-wide University of Pittsburgh Medical Center (UPMC) algorithm and the validated PEN-FAST score. Our protocol was reviewed by the allergy, infectious diseases, and pharmacy departments.
- In addition, we reviewed data from EHR regarding prior antibiotic administration.

Fig.1: ALGORITHM OF PCN ALLERGY EVALUATION



## RESULTS

- 63 patients were evaluated.
- The PEN-FAST score distributions are shown, Fig.2
- 16 patients (25.4%) were eligible for label removal, of whom only 9 (14.3%) were agreeable.
- 1 patient had the allergy status affirmed.
- The remaining 46 patients (73%) were eligible for further evaluation by skin testing and/or oral amoxicillin challenge, however only 28 (44.4%) agreed.

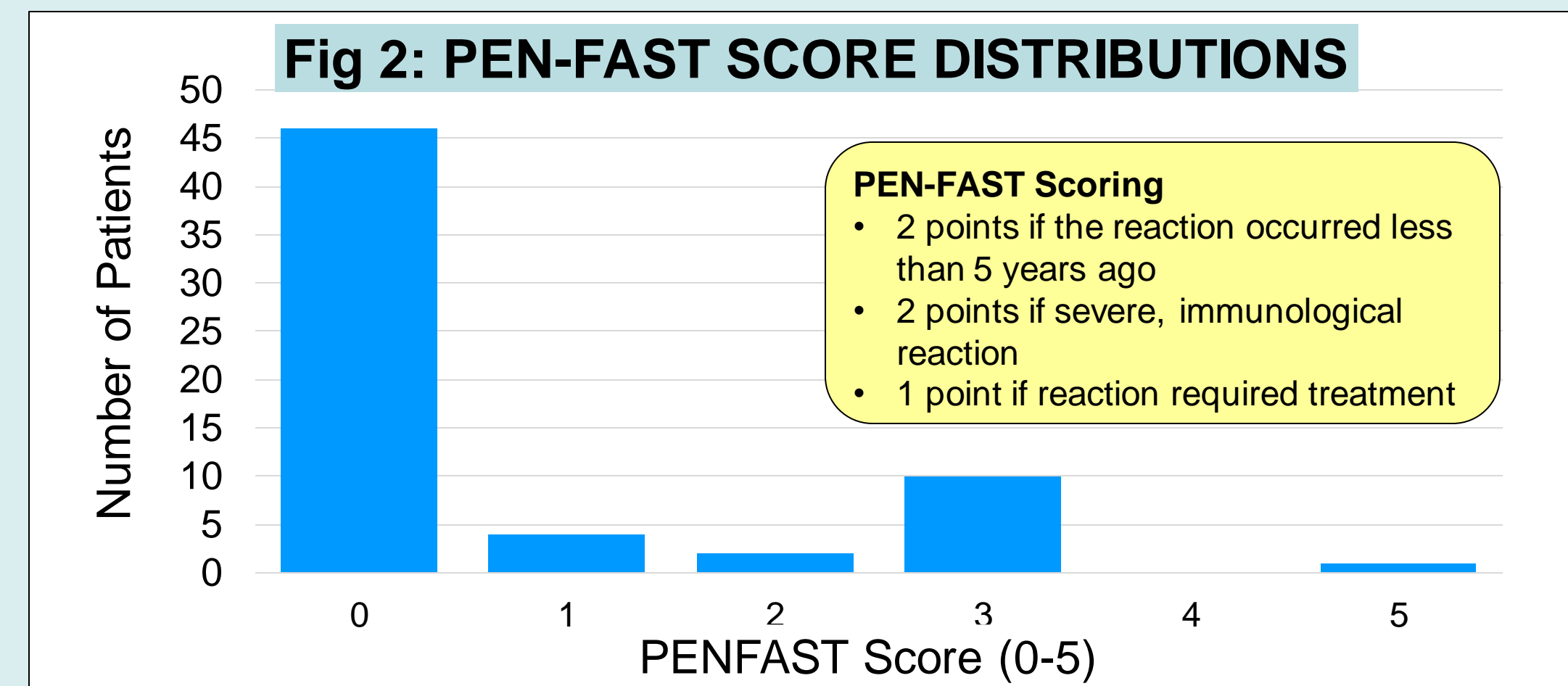
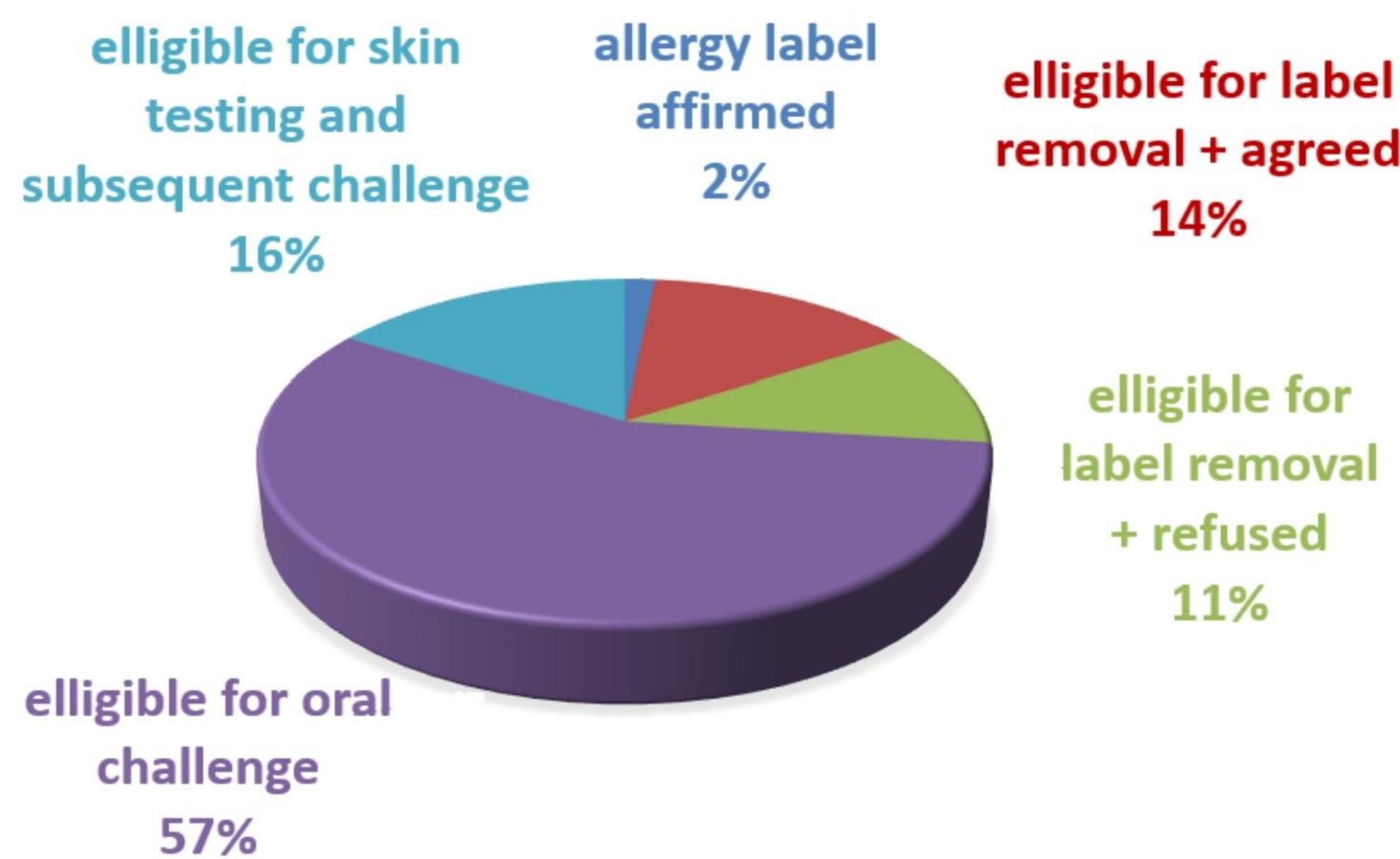


