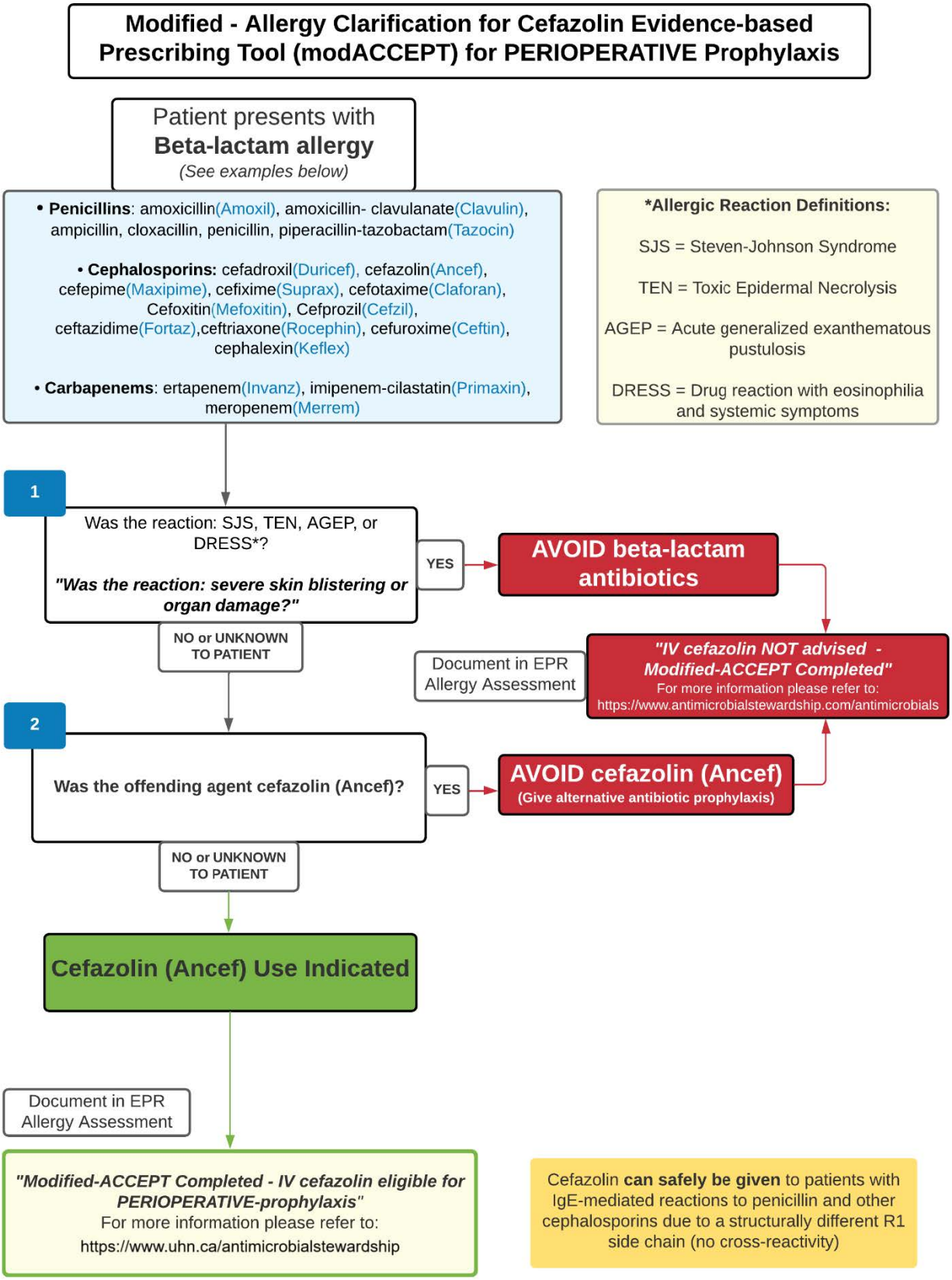
Improving Surgical Antimicrobial Prophylaxis:
The modACCEPT Tool and Frequently Asked Questions



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Background

Penicillin allergy is the most commonly reported allergic reaction. [1–7]

Despite a prevalence of 10%, only about 1% of the population is truly allergic to penicillin when tested. Cefazolin allergy is uncommon and because of differences in the side chain compared to other beta-lactams, cross-reactivity is not expected.

In a recent systemic review and meta-analysis of patients with a penicillin allergy, only 0.7% of surgical patients receiving cefazolin reported a reaction. This is equal to or lower than the risk of cefazolin allergy in the general population. Despite this, many surgical patients receive alternative antimicrobials when a penicillin allergy label is in the chart.

The impact of this allergy is significant leading to alternative antimicrobial use (which carries increased odds of developing Surgical Site Infections), longer pre-operative infusion times and higher workload. **The following "frequently asked questions" address some common issues clinicians encounter when assessing suitability for cefazolin-based surgical antimicrobial prophylaxis (SAP).**

Frequently Asked Questions:

1) *What type of allergies or reactions might people have to antimicrobials?*
   - Type 1 hypersensitivity reactions (i.e. anaphylaxis)
   - Severe non-type I hypersensitivity reactions including Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis, serum sickness, thrombocytopenia, renal dysfunction, hepatic dysfunction, and/or anemia. These reactions are often collectively referred to as Severe Cutaneous Adverse Reaction (SCAR).
     - An isolated maculopapular rash is usually classified as a non-severe, non-type 1 hypersensitivity reaction.
   - Intolerance: non-allergic adverse effects that include nausea, vomiting, diarrhea, or lack of efficacy.

