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Your Guide to Understanding Penicillin Allergies

Have you been told to avoid penicillin because of an allergy? You're not alone. Many people think they're allergic to penicillin, but research shows that up to 90% of people who think they're allergic to penicillin can safely take it.

Why is this important? Understanding whether you have a true penicillin allergy could open up more effective and affordable treatment options for you. Alternative non-penicillin drugs are often more costly and can have other adverse side effects.

In this brochure, you'll learn what a penicillin allergy really is, how it's diagnosed, and what steps to take if you think you're allergic.

What is Penicillin?

Penicillin is a type of antibiotic that fights bacterial infections. It belongs to the family of beta lactam antibiotics which includes ampicillin, amoxicillin, and cephalosporins, among others. Famously discovered by Nobel prize recipient Sir Alexander Fleming in 1928, penicillin was initially used in wounded soldiers in World War II and became the first antibiotic to be widely used in civilians and remains one of the most prescribed medications due to its effectiveness and safety.

Penicillin works by killing bacteria or stopping them from growing. It's often used to treat mild to severe infections like strep throat, sinus and ear infections, pneumonia, meningitis, and blood stream infections. It is the most effective antibiotic for the treatment of syphilis.

Despite its widespread use, up to 10-20% of Americans report a penicillin allergy, although more than 90% of these people are not truly allergic.

What is a Penicillin Allergy?

Because antibiotics including penicillin are foreign substances, the human immune system may overreact, mistaking it for a harmful substance. Not everyone exposed to penicillin develops an allergy and risk factors for developing a penicillin allergy are not well understood; however, genetics may play a role. If you are allergic, your body produces antibodies or immune cells that recognize penicillin, triggering a reaction that can range from mild to severe. However, not all reactions to penicillin are true allergies. Common side effects like nausea, diarrhea, or thrush don't indicate an allergy. True reactions occur immediately or within one hour of exposure and are called immediate reactions. Delayed reactions can occur within days of exposure.

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Here are the common signs of a true immediate penicillin allergy:

- **Itchy skin rash:** The most common sign of a penicillin allergy is often a raised and bumpy rash known as hives, which is fleeting and can be very itchy.
- **Swelling:** This could occur on your face, lips, tongue, or throat, which can impair breathing.
- **Breathing problems:** Wheezing, shortness of breath, or tightness in your chest. This can feel similar to an asthma attack.
- **Anaphylaxis:** This is a severe, life-threatening systemic allergic reaction that requires immediate medical attention and the use of epinephrine. More than one organ system is usually involved and may include difficulty breathing due to lung or throat impairment, nausea and/or vomiting, dizziness with a drop in blood pressure, a feeling of impending doom, or even loss of consciousness.

Delayed reactions typically occur 24 hours to 2 weeks after penicillin treatment and include:

- Non-dangerous and non-itchy rashes that can be localized or spread in the body. Of note, similar rashes often occur in children due to viral and bacterial infections and can be mistaken for penicillin allergy.
- Severe rashes associated with systemic symptoms such as fever, liver inflammation, skin blisters and painful mouth or genital ulcers and changes in blood cell counts.

Could Your Allergy Be Misdiagnosed or Gone?

Many who think they're allergic to penicillin have experienced side effects which are not a true allergy. Penicillin allergy can also be lost over time and people who had a mild allergy as a child are usually found years later to be no longer allergic.

Other reasons for carrying a penicillin allergy label include:

- **Side effects mistaken for allergies:** Side effects like nausea, vomiting, or diarrhea are common but are not true allergies.
- **Childhood reactions:** Many children develop rashes related to viral or bacterial infections, or experience mild reactions to medications that are unrelated to allergies. These are often misinterpreted as allergies and can stay in a medical chart years after the reaction.
- **Other medications:** If you take multiple medications at once and have a reaction, it could be due to another medication – not penicillin.

How is a Penicillin Allergy Diagnosed?

Your doctor will conduct a thorough history and physical exam, asking about your specific reaction and refer you to an allergist if penicillin allergy is unlikely and you need de-labeling.

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Referral to an allergist can also be done to confirm the allergy and protect you against further exposures by adding the allergy to your medical chart.

