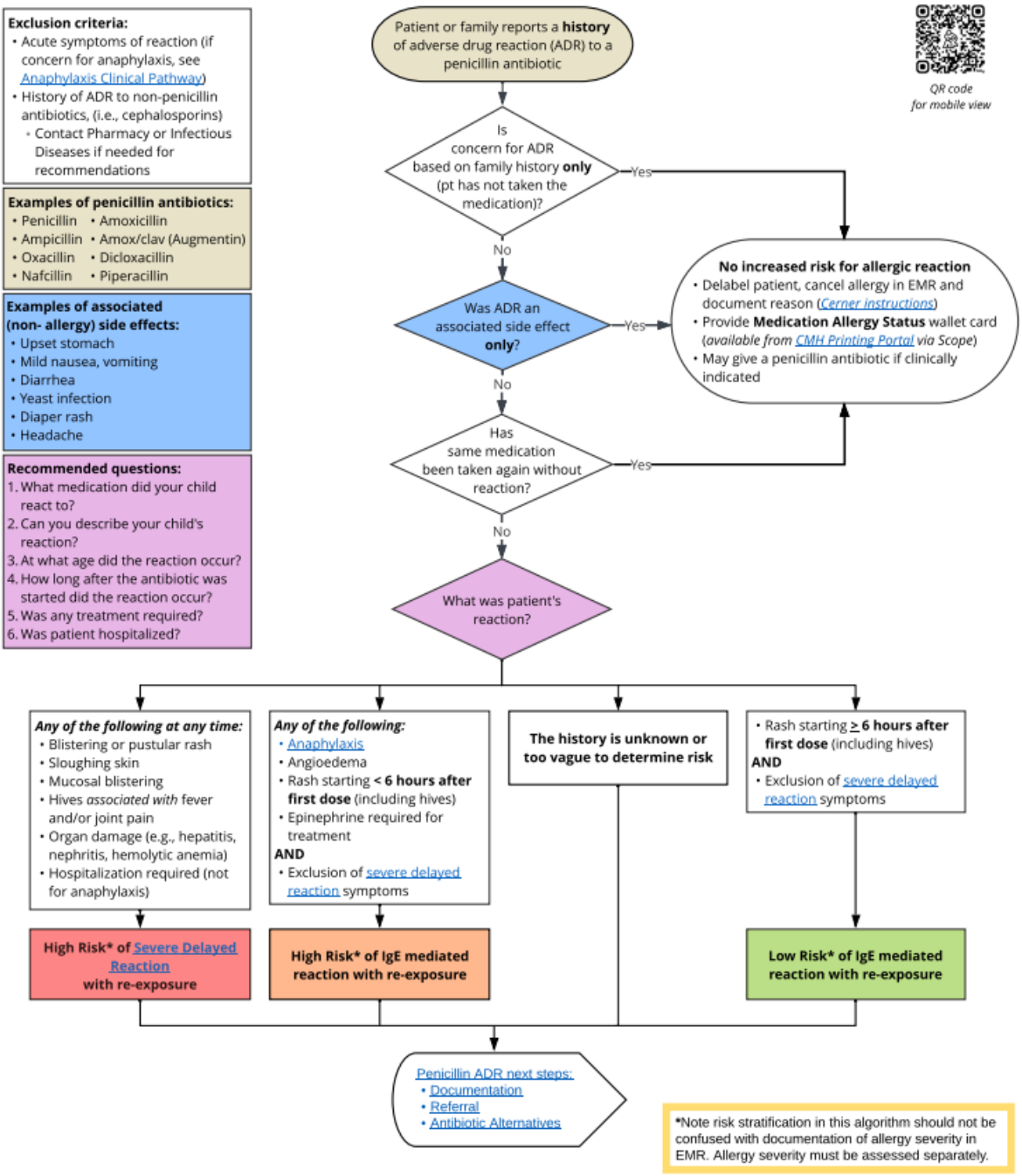
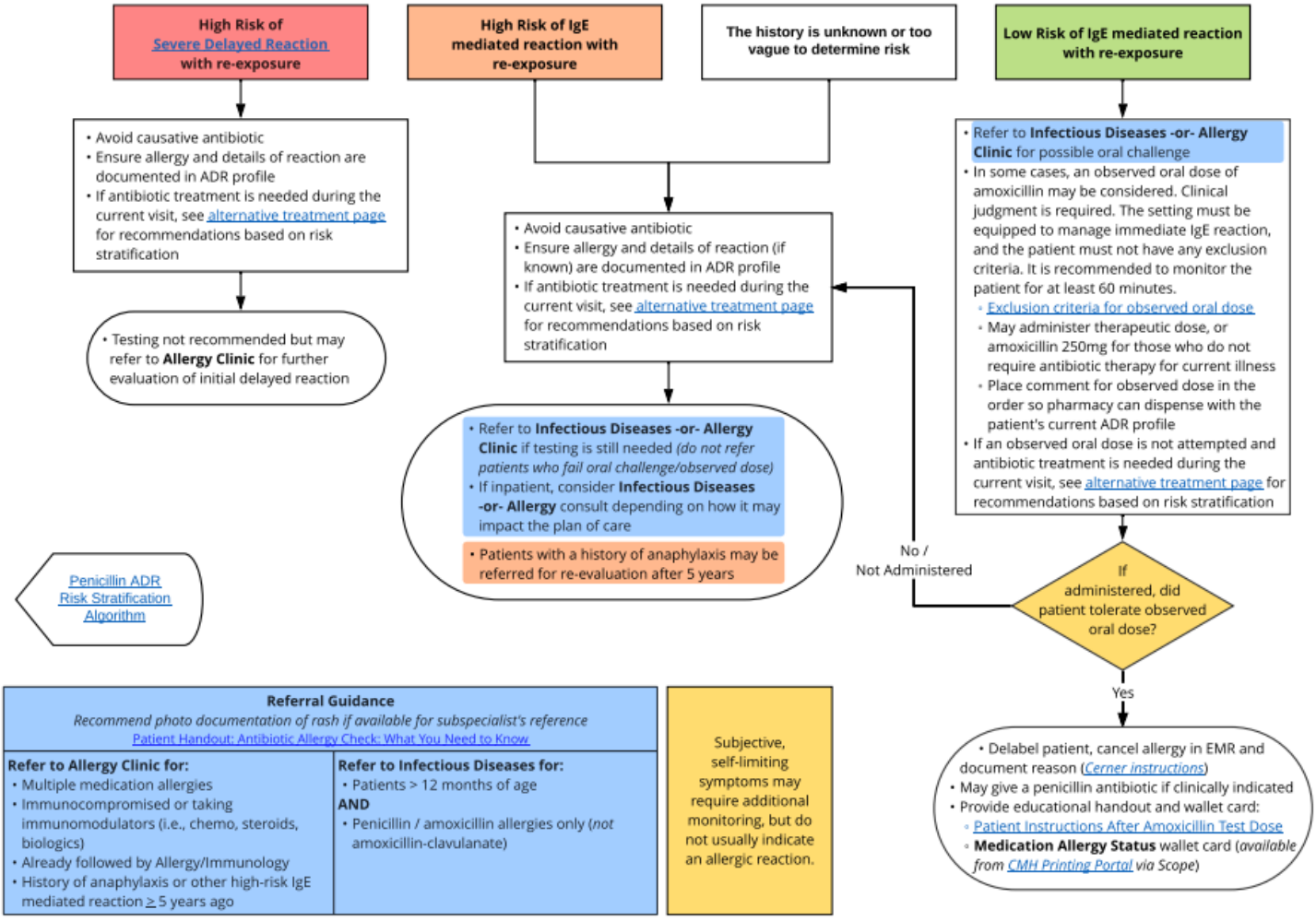
Penicillin Adverse Drug Reaction (ADR)
Clinical Pathway Synopsis