Fig. 3: OUTCOMES OF THE EVALUATION



## DISCUSSION

- 14.3% of patients in our cohort had their label removed by clinical evaluation.
- Per our protocol, most patients would require either amoxicillin challenge or skin testing followed by amoxicillin challenge before label removal, which requires additional training, cost, and resources. However, our algorithm was intentionally conservative, to accommodate potential low risk tolerance among primary care physicians.
- Both direct and indirect cost savings from avoiding non-penicillin antibiotics will likely offset the cost of further evaluation.
- Most patients can eventually have the label removed; however, we encountered many who were hesitant to make any change to their allergy status stating, "I don't want to take any chances", hence the importance of initial accurate documentation.
- Patients with any reported penicillin allergy may safely receive cefazolin.
- Other cephalosporins are generally safe in patients with penicillin allergies. Cross reactivity between B lactam antibiotics is traditionally over-estimated, currently reported consistently at < 2%. The immunologic reactions target the side chain, not the  $\beta$ -lactam ring, explaining less likelihood for cross-allergy.

## FUTURE DIRECTIONS

- Propose to our health system that non-immunological adverse effects of medications be documented separately from the allergy section.
- Recommend staff and physician training to avoid mislabeling.
- Expand the protocol to other practices.
- Seek approval and collaborate with the allergy department to administer skin testing and amoxicillin challenge at our office.
- Undergo cost effectiveness analysis.

## REFERENCES

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