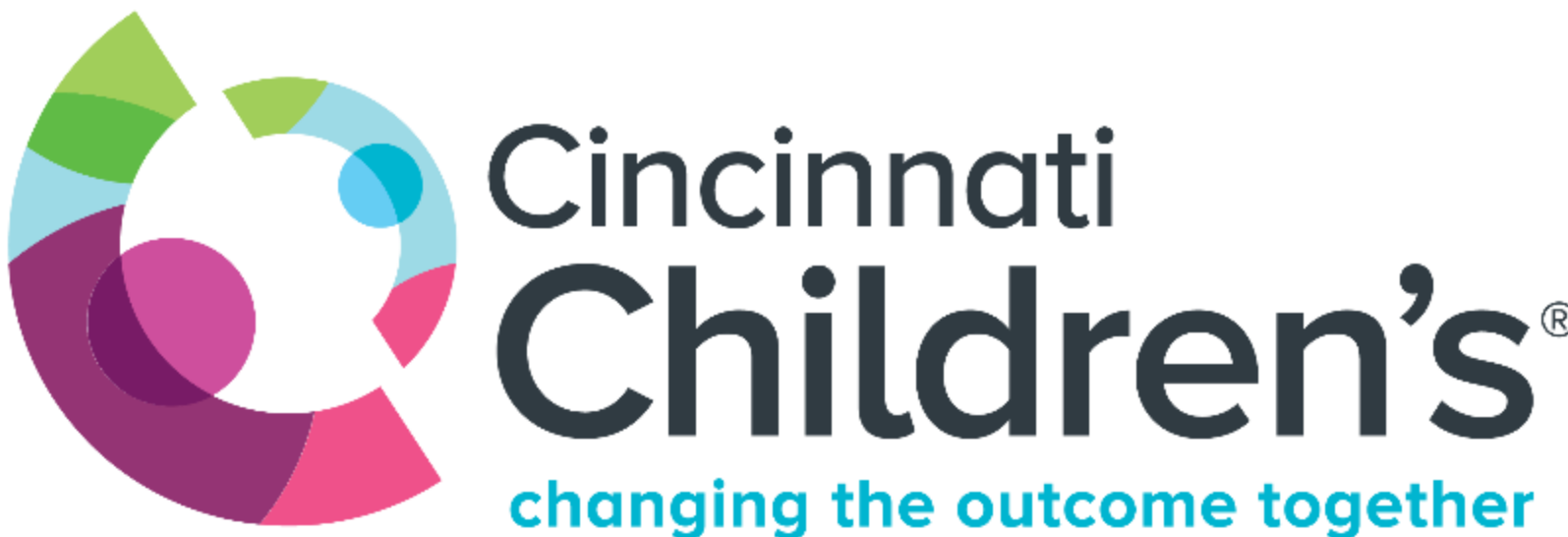


Innovative Acute Care Allergy Service (ACAS) Provides Timely Specialist Evaluation and Management for Children Experiencing Antibiotic-Associated Reactions

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Background

- Antibiotic-associated reactions (AARs) are a poorly understood constellation of cutaneous and systemic “allergic” symptoms that bring substantial concern to patients and families
- AARs contribute to over 25% of emergency department/urgent care (ED/UC) adverse drug events with high rates of acute care reutilization -- up to 40% of infants will reutilize acute care resources a second or third time^{1,2}
- Although experts in treating allergic reactions, allergists have historically not evaluated patients at the time of acute onset of AARs
- Early allergy specialist engagement could provide ideal clinical management:
 - Longitudinal evaluations of dynamic, persistent, and “worrisome” AAR symptoms over time
 - Prescribing non-sedating antihistamines and anti-inflammatory medications
 - Consistent messaging about of subsequent allergy testing communicated to families
- We created a first-in-kind allergy specialist service providing **Acute Care Allergy Service (ACAS)** appointments for AARs that we theorized could reduce ED/UC utilization and reutilization while also enhancing the likelihood of subsequent antibiotic allergy testing

Objectives

Review quality of our innovative ACAS program, under the umbrella of the Pediatric Antibiotic Allergy Testing Service (PATS), seeing children with AARs with a focus on presenting symptoms, acute care utilization, timely access, and subsequent testing