Common tests to address penicillin allergies:

- **Penicillin skin test:** A small amount of penicillin is placed on your skin, usually on your forearm. The skin is then pricked with a tiny needle to allow the medicine to enter just under the skin. Results of this test are generally available within 15 minutes. The allergist will compare how your skin reacts to penicillin versus a positive control (histamine) and a negative control (saline). If you are allergic, you'll likely develop a small, raised, itchy bump at the site, which lasts a few minutes. If the prick test is negative (e.g. no bump occurs), a small amount of penicillin is injected right under the skin. After another 15 minutes, your allergist will determine whether this test is positive or negative. A total test time of about 45 minutes is needed to complete penicillin skin testing. Severe reactions to skin testing are exceedingly rare. If skin testing is entirely negative, the next step is to proceed with an amoxicillin challenge.

- **Amoxicillin challenge:** Your allergist may give you one or two doses of amoxicillin by mouth. For some patients with a low-risk history (e.g. reaction in childhood in the setting of a viral or bacterial illness), we can go straight to an oral challenge without performing skin testing first. This is because the likelihood of you still being allergic is very low. You'll be monitored in the clinic for 60-90 minutes after taking amoxicillin to see if there are any allergic reaction symptoms.

If you don't have any, this indicates that you are no longer allergic to penicillin and the allergy label can be removed. This will allow you to use penicillin and other beta lactam antibiotics in the future!

What if You Are Allergic?

If you do have a true penicillin allergy, don't worry. If penicillin is the best option for treating your infection, your allergist may recommend a procedure called desensitization, which has been used for several decades to allow allergic patients to be treated with a necessary medication. This medical treatment is performed by an allergist and involves gradually increasing doses of penicillin into your body to teach it to temporarily tolerate the medication while minimizing the risk for severe reactions. Repeat desensitization is required if penicillin is needed again as desensitization does not cure or remove an allergy.

Why Knowing Matters

At some point, you may need antibiotics for an infection like strep throat, a sinus infection, or pneumonia. Many of these are best treated with penicillin-based antibiotics such as amoxicillin, ampicillin, or piperacillin, which are more effective and have fewer side effects than alternatives.

Healthcare providers want to prescribe the most appropriate antibiotic for your condition. Penicillin often works better for specific bacterial infections, especially those involving the throat, ears, and respiratory system. Pregnant women may also benefit from penicillin during labor to prevent infections.

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If you report a penicillin allergy, you might be given a broad-spectrum antibiotic. These drugs kill a wide range of bacteria, including the "good" bacteria your body needs. They are often more expensive, cause more side effects, and can contribute to antibiotic resistance, making future infections harder to treat. Knowing your true allergy status helps ensure you receive the best, safest, and most affordable care.

Can Penicillin Allergies Be Outgrown?

Many people outgrow their penicillin allergy over time. Studies show that around 80% of people lose their allergy within 10 years of their first reaction. This includes patients with history of prior immediate reactions and skin symptoms related to penicillin use. This is why retesting is important. If you haven't been exposed to penicillin in several years, your allergist may suggest that you get tested to see if the allergy is still present.

If you outgrow your allergy, you could safely take penicillin again – giving you better treatment options in the future.

If you have history of a severe delayed reaction, please consult with an allergist as some reactions cannot be outgrown and you may still need to avoid penicillins.

To learn more about allergy testing, visit acaai.org.

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If you've been diagnosed with a penicillin allergy or suspect that you might have one, please talk to your PCP and have him/her refer you to an allergist to discuss your allergy. Don't just assume you have an allergy because of a past reaction. A proper diagnosis through testing can give you a clear answer. With the right information, you can make informed decisions about your treatment and ensure that you're getting the most effective care.

When should I see an allergist?

See an allergist if you have any of these conditions. Allergists treat two of the nation's most common health problems – allergies and asthma. More than 50 million people in the United States have these allergic diseases. Although symptoms may not always be severe, allergies and asthma are serious and should be treated that way. Many people with these diseases don't realize how much better they can feel. Allergists also treat conditions with similar symptoms, such as non-allergic rhinitis.

What is an allergist?

An allergist is trained to find the source of your symptoms, treat it and help you feel healthy. Life's too short to struggle with allergies or asthma. An allergist can help you find the answers you're looking for.

After earning a medical degree, the doctor completes a three-year residency training program in either internal medicine or pediatrics. They then finish two or three more years of study in asthma, allergy and immunology. The best way to manage your allergies or asthma is to see an allergist.

American College of Allergy, Asthma & Immunology