2) *Is cefazolin safe to give to patients who report a beta-lactam allergy?*
   - YES: If **Type 1 hypersensitivity** (anaphylaxis) to other non-cefazolin beta-lactams. The different side-chain of cefazolin make cross-reactivity with other beta-lactam allergies very unlikely and equivalent to the population level risk of beta-lactam allergy.
     - *Note: Approximately 3% of patients who have a **skin test-proven allergy to penicillin** may also react to cefazolin (a.k.a. dual allergy). This is not a contraindication to receiving cefazolin but will be taken into account by the perioperative anesthesia and surgical teams.*
   - YES: If patients have an **intolerance** to non-cefazolin beta-lactams. Prior intolerance to other non-cefazolin antimicrobials does not increase the chance for a cefazolin-mediated reaction.
   - NO: If patients had a **severe non-type 1 hypersensitivity reaction to any beta-lactam** beta-lactams including cefazolin should be avoided until formalized allergy assessment has been obtained.

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3) *What if my patient is uncertain about the type, severity or exact antibiotic cause of the reaction they experienced in the past?*
   - Reported beta-lactam allergy without recall of specific details including the need for targeted treatment makes severe allergic reaction unlikely. Cefazolin can safely be used in patients uncertain of the timing, type, or severity of an allergic reaction.
   - Beta-lactam allergy may wane with time. In patients with true Type 1 hypersensitivity reactions, 80% will not react to the same antimicrobial after 10 years [8].
   - Cefazolin is an intravenous only medication. If a patient reports a reaction to an unknown oral cephalosporin or other beta-lactam, cefazolin is still likely an acceptable choice (see caveats in question 2).

4) *What if my patient just reports a rash to beta-lactam antibiotics?*
   - Mild type 4 hypersensitivity (usually an isolated maculopapular rash) is not a contraindication to receiving cefazolin.
   - If desquamating rash or rash associated with other systemic symptoms, **cefazolin should be avoided.**

5) *What happens after the modACCEPT tool is complete?*

   - Once the modACCEPT tool is complete, the output of the tool, either:
     - Modified-ACCEPT Completed - IV cefazolin eligible for PERIOPERATIVE prophylaxis.For more information please refer to: https://www.uhn.ca/antimicrobialstewardship
       OR
     - IV cefazolin NOT advised – Modified ACCEPT Completed. For more information please refer to: https://www.uhn.ca/antimicrobialstewardship

     Is cut and pasted into the "Additional Symptom" box in the EPR allergy field of the beta-lactam entered as an allergy.
   - This information is used by the anesthesiologist, nurses in the pre-operative care unit (POCU) and surgeon to provide optimal surgical antimicrobial prophylaxis for this patient on the day of surgery.
   - By completing this tool, you are not ordering or recommending cefazolin as a prophylaxis regimen. Further information gathering and patient assessment is completed by other clinicians to determine the most appropriate prophylaxis for this patient.

6) *What about non-elective/emergent patients with self-reported allergies to beta-lactams?*

   - Patients who are admitted via the emergency department or electively onto the floor without being seen in the pre-admission clinic (PAC) first will not have the modACCEPT tool completed at this time. This will be revisited in the future as workflow permits.
   - All patients will be seen by the peri-operative anesthesia team and assessed for optimal antimicrobial prophylaxis at the time of their operation whether admitted electively or emergently.

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References and Additional Resources:

1 Shenoy ES, Macy E, Rowe T, *et al.* Evaluation and Management of Penicillin Allergy: A Review. *Jama* 2019;**321**:188. doi:10.1001/jama.2018.19283

2 Lam PW, Tarighi P, Elligsen M, et al. Impact of the Allergy Clarification for Cefazolin Evidence-based Prescribing Tool on Receipt of Preferred Perioperative Prophylaxis: An Interrupted Time Series Study. *Clin Infect Dis* 2020;**71**:2955–7. doi:10.1093/cid/ciaa516

3 Sousa-Pinto B, Blumenthal KG, Courtney L, et al. Assessment of the Frequency of Dual Allergy to Penicillins and Cefazolin. *Jama Surg* 2021;**156**:e210021. doi:10.1001/jamasurg.2021.0021

4 Vorobeichik L, Weber EA, Tarshis J. Misconceptions Surrounding Penicillin Allergy: Implications for Anesthesiologists. *Anesthesia Analgesia* 2018;**127**:642–9. doi:10.1213/ane.0000000000003419

5 Lam PW, Tarighi P, Elligsen M, et al. Self-reported beta-lactam allergy and the risk of surgical site infection: A retrospective cohort study. *Infect Control Hosp Epidemiology* 2020;**41**:438–43. doi:10.1017/ice.2019.374

6 Blumenthal KG, Ryan EE, Li Y, et al. The Impact of a Reported Penicillin Allergy on Surgical Site Infection Risk. Clin Infect Dis 2017;**66**:329–36. doi:10.1093/cid/cix794

7 Wilhelm NB, Bonsall TJ, Miller CL. The Effect of Beta-lactam Allergy Status on the Rate of Surgical Site Infections: A Retrospective Cohort Study. *Ann Surg* 2020;**Publish Ahead of Print**. doi:10.1097/sla.0000000000003949

8 Trubiano JA, Adkinson NF, Phillips EJ. Penicillin Allergy Is Not Necessarily Forever. Jama 2017;**318**:82–3. doi:10.1001/jama.2017.6510