Single Dose Oral Amoxicillin Challenge is a Safe and Effective Strategy to Delabel Penicillin Allergies among Low Risk Hospitalized Children

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Introduction

- More than 90% of children labeled allergic to penicillin can tolerate penicillin family antibiotics without incident
- Inappropriate penicillin allergies are associated with higher healthcare costs and increased side effects due to suboptimal antibiotics
- Developing effective and safe strategies to remove inappropriate penicillin allergies has the potential to improve care

Background

- In 2019, Children's Hospital Colorado (CHCO) implemented a penicillin allergy clinical pathway (PEN-CP) to identify and remove inappropriate penicillin allergies among hospitalized children
- The PEN-CP includes a risk assessment tool (Fig. 1) designed to stratify patients' likelihood of true penicillin allergy based on history
- Patients at "No Increased Risk" are educated and delabeled without testing
- "Low Risk" patients are offered an oral amoxicillin drug challenge with close observation (Fig. 2)
- A single, non-graded, treatment dose of amoxicillin (45 mg/kg, max dose 1000mg) is used
- No preceding allergic skin testing is performed
- Patients with no signs or symptoms of allergic response 60 minutes after amoxicillin administration are delabeled in the electronic medical record (EMR)

Fig. 1 Risk Assessment Tool

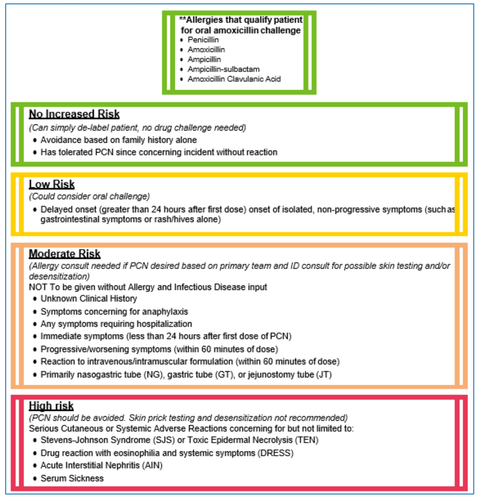
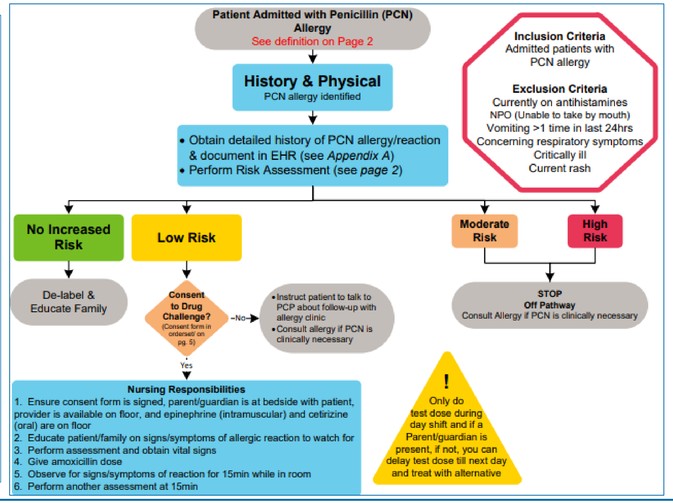


Fig. 2 Penicillin Allergy Delabeling Clinical Pathway Algorithm



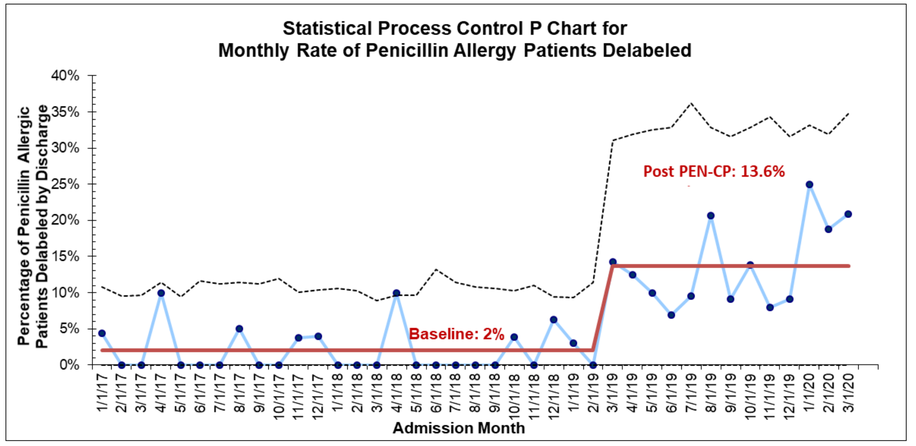
Methods

- Children admitted to CHCO Hospital Medicine from 1/1/17-3/31/20 reporting penicillin allergy at time of admission were identified
- Baseline rates of penicillin delabeling by discharge (1/1/17-3/31/19) were compared to delabeling rates following PEN-CP implementation (4/1/19-3/31/20)

Results

- Baseline: 683/10624 (6.4%) patients reported a penicillin allergy; 18/683 (2.6%) delabeled by discharge
- Post PEN-CP: 345/6559 (5.3%) patients reported a penicillin allergy; 47/345 (13.6%) delabeled by discharge (*P*-value <0.0001, Figure 3), special cause variation seen at 3/1/19
  - 19/47 were delabeled via oral amoxicillin challenge
  - 17/47 received a different treatment dose penicillin per treatment team
  - 11/47 were delabeled by history alone
- Only one penicillin-exposed patient had a reaction following oral amoxicillin challenge and developed delayed onset of a non-progressive rash. Patient was not delabeled of their penicillin allergy.
- No patient required emergency medical intervention
- No patient was "relabeled" penicillin allergic in the 6 months following discharge.

Figure 3. Monthly Rate of Penicillin Allergic Patients Delabeled by Discharge



Conclusions

- A drug challenge using a single non-graded dose of oral amoxicillin is a safe and effective strategy to delabel low risk children of inappropriate penicillin allergies when implemented alongside a risk assessment tool
- Further studies are needed to evaluate the long-term benefits of delabeling inappropriate penicillin allergies and to continue monitoring for adverse events