Penicillin ADR (HISTORICAL) Risk Stratification Algorithm

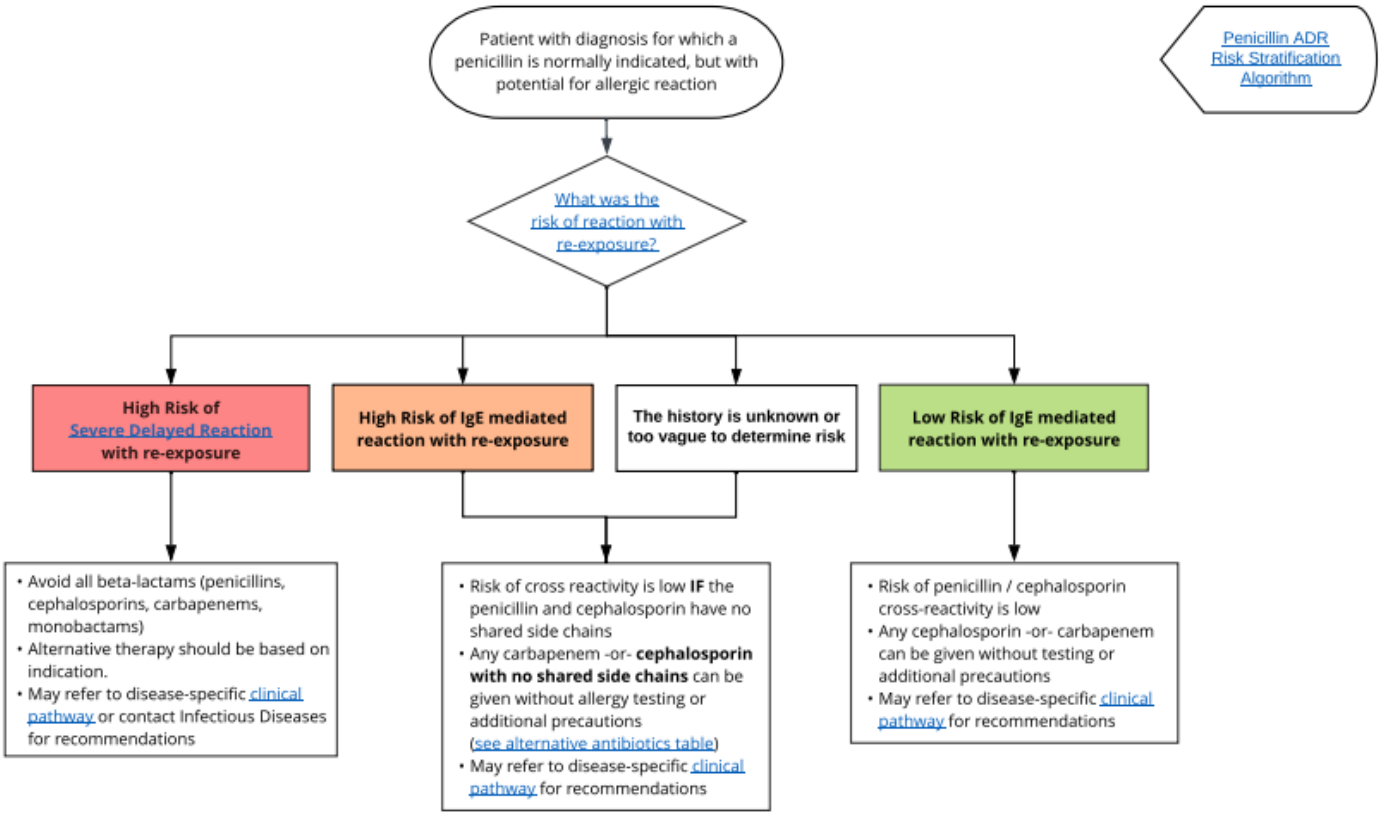


These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

Penicillin ADR (HISTORICAL) Documentation, Referral, & Antibiotic Alternatives Algorithm



Penicillin ADR (HISTORICAL) Antibiotic Alternatives Algorithm



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Objective of Clinical Pathway

This pathway aims to provide care standards for the patient with a reported history of adverse drug reaction (ADR) to a penicillin antibiotic.