Methods

- All children utilizing ACAS were identified by use of a dedicated antibiotic allergy flowsheet in EMR
- Clinical data was collected at acute care appointments for AARs
- For quality assessment, additional data was collected retrospectively by chart review to include evaluation of source and time of initial referral, timing of acute care appointments, treatment plans, and subsequent health care utilization
- Primary quality outcomes included post-acute care utilization, treatment recommendations, and subsequent scheduling and completion of allergy testing for the offending drug

Figure 1. Typical evolution of antibiotic-associated reaction rash (Xie, et al.)

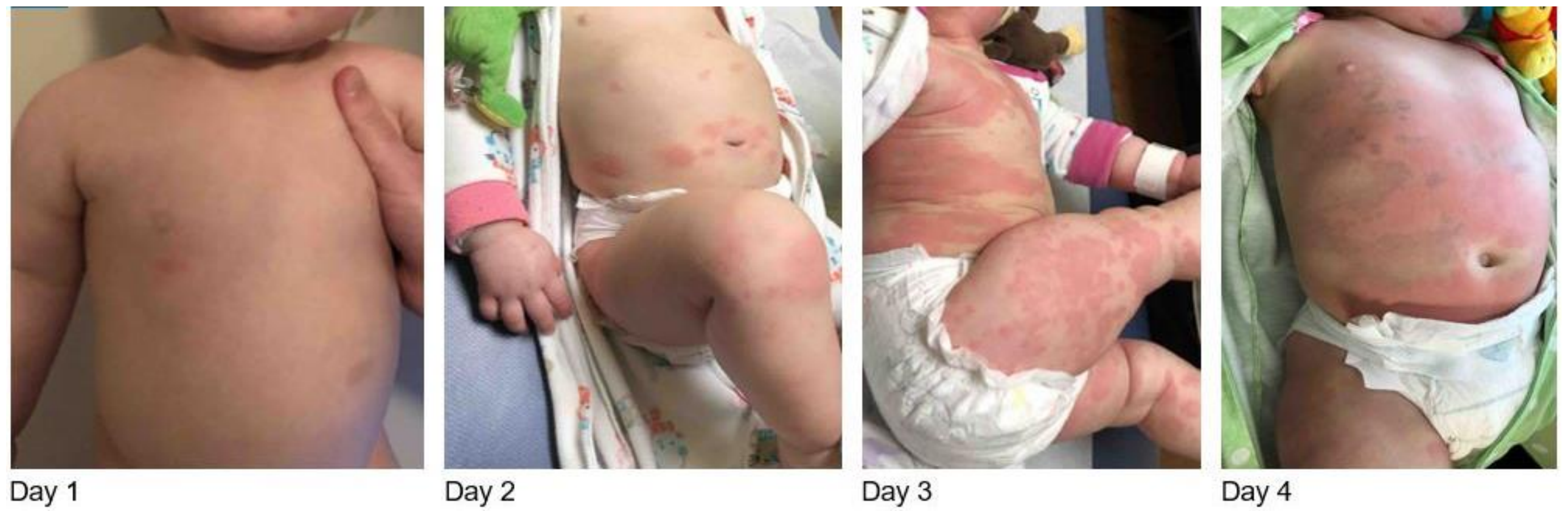
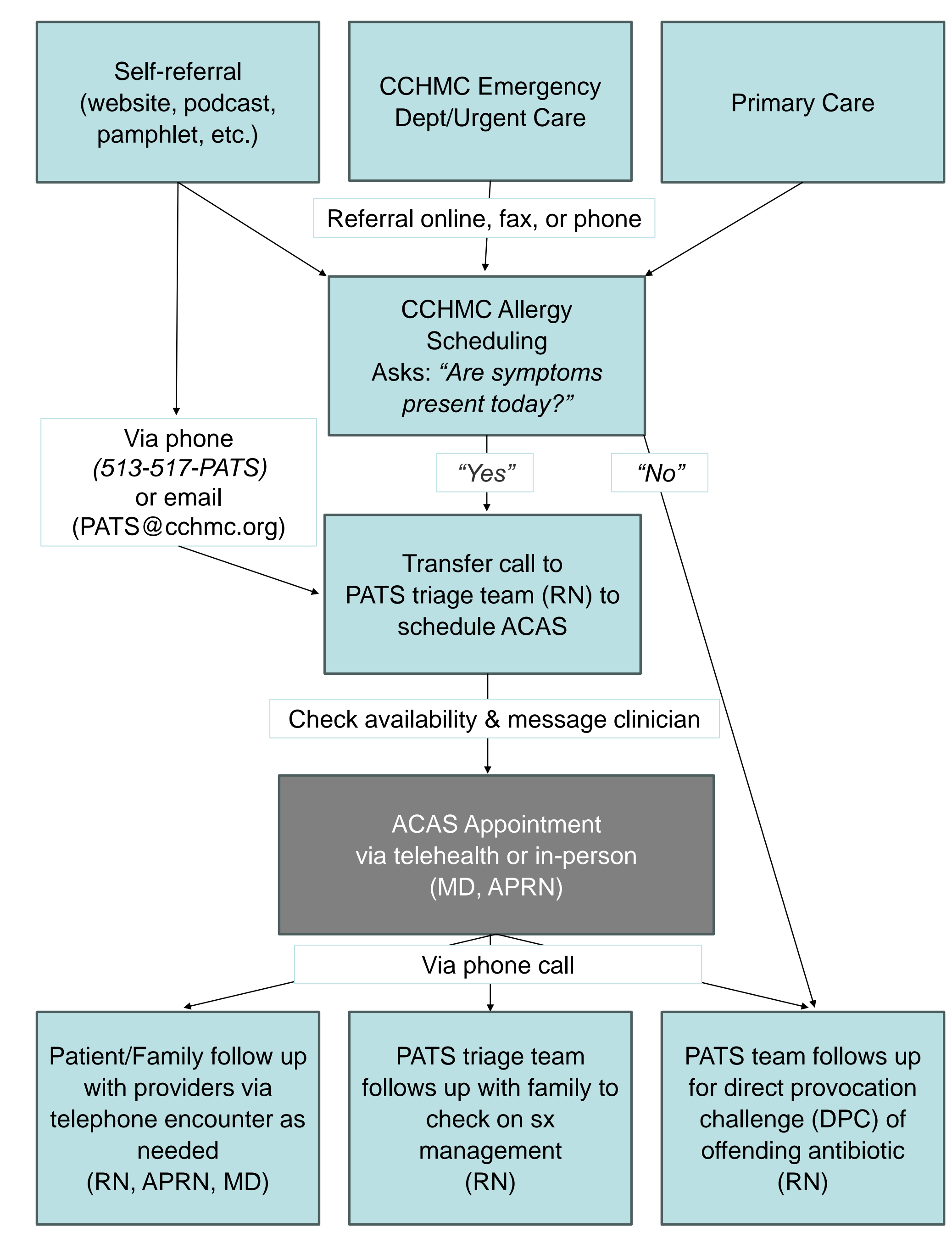


