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Patch testing: Facts and controversies

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Abstract The German dermatologist, Josef Jadassohn (1863-1936), first presented the results of his innovative patch-testing technique in 1895. The safety and efficacy of this diagnostic tool has stood the test of time and is still the gold standard for the diagnosis of allergic contact dermatitis (ACD).

Since its discovery, much effort has been put into standardization and optimization of allergens, vehicles, and concentrations of patch-test materials; in procedures of its application; and in reading and scoring of test reactions—all contributing to the development of an accurate, reliable, and safe test with a high reproducibility of its results. Even this seemingly carved-in-stone practice, which has been used for nearly 120 years, has been questioned and challenged, engendering debates, disagreements, and controversies, which show no signs of coming to an end.

Almost every step of the procedure has provoked discussions and controversies:

- Who should be patch-tested?
- What should be the criteria for referral of patients to a patch-test clinic?
- What are the criteria for including an allergen in the standard patch-test series?
- Which chambers should be used in terms of size, material, and shape?
- What is the optimal occlusion time?
- What is the optimal test-reading time?
- What is the best way of scoring patch-test reactions?
- How should the relevance of positive patch tests be classified? (This latter issue, which is the crucial and most complex and tricky phase of the process, has paradoxically not created more controversies than other apparently less problematic parts of the procedure.)

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Patch testing: More than 100 years of use and still controversial

The German dermatologist, Josef Jadassohn (1863-1936), first presented the results of his innovative patch-testing technique in 1895. The safety and efficacy of this diagnostic tool has stood the test of time, and is still the gold standard for the diagnosis of allergic contact dermatitis (ACD).[1,2] Since its discovery, much effort has gone into understanding the chemical and toxicologic aspects of test allergens, in standardization and optimization of allergens, vehicles, and concentrations of patch-test materials, in procedures of its application, as well as in reading and scoring of test reactions—all contributing to the development of an accurate, reliable, and safe test with a high reproducibility of its results. What, then, is the controversy all about? **Who should be patch tested?**

In 1931, Sulzberger and Wise[3] supported patch testing in cases of eczema and dermatitis, as the sole means of unearthing the etiologic factors and the nature of the condition. In a later contribution, Sulzberger[2] stated, "The patch test has aided patients and physicians to discover the specific causes in innumerable cases of allergic eczematous contact dermatitis, and because allergic contact dermatitis is such a common disease, the patch test is one of the most useful diagnostic tools available today. The test is seemingly so simple that one wonders why it was not employed in medicine until about 1895 when Joseph Jadassohn's publication introduced it into dermatologic practice." In 1981, when asked what he felt were the five most important advances in clinical dermatology during the 20th century, Sulzberger said, "The increased use and usefulness of the patch test and the international standardization of test concentrations and methods" was number 1[4] Those of us who are enthusiastic patch testers and are fascinated by the evaluation of patients with irritant and allergic contact dermatitis would agree.[5] In 1982, Colman warned that the greatest abuse of patch testing is failure to use it.[6] In his book, Fisher concluded that "Properly applied and correctly interpreted patch tests are, at present, the only scientific 'proof' of allergic contact dermatitis."[7] He also cautioned that education in the technique of patch testing is as essential to physicians-in-training as is learning about most surgical procedures. "Every case of dermatitis should be regarded as a case of cell-mediated immunity until proved otherwise. The most appropriate test is the closed patch test. It is a 'practical' test not intended to have the quantitative precision of the fine measurements of a research procedure. The greatest hazard is omission of patch-testing procedures in the management of patients who have certain dermatoses. … Complications from patch tests with a standard series are rare and are no excuse for the omission of this valuable test procedure."[7]

The enthusiastic past and present patch testers recommend performing the test on every patient suffering from any kind of dermatitis or eczema (which often are used synonymously), as well as for many other undetermined dermatoses. According to the protagonists of the method, the more you perform it the greater the chances to help your patients and to improve their quality of life. We, respectfully, consider that such an approach is exaggerated, impractical, and probably not in the best interests of at least some of our patients. The question of whom to test continues to provoke discussion and controversy, and the answer remains elusive.

An old rule of thumb is that the appropriate use of patch testing should yield a positive test result between 30% and 65% of the time. If one is getting more than 60% positive patch-test reactions, they are doing too few patch tests, and less than 30% positive reactions probably reflects excessive testing.[5,8,9] This rule falls short of meeting current needs or providing guidelines for the future, but it can serve to evaluate performance to date.

Rajagopalan et al[10] evaluated the cost-effectiveness of patch testing in patients suspected of having ACD in terms of their quality of life (QoL). The authors found that it was most cost-effective and reduced the cost of therapy in patients who had severe ACD. There were greater improvements in QoL in patients with recurrent/chronic ACD who were patch-tested compared with patients who were not; however, even in this study, the data showed that the approach to patch testing all, or nearly all, such patients probably reflects overuse from a QoL effectiveness standpoint, because less than 50% of patients with chronic or recurrent ACD in some dermatology practices apparently can be expected to have good prognoses without patch testing. The conclusion of this study,[10] that QoL benefits from patch testing, appeared to be influenced by patient-selection processes that guide treatment allocation, and that optimal effectiveness is reached at some point between 50% and 100% of use.

Another study[11] that addressed the question of whether the effect of patch testing on QoL depends on test results, noted that patients confirmed as having relevant positive contact allergens had significant improvement in both perceived eczema severity and Dermatology Life Quality Index at 2 months after patch testing. This improvement was not noted in patients with negative patch tests; moreover, there was no significant variation in QoL associated with the body site affected by eczema.

The benefits of patch testing in terms of morbidity, QoL, patient satisfaction, and economical/financial aspects are not altogether clear. The $1 million question remains: Who should be patch tested? A set of criteria is needed to provide a balance between performing excessive numbers of patch testing and reaching the large numbers of individuals whose positive patch test results would direct the choice of appropriate treatment.

One very sound approach has been suggested by a contact dermatitis (CD) unit in Manchester, United Kingdom[12] This clinic is unusual because it has a centralized unit to which all consultant dermatologists refer their patients and enables them to audit each consultant's referral pattern, retrospectively. The authors analyzed data of 10 consultants over a period of 17 months, and the results showed no significant difference between those consultants in the percentage of relevant positive individuals identified as having CD. There was a very clear linear relationship between the number of individuals with relevant ACD and the number of patients