PENICILLIN ALLERGY: FACTS FOR PATIENTS

PENICILLIN ALLERGY
Allergies to penicillin are common, with about 10 percent of people reporting an allergy. However, most people who believe they are allergic may be able to take penicillin without any adverse effects – either because they were never truly allergic or because their allergy to penicillin has resolved.

People may become less allergic to a medication over time. If not exposed to penicillin for 10 years after their initial reaction, around 80 percent of people may not experience another reaction if exposed again.

WHAT IS PENICILLIN?
Penicillin is part of a family of antibiotics known as beta lactams, however there are many individual medications that are classified under this family. They include penicillin G, cloxacillin, ampicillin, amoxicillin, piperacillin, and many more.

Anyone who is allergic to one of the penicillins is generally presumed to be allergic to all medications in this family and should avoid exposure, unless they have been specifically evaluated for this problem.

REACTIONS TO PENICILLIN
When reporting past reactions to antibiotics, it is important to provide as much detail as possible to the doctor or health care provider about the reaction. This is because symptoms vary from patient to patient, and many unexpected reactions can occur after taking penicillin.

Adverse reactions
“Adverse reaction” is the medical term for any undesirable reaction caused by a medication. Adverse reactions may be either allergic or non-allergic. Non-allergic reactions are far more common, and may include nausea, abdominal pain, and diarrhea.

It is important to distinguish non-allergic adverse reactions from true allergic reactions. If a patient reports a drug allergy, which may have only been a non-allergic adverse reaction, they may be treated with a less effective or more toxic antibiotic.

Anyone who is uncertain if a past reaction was truly caused by an allergy should speak with their health care provider before further exposure to the antibiotic.
Rashes

Several different rashes can appear while people are taking a penicillin medication:

- **Hives**: These are raised, intensely itchy spots that come and go over hours or occur with other allergic symptoms such as wheezing or swelling of the skin or throat. Hives suggest a true allergy.

- **Rashes**: Rashes typically start after several days of treatment. They are flat, blotchy, not itchy, and spread over days but do not change by the hour. They are unlikely to be the result of a dangerous allergy.

When talking to a health care provider it may be difficult to distinguish between different types of rashes that occurred in the past. It is always helpful to bring along a photograph of a rash.

Allergic reactions

Allergic reactions occur when the immune system recognizes a drug as something “foreign.” Several different symptoms may indicate an allergy to penicillin. These include hives, swelling of the tissue under the skin (often around the face), throat tightness, wheezing, coughing, and difficulty breathing. Understanding the history of these types of reactions in a patient is important because they could develop a more severe reaction if the person were to take the antibiotic again. Mild to moderate allergic reactions to penicillins occur in roughly 1 to 5 percent of people.

Anaphylaxis

Anaphylaxis is a sudden, potentially life-threatening allergic reaction. Symptoms consist of those of an allergic reaction, and may also include very low blood pressure, difficulty breathing, abdominal pain, swelling of the throat or tongue, and/or diarrhea or vomiting. Fortunately, anaphylaxis is rare.

PENICILLIN ALLERGY TESTING

The most reliable way to determine if a person is truly allergic to penicillin is allergy skin testing. Approximately ninety percent of people who think they have an allergy to penicillin will test negative, either because they lost the allergy over time, or because they were never allergic in the first place. Determining if someone can safely take penicillin is critical. Often a person with unclear allergy status is given a different antibiotic that may have more severe side effects or may be more expensive, while penicillin, a relatively safe and inexpensive antibiotic, would have been an appropriate alternative.

Penicillin skin testing does NOT provide any information about certain types of reactions. This includes severe reactions such as extensive blistering and peeling of the skin (Stevens-Johnson syndrome or toxic epidermal necrolysis); a widespread sunburn-like reaction that later peels (erythroderma); or a rash accompanied with fever and joint pain/swelling (serum sickness). People with these types of reactions should never again be given the medication that caused the reaction, and skin testing is not helpful to diagnose these conditions. This applies to all situations since a second exposure could cause a severe progressive reaction.

Skin testing should be done by an allergist, and usually takes about one hour to complete. The skin is pricked, and then injected with weak solutions of the various preparations of penicillin and observed for a reaction. This may cause discomfort due to itching, or mild bruising at the injection sites, but it is typically not very painful. A positive skin test results in an itchy, red bump that lasts about half an hour and then resolves. A positive test indicates that the person is truly allergic, and those who test positive should continue to avoid penicillins.
If a patient completes the skin testing without a positive reaction, an oral challenge to either penicillin or amoxicillin is usually given to confirm that the patient can safely take the medication. The oral dose may be needed because medical tests, including skin testing, are rarely 100 percent accurate. About three percent or less of people who have a negative skin test will still experience an allergic reaction to an oral dose. However, these reactions are generally very mild.