Figure 2. Referral process for ACAS



ACAS website



PATS website



Table 1. Age range of children with AARs (%)

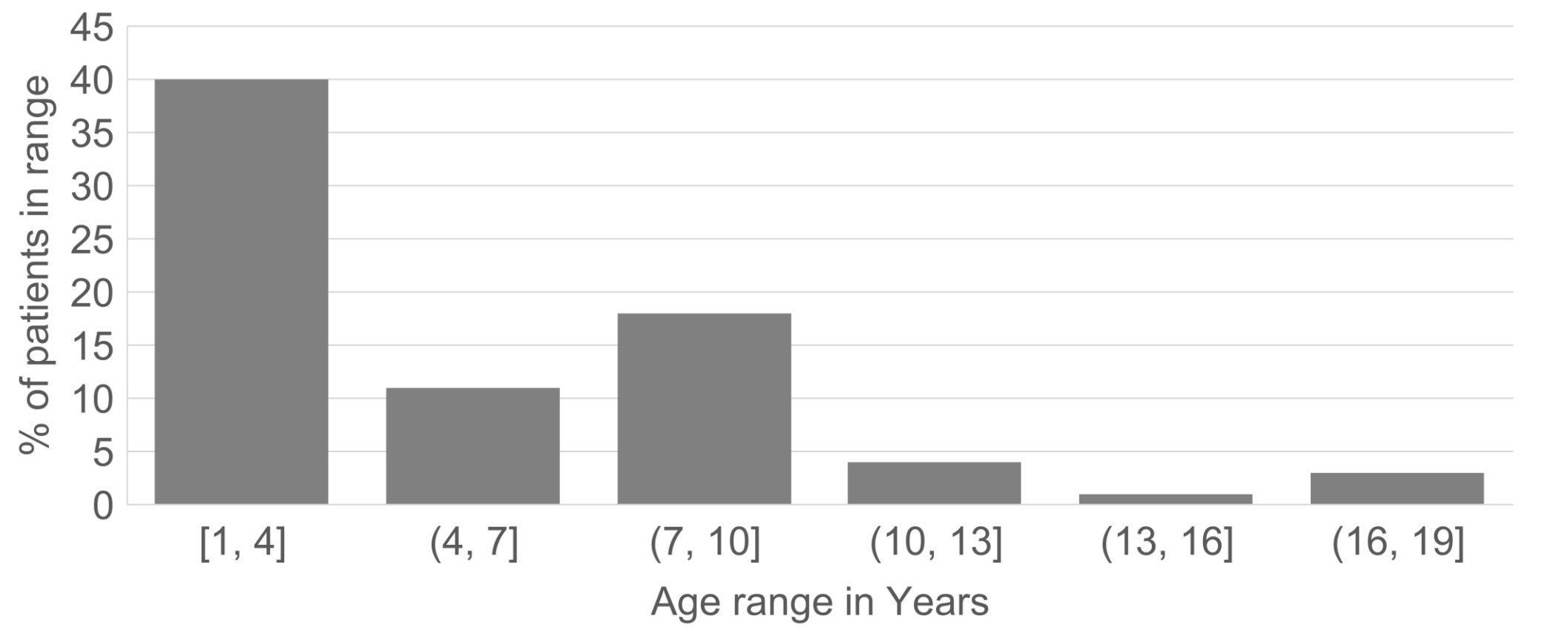


Table 2. Care utilization, pre-ACAS (%)