Background

According to the Center for Disease Control and Prevention (CDC), 10% of patients in the United States report a history of allergic reaction to a penicillin antibiotic, but less than 1% are truly allergic (CDC, 2024). The avoidance of these antibiotics in clinical care due to presumed allergy leads to the use of broad-spectrum antibiotics, which are often less effective and cause increased prescription drug costs and side effects, and antimicrobial resistance for patients (Castells et al., 2019; Powell et al., 2024). Failure to formally assess reported penicillin allergies perpetuates these negative consequences throughout a patient's lifetime and contributes to increased public healthcare costs through increased antimicrobial resistance, increased length of hospital stays, and even increased mortality rates (Castells et al., 2019; Zhang et al., 2024).

The current approach to evaluating patients with reported penicillin allergies includes obtaining a detailed history of the reaction with particular attention to the severity and timing of symptoms. These historical details allow patients to be risk-stratified according to their risk for future immediate IgE or severe cutaneous adverse drug (SCAR) reactions upon re-exposure (Accarino et al., 2025; Khan et al., 2022). Once patients have been risk-stratified, recommendations can be made for treatment and testing either during the acute care visit or after referral to subspecialty care. This pathway therefore seeks to guide the systematic evaluation, management, and referral of patients with reported histories of adverse drug reactions to penicillin antibiotics to optimize individual care and reduce the public health burden of inappropriate antimicrobial utilization.

Target Users

- Physicians (Emergency Department, Urgent Care, Hospital Medicine, Ambulatory, Fellows, Residents)
- Advance Practice Providers
- Nurses
- Pharmacists

Target Population

Inclusion Criteria

- Patients with reported history of ADR to penicillin antibiotic (e.g., amoxicillin, amoxicillin/clavulanate, ampicillin, dicloxacillin, nafcillin, oxacillin, penicillin, piperacillin)

Exclusion Criteria

- Acute symptoms of a reaction (if concern for anaphylaxis, see Anaphylaxis Clinical Pathway)
- History of ADR to non-penicillin antibiotics (e.g., cephalosporins)

Practice Recommendations

In lieu of a clinical practice guideline fully addressing the evaluation and management of pediatric patients with reported penicillin allergies, guidance from the literature (Jeimy et al., 2020; Khan et al., 2022) was used in conjunction with the expert consensus of the Penicillin ADR Clinical Pathway Committee to inform the risk stratification, documentation, and referral recommendations in this pathway.

Additional Questions Posed by the Clinical Pathway Committee

No clinical questions were posed for this review

Measures (collected by Urgent Care and/or ED)

- Percent of encounters with a penicillin allergy listed
- Percent of penicillin allergies canceled during visit
- Percent of penicillin allergies added during visit
- Percent of patients with unknown severity of reaction
- Percent of patients referred to Allergy/Infectious Diseases (ID)
- Percent of patients scheduled for follow-up with Allergy/ID

- Percent of patients who attend follow-up appointment with Allergy/ID
- Reason for not attending follow-up appointment with Allergy/ID, if applicable
- Percent of patients de-labeled in Allergy/ID Clinic
- Percent of patients de-labeled who had their allergy label reapplied

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased prescription costs for families when a penicillin antibiotic is used
- Decreased utilization of broad-spectrum antibiotics (e.g., cephalosporins, clindamycin)
- Decreased unwarranted variation in care
- Decreased inequities in care related to social determinants of health

Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers
- Time required to obtain a detailed history and, if indicated, monitor during an oral challenge
- Challenges in reporting the historical details of the prior reaction
- Communication of allergy updates (including de-labeling) across care settings and pharmacies

Potential Facilitators

- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of the clinical pathway

Bias Awareness

Healthcare disparities related to cost and access to care were considered in the development of this pathway. As subspecialty follow-up for allergy testing can be difficult to arrange for many families, recommendations were included for acute care providers to evaluate patients in their respective care settings utilizing clinical judgment and shared decision-making.

Associated Policies

- Adverse Reaction Identification, Documentation and Follow-up

Education Materials

Educational tools were edited for health literacy and reviewed by a patient/family advisor committee member.