The oral challenge may be in 1 or 2 doses, with the total of these doses being equal to what one would normally take when under treatment. There will usually be a total observation time of 1 to 1½ hours. If a person has a negative skin test and has no reaction to an oral dose of the antibiotic, they can safely be classified as non-allergic and no future precautions are necessary.

References:

Warrington R and Silviu-Dan F. Drug Allergy. Allergy, Asthma & Clinical Immunology 2011, 7(Suppl 1):S10


From the ACAAI 2015 Drug Allergy and Anaphylaxis Committee

For more information about allergy treatment, and to locate a board-certified allergist in your area, visit AllergyAndAsthmaRelief.org.
Frequently Asked Questions (and Answers) About Penicillin Allergy

1. Who should be tested for penicillin allergy?

Anyone who has a history of an allergic reaction to a penicillin antibiotic is a candidate for penicillin allergy testing. Unless there is a past history of a previous reaction, however, testing is unnecessary. If you have never reacted to penicillin, or have never taken it, testing is not indicated.

2. Why should I be tested for penicillin now if I do not need to take the antibiotic immediately?

Testing might be done even if you have no need to use the antibiotic immediately. Penicillin is a commonly used antibiotic with a variety of applications. Demonstrating the absence of allergy now could be very helpful to you in the future, when the need might suddenly arise. Having tests done – even if there is no current need – would save you from having to have “emergency testing” if there is a need for penicillin or cephalosporins in the future. Testing may also help prevent the use of broad spectrum alternative antibiotics that may increase the possibility of antibiotic resistant organisms.

3. How is penicillin allergy testing done?

Testing is done with allergy skin tests. These are performed most commonly on either the forearm or back. Tests are done by pricking and injecting the skin. A standard puncture testing device is used for the initial testing, and a syringe and needle is employed if the test using this device is negative. The technique is the same as the one used for testing allergies to pollens and foods. The tests for penicillin allergy take about an hour and are relatively painless.

More information on penicillin allergy testing can be found on the The American College of Allergy, Asthma, and Immunology (ACAAI) website, www.AllergyAndAsthmaRelief.org.

4. How should I prepare for skin testing to penicillin?

No complicated preparation is needed. You should, however, discontinue antihistamines and other drugs prior to testing as they may affect the test results. If you have any doubt about a drug you are taking, contact your allergist as soon as possible prior to testing to learn what drug(s) should be stopped, and for how long. It is best to avoid all antihistamines for 7 days prior to testing. Your allergist may allow some antihistamines to be taken up until 2-3 days prior to testing if you feel you cannot stop them for one week. The need to discontinue antihistamines applies not only to oral antihistamines but also to antihistamine nasal sprays (e.g., azelastine or olopatadine). If you take medications for depression, anxiety, or migraines, please discuss with your allergist prior to testing, as some of these may need to be discontinued.
If I have a negative test to penicillin, can I automatically take a cephalosporin, if I have never had a reaction to a cephalosporin?

The vast majority of people who have negative tests to penicillin will be able to tolerate a cephalosporin. Without a previous reaction to a cephalosporin, it is not necessary to be tested or challenged to a cephalosporin.

Should patients with a history of cephalosporin allergy who have not subsequently taken penicillin or cephalosporin be tested for cephalosporin or penicillin?

Cephalosporin allergy is not as well-studied as penicillin allergy, and skin testing to standardized reagents is not available. This means that all allergists do not necessarily advise the same type of evaluation. Some allergists may recommend skin testing to non-standardized reagents for cephalosporin and/or standardized penicillin testing followed by an oral challenge. Others may suggest an oral challenge only to one or both medications, depending upon your specific history of reaction and the drug to which you reacted. You will need to discuss these issues with your allergist.

Are people with hay fever and/or asthma more likely to be allergic to penicillin or cephalosporin?

Most studies have shown that patients who have allergies are not at any increased risk of developing penicillin or cephalosporin allergy.

What are the signs and symptoms of penicillin allergy?

People who are allergic to penicillin usually have symptoms consisting of the following:

- Hives (red welts).
- Swelling of parts of the body, usually the lips, eyes, tongue, hands, or feet. Swelling usually occur simultaneously with the hives.
• Shortness of breath or wheezing.
• In severe reactions, fainting can occur.

These symptoms usually appear shortly after the ingestion of the drug. It is important to note that other reactions such as a measles-like rash can occur. These reactions are usually delayed in onset (several days after the initial dose). Skin testing does not predict whether these delayed reactions will occur.

13. How often are penicillin reactions fatal?

We have no definitive information on the exact percentage of fatal reactions, but fatalities have been recorded.

14. If I had a delayed onset, measles-like rash from penicillin, should I take penicillin again?

Delayed reactions are more difficult to assess and they may or may not reoccur on subsequent courses of penicillin. At times the rash may have been caused by the infection (for which the antibiotic was prescribed) and not the antibiotic. It is unlikely that if you were to receive penicillin again that you would have a life-threatening reaction. But it is possible that you could have a delayed-onset rash. Before you take penicillin again, consult an allergist and review your history. Some allergists may suggest different types of testing, or a controlled challenge, but this will depend upon your history.

References:


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I might be allergic to Penicillin. Why should I get tested?

Why can’t I just avoid taking all penicillin drugs?

If you’ve been told at some point that you have a penicillin allergy, you may want to know why you should be tested by an allergist to make sure. Why can’t you just take a different drug – one that doesn’t contain penicillin? While you are concerned with your personal health, and the best treatment for you and your family, you probably also understand that preventing drug resistance in the United States is an important societal problem. It is also critical to recognize that the best treatment for many of the most common infections is a penicillin medication.

Acute sinusitis (Sinus Infection):

About one in seven people in the United States has a sinus infection every year. While most are caused by a virus, up to 2 percent of people develop a secondary bacterial infection. Many patients seen by a primary care physician for an acute sinus infection are given an antibiotic, even though they may not have a bacterial infection. A lot of patients request an antibiotic, believing that they will recover more quickly – even if they have a viral infection. Because taking nose cultures or doing blood tests are not accurate diagnostic tools for a sinus infection, doctors try to select the best medication based on the most common causes of infections.

Medications for sinus infection: Recommended and Not Recommended

- **Amoxicillin/clavulanate potassium (Augmentin):** A type of penicillin used for both children and adults, and the preferred treatment for an acute sinus infection that requires antibiotics.

- **Cephalosporins (Keflex or Ceftin):** Considered second line medications for the treatment of an acute sinus infection, due to the resistance of S. Pneumoniae to these drugs.

- **Azithromycin (Zithromax):** Also known as “the macrolides,” these are not recommended for the treatment of a sinus infection because they may fail to work up to 40 percent of the time if the infection is caused by S. Pneumoniae. Not only will the use of an ineffective antibiotic likely fail to cure the infection, but it also encourages the growth of more resistant bacteria in the community at large.

- **Flouroquinolones (Levaquin or Cipro):** Not recommended, as these are the drugs used for serious infections, and if they are overused, we will start to see the development of resistance to this group of antibiotics by organisms causing sinusitis.
Alternatives for penicillin-allergic adults:

One alternative antibiotic for penicillin-allergic adults is doxycycline, but it should not be used for children. Likewise, fluoroquinolones are not recommended for routine use in children younger than 18 due to the possible development of joint problems. Neither doxycycline nor fluoroquinolones should be taken during pregnancy.

Acute otitis media (Ear infection):

Eradications are the most common diagnosis for children visiting a medical clinic, and the most common reason for being given an antibiotic. While an ear infection can occur at any age, it is most common in infancy. Between 60-80 percent of children will have one ear infection by age one, and 80-90 percent will have at least one ear infection by age three. Not all ear infections require an antibiotic, but when one is needed, the treatment must address the most common causes of the disease. S. Pneumoniae, responsible for 50 percent of ear infections and H. Influenzae, responsible for 45 percent, are the same organisms as those responsible for sinus infections.

Medications for ear infections:

In children who require antibiotics for an ear infection, amoxicillins are the preferred drugs. The macrolides, clarithrymycin (Biaxin) or azithromycin (Zithromax), don’t work against most H. Influenzae or about one-third of S. Pneumoniae infections.

Other diseases:

Augmentin is also considered a first line drug for Chronic Obstructive Pulmonary Disease (COPD) related lung infections, bacterial pneumonias, skin abscesses, diabetic foot infections, pharyngeal Group A Streptococci chronic carrier state, animal and human bites, and kidney infections.

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