

Penicillin allergy cross-reactivity

- Roughly 10% of the population report allergy to penicillin
- Penicillin is a beta-lactam antibiotic and can therefore cross-react with other beta-lactam antibiotics
- Beta-Lactam Antibiotics
 - Penicillins
 - Amoxicillin
 - Amoxicillin/Clavulanic Acid (Augmentin)
 - Ampicillin
 - Ampicillin/sulbactam (Unasyn)
 - Penicillin (Pen G, Pen VK)
 - Piperacillin/Tazobactam (Zosyn)
 - Nafcillin
 - Methicillin
 - Cloxacillin/Dicloxacillin
 - Ticarcillin/Clavulanate potassium (Timentin)
 - Cephalosporins
 - 1st Generation
 - Cefazolin
 - Cephalexin (oral)
 - Cefadroxil (oral)
 - 2nd Generation
 - Cefuroxime
 - Cefoxitin
 - Cefotetan
 - Cefaclor/Loracarbef (oral)
 - Cefprozil (oral)
 - Cefuroxime axetil (oral)
 - 3rd/4th Generation
 - Cefepime (4th)
 - Ceftazidime (3rd)
 - Ceftriaxone (3rd)
 - Cefotaxime (3rd)
 - Ceftizoxime (3rd)
 - Ceftobiprole (3rd)
 - Ceftaroline (3rd)
 - Cefixime (oral – 3rd)
 - Cefibutin (oral – 3rd)
 - Cefpodoxime/Cefdinir/Cefditoren (oral – 3rd)
 - Carbapenems

- Meropenem (Merrem)
- Imipinem/cilastatin (Primaxin)
- Ertapenem (Invanz)
- Doripenem (Doribax)
- Monobactam
 - Aztreonam

Penicillin allergy

- Among patients reporting an allergy to penicillin, approximately 85-90% will successfully tolerate a penicillin.
 - May never have had an allergy (empirically listed PCN as an allergy)
 - Reactions such as GI upset, mild rash are not considered to be a “true allergy”
 - Older patients who list an allergy to penicillin may have experienced a reaction decades ago at a time where medication contamination was not uncommon (i.e., reacted to contaminant and not penicillin itself)
 - May have been taking a concurrent medication which precipitated allergic reaction, but was falsely attributed to a penicillin

Cross-Reactivity Rates

- Cephalosporins
 - Cross-reactivity rates between cephalosporins and penicillin allergy range from 0.17 to 8.4%
- Carbapenems
 - Cross-reactivity once thought to be as high as 40%
 - Realistically, cross-reactivity is approximately 1%
- Monobactam (Aztreonam)
 - There have been no reports of cross-reactivity in patients with confirmed penicillin allergy

Recommendations for management in the Emergency Department

- Determine if the patient is “truly” allergic to penicillin, i.e., patient reports history of anaphylactic reaction
 - If yes, avoid penicillins, cephalosporins, and carbapenems
 - If no, penicillins, cephalosporins, and/or carbapenems may be administered with careful monitoring of airway

- To assist in determining the true nature of the allergy, the following questions should be answered by the patient
 - How old were you when the reaction occurred?
 - Can you describe the reaction?
 - When did the reaction occur? After the first dose? After the tenth dose?
 - How was the penicillin administered? Orally? Intravenously?
 - Were you taking any other medications at the same time?
 - When the penicillin was stopped, what happened?
 - Have you since taken a penicillin, cephalosporin, carbapenem, or monobactam?