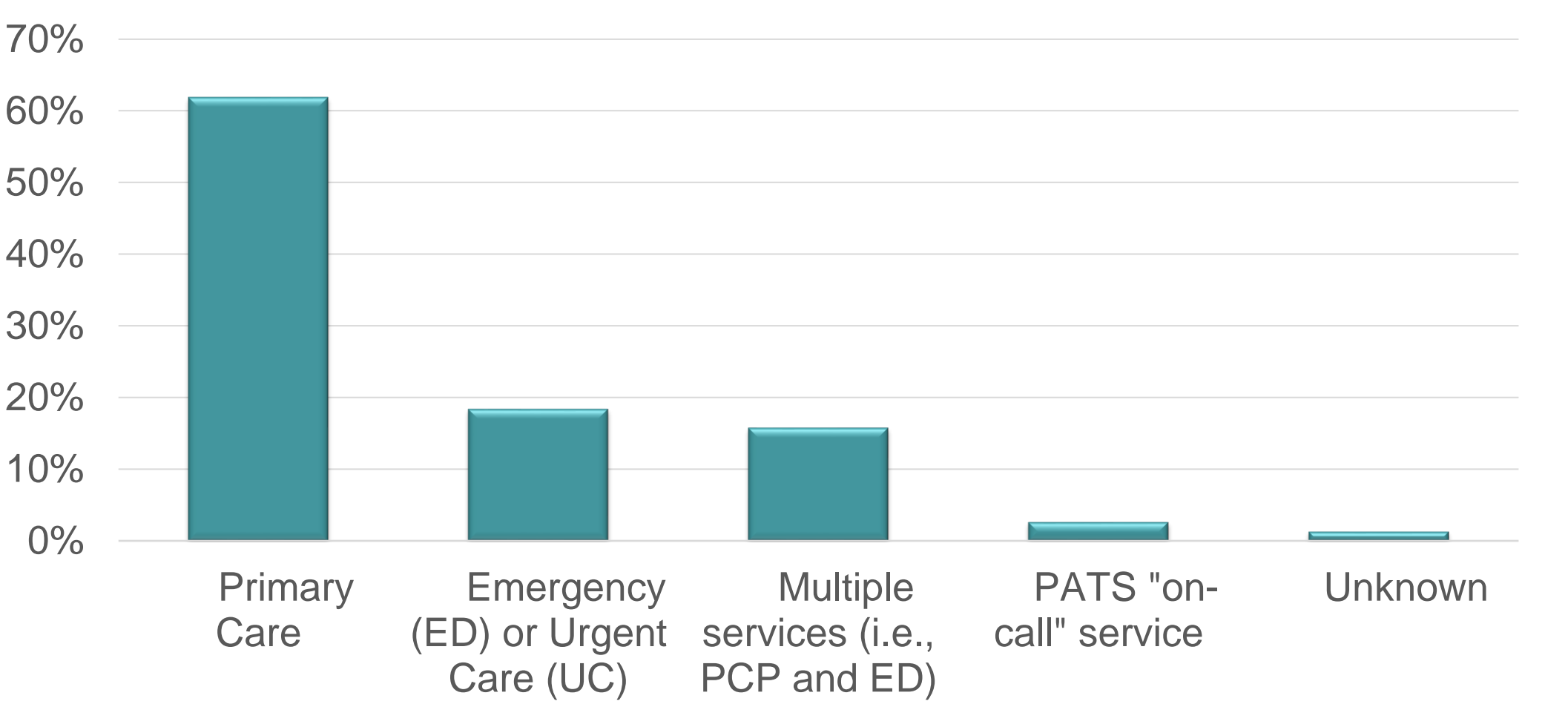