- **Medication Allergy Status** wallet card (*available from CMH printing portal - search for "Medication Allergy"*)
- Penicillin: What Is It and How to Check for a Penicillin Allergy
- Antibiotic Allergy Check: What You Need to Know (referral information)
- Patient Instructions after Amoxicillin Test Dose

Clinical Pathway Preparation

This pathway was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Penicillin ADR Clinical Pathway Committee composed of content experts at Children's Mercy Kansas City. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Penicillin ADR Clinical Pathway Committee Members and Representation

- Jennifer McKinsey, MD | Urgent Care | Committee Co-Chair
- Amanda Nedved, MD | Urgent Care | Committee Co-Chair
- Theodore Barnett, MD | Emergency Medicine| Committee Member
- Rana El Feghaly, MD, MSCI, CPHQ | Infectious Diseases | Committee Member
- Lauren Estes, BSN, RN | Emergency Department | Committee Member
- Christopher Miller, MD | Allergy, Asthma and Immunology | Committee Member

- Brandi Missel, APRN | Emergency Department | Committee Member
- Maria Newmaster, MD | Pediatric Hospital Medicine Fellow | Committee Member
- Aarti Pandya, MD | Allergy, Asthma and Immunology | Committee Member
- Nakita Raje, MD | Allergy, Asthma and Immunology | Committee Member
- Jamie Sherwood, RN, BSN, CPN, CPST, CBC | Urgent Care | Committee Member
- Viktoriya Stoycheva, MHA, BSN, RN, CPN | Emergency Department | Committee Member
- Sarah Suppes, PharmD | Clinical Pharmacology and Toxicology | Committee Member
- Jana Wheeler, MSN, RN, NI-BC, CPN | Clinical Practice and Quality | Committee Member
- Ann Wirtz, PharmD, BCPPS | Pharmacy / Medication Safety Coordinator | Committee Member
- Chelsea Wolfe, MD | General Academic Pediatrics | Committee Member

Patient/Family Committee Member
- Sheryl Chadwick, BS | Committee Member

EBP Committee Members
- Kathleen Berg, MD, FAAP | Hospitalist, Evidence Based Practice
- Kori Hess, PharmD | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Allergy, Asthma and Immunology, Clinical Practice and Quality, Emergency Department, General Academic Pediatrics, Hospital Medicine, Infectious Diseases, Pharmacy, Urgent Care, and Evidence Based Practice.

Conflict of Interest

The contributors to the Penicillin ADR (HISTORICAL) Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process
- This pathway was reviewed and approved by the Penicillin ADR Clinical Pathway Committee after garnering feedback from their respective Departments/Divisions and the EBP Department, after which it was approved by the Medical Executive Committee.

Review Requested

Department/Unit	Date Obtained
Allergy, Asthma and Immunology	September 2025
Clinical Practice and Quality	September 2025
Clinical Pharmacology and Toxicology	September 2025
Emergency Department	September 2025
General Academic Pediatrics	September 2025
Hospital Medicine	September 2025
Infectious Diseases	September 2025
Pharmacy	September 2025
Urgent Care	September 2025
Evidence Based Practice	September 2025

Version History

Date	Comments
September 2025	Version one – Developed Penicillin ADR (HISTORICAL) Clinical Pathway algorithms, synopsis, child pages, educational handouts, and wallet card

Date for Next Review
- 2028

Implementation & Follow-Up

- Once approved, the pathway was implemented and presented to appropriate care teams:
  - Announcements made to relevant departments
  - Additional institution-wide announcements made via the hospital website and relevant huddles
  - Presented to Nursing Practice Council
- Community clinics affiliated with CM received announcements via "Progress Notes"
- Care measurements may be assessed and shared with appropriate care teams to determine if changes need to occur.
- Pathways are reviewed every 3 years (or sooner) and updated as necessary within the EBP Department at CMKC. Pathway committees are involved with every review and update.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) that accompany the clinical pathway.

These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment to determine what is in the best interests of the patient based on the circumstances existing at the time.

It is impossible to anticipate all possible situations that may exist and to prepare clinical pathways for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

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