

Compilation of International Standards for Patch Testing Methodology and Allergens

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Background: Recommendations for patch testing methodology and allergens differ between contact dermatitis groups worldwide. Currently, there is no compilation of these recommendations.

Objective: This study aims to summarize the current recommendations for patch testing methodology and allergens.

Methods: Data was collected through a literature search and by contacting representatives from 24 known contact dermatitis groups.

Results: Thirteen groups responded to our inquiry. As expected, recommendations for allergens and methodology varied between different groups; however, most groups based their recommendations on the European baseline series. We have compiled tables of methodologies and commonly tested allergens.

Conclusion: The differences between groups underscore the need for further international collaboration among contact dermatitis groups.

SEVERAL INTERNATIONAL CONTACT DERMATITIS RESEARCH groups publish recommendations for patch testing methodology and standard allergen panels. These recommendations vary greatly from group to group, and there is currently no resource that unifies this information in a manner that is universally accessible. Recommendations from these groups are scattered throughout many different publications in various languages. This lack of cohesiveness is a major barrier to large comparative epidemiologic studies.

We compare differences in testing methodology and determine the most common standard allergens among different groups. We suggest that future updates and recommendations may be published electronically, which could help bridge geographic and linguistic barriers and promote the dissemination of knowledge.

Materials and Methods

A literature search was performed by querying PubMed for articles containing the key words “patch testing” and “contact dermatitis” or the names of countries and contact dermatitis groups.¹ To supplement and corroborate the information gathered in the literature search, representatives from 24 contact dermatitis groups were asked by E-mail to provide information on the standard methodology and allergen panels of their respective groups. Thirteen groups responded.

Results

Information on patch testing methodology (Table 1) and a list of standard allergens were obtained for the 13 contact dermatitis research groups that responded to our E-mail inquiry. It is clear that patch testing methodology differs among regional groups.

Standard allergens also varied between groups. Most of the groups surveyed based their standard series on the European baseline series (EBS) put forth by the European Environmental Contact Dermatitis Research Group and the European Society of Contact Dermatitis (ESCD).² The International Contact Dermatitis Research Group (ICDRG) also supports this baseline series, and several studies have presented patch-test results using the EBS.^{3,4} Based on standard allergen series from the 13 respondent groups, we compiled a table of allergens that appeared in the recommendations of at least seven groups (Table 2).

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Table 1. Patch Testing Methodology

<i>Group</i>	<i>Reference</i>	<i>Method</i>	<i>Occlusion (d)</i>	<i>1st Reading (d)</i>	<i>2nd Reading (d)</i>	<i>3rd Reading (d)</i>	<i>No. of Allergens</i>
Australasian College of Dermatologists	8	Finