# Allergy Skin Testing: What Nurses Need to Know

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**KEYWORDS**

• Skin tests • Patch test • Allergy • Allergy testing

Skin testing is a common procedure in any clinical setting, and a practice that all health care providers have experienced as either the tester or the individual being tested for allergies, or as a screen for infectious diseases such as tuberculosis. Critical care nurses will encounter skin testing in the inpatient and outpatient settings primarily to test for patient allergies to environmental factors, or allergies to certain medications. Testing for allergies should always follow a thorough history and physical examination, as the skin tests are used to confirm or exclude allergies. At present there is a great deal of controversy about standard practices surrounding the different tests, and although there is some current research on skin testing, there is overall a lack of evidenced-based standard protocols for administering and interpreting the results of skin tests. There are many patient variants, and testing variants that can impact the results of the tests as well as the reliability and usefulness of the results. Information about allergy tests and testing will lead the nurse toward important considerations when administering, interpreting, and teaching the patient about allergy skin testing.

The first documented skin test is credited to Charles H. Blackley, a physician with chronic allergic rhinitis.[1] He abraided his skin with a lancet and applied wet lint soaked in grass pollen to the area, which resulted in severe itching and a large cutaneous response.[1,2] Today, there is not much departure from the principles that were first used by Blackley. Awareness of the controversies and the positive and negative aspects of the predictive value of any skin test are paramount. In addition, skin testing must be considered with regard to the patient's history and physical status. The interpretation of the test is contingent on many factors. Factors that warrant consideration include the type of skin testing, the device used to test the skin, the placement of the

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test on the patient's body, the substance being used to test the skin, the potential interferences such as medications that may suppress the skin response, and parameters relating to the interpretation of the tests.

## METHODS OF SKIN TESTING

Skin tests may be performed using either a prick or puncture (percutaneous), and can be performed by intradermal (intracutaneous) techniques or through patch testing, in which the extract is applied directly to the skin (epicutaneous). Intradermal testing is more sensitive than prick or puncture testing. For reactions to be equivalent, it takes about 1000-fold concentrate extract for skin prick testing.[1,3–5] Patch testing essentially uses the theory that a localized, confined, immune-mediated reaction to the extract can be elicited by introducing the agent transdermally. There continue to be ongoing studies about the efficacy of patch testing not only for allergy but also as the basis of evidence for diagnosing such conditions as anticonvulsant hypersensitivity syndrome.[6] The efficacy of patch testing versus other methods has also been studied in patients with nickel allergies.[7] **Table 1** shows a comparison between the commonly used percutaneous (prick puncture) method and the intradermal method of skin testing.

### *Skin Testing Devices*

Although intradermal tests are performed using only a hypodermic needle and syringe, prick or puncture tests may be performed with a variety of devices. Some devices have a single stylus with several points, whereas others have multiple heads that allow up to ten tests to be performed at once.[3] The major concerns with the multihead devices involve the amount of trauma to the patient and issues with interpretation. Because of the variations in these devices, the proximity of the control to the allergen differs and there is a possibility of getting a false-positive result at the site of a negative control. In contrast, differences in application devices could produce a false-negative response.[3,8–10] Negative and positive controls are helpful in the interpretation of the allergen tests themselves, and are particularly important when using a multihead device.

**Table 1**
**Comparison of intracutaneous (intradermal) and percutaneous route (prick or puncture) methods**

| Percutaneous Route (Prick or Puncture) | Intracutaneous Route (Intradermal) |
|---|---|
| Safer | More sensitive |
| Easy to administer | More reproducible |
| Rapid | Less specificity in testing |
| Little discomfort | Greater risks for systemic reactions (including fatalities) |
| Able to distinguish multiple allergies at one time | Useful in determining anaphylaxis, especially if caused by medication or venom |
| Steeper dose response curve | |
| Better correlates with clinical symptoms | |
| Preferred technique for IgE-mediated hypersensitivity | Late-phase cutaneous responses are more likely to occur. This response is characterized by erythema, induration or edema, and dysesthesia |
| Generally favored for initial screening due to fewer systemic reactions | |