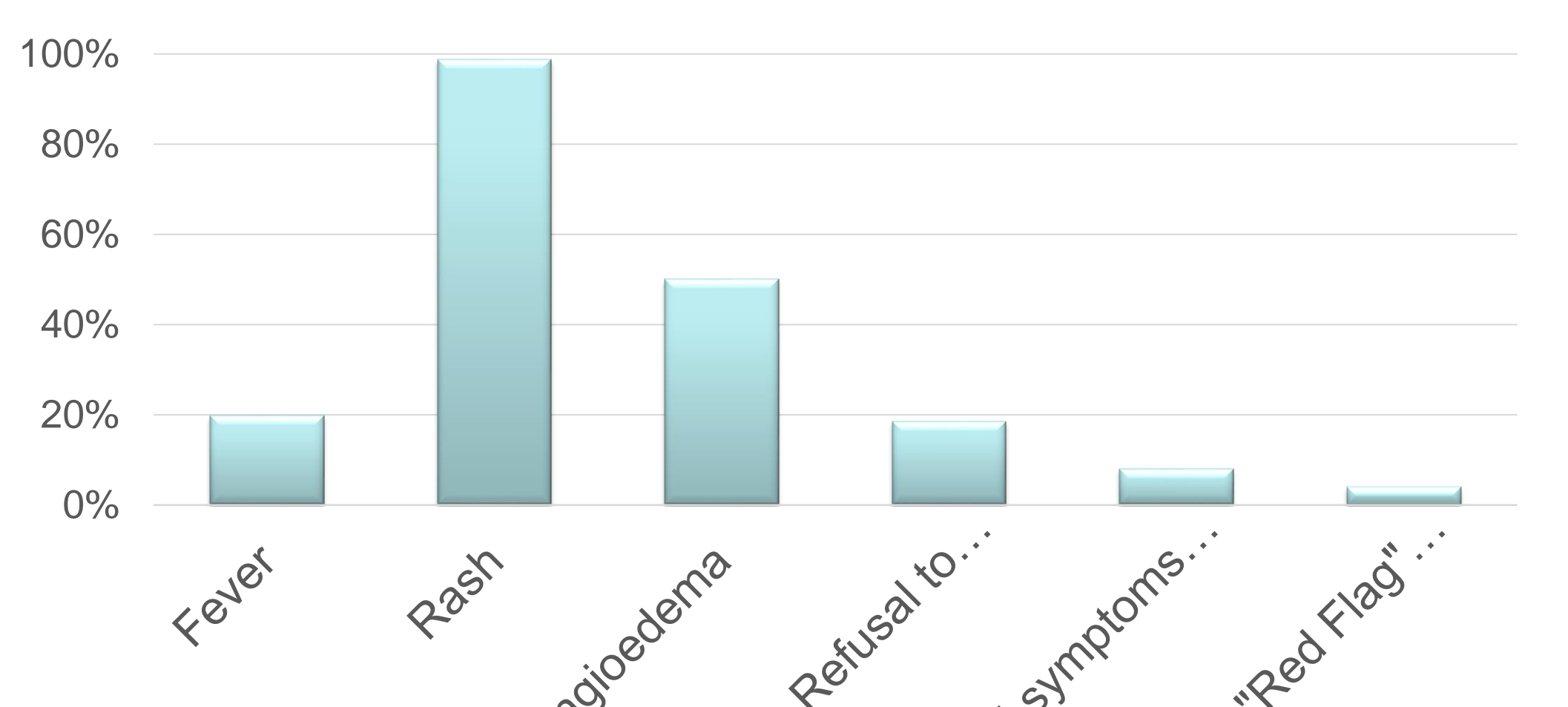


Table 3. AAR symptoms (%)



Results & Measures of Success

- Cohort: **76 patients** utilized ACAS Jan 2020-May 2023 (outside of data set, but exponential rise in ACAS patient volume this past winter 2023-2024)
- **Characteristics of patients utilizing ACAS in the first 3 years:**
 - Majority of patients were 1-4 years of age
 - 34% of children had been to ED/UC pre-ACAS
 - **Rash** was predominant symptom; **Angioedema** was noted in 50% of ACAS patients; **Fever** and **joint** complaints were noted in 20% of patients
- Time from onset AAR to ACAS appt - **mean 2d**
- Time from referral to ACAS appt - **mean 8hr**
- **Pre-ACAS treatment:**
 - First-gen antihistamines (67%), second-gen antihistamines (46%), systemic steroids (17%)
- **Post-ACAS treatment:**
 - Second-gen antihistamines (93%), H2 antihistamines (49%), topical steroids (14%)
- **Only 2 patients (3%) reutilized ED/UC post-ACAS**
- 5 patients (7%) returned to PCP post-ACAS
- Allergy testing completed in 21/55 eligible patients

Conclusion

- ACAS offered patients experiencing AARs **rapid access to allergy subspecialty care, on-call follow up, and proactive recommendations for future antibiotic allergy testing.**
- ACAS provided **uniform recommendations of non-sedating anti-histamines**, and children experienced **low rates of ED/UC re-utilization.**

Opportunities for Future Research

- ACAS program provides a unique opportunity to engage families in much-needed, prospective acute care research for AARs, with opportunities for –
- Comparison of ED/UC reutilization for ACAS with traditional PCP and/or ED/UC setting visits
 - Comparison of duration of symptoms with sedating vs non-sedating antihistamines; steroids vs no steroids
 - Evaluation of inflammatory cascades
 - Evaluation of subsequent allergy testing - *is it truly an “allergy?”*

References:
¹Cohen AL, Budnitz DS, Weidenbach KN, Jernigan DB, Schroeder TJ, Shehab N, Pollock DA. National surveillance of emergency department visits for outpatient adverse drug events in children and adolescents. J Pediatr. 2008 Mar;152(3):416-21. doi: 10.1016/j.peds.2007.07.041. Epub 2007 Oct 22. Erratum in: J Pediatr. 2008 Jun;152(6):893. PMID: 18280852
²Xie SS, Guarneri KM, Courter JD, Liu C, Ruddy RM, Risma KA. Predictors of Acute Care Reutilization in Pediatric Patients With Amoxicillin-Associated Reactions. J Allergy Clin Immunol Pract. 2022 Nov;10(11):2958-2966.e3. doi: 10.1016/j.jaip.2022.06.048. Epub 2022 Jul 21. PMID: 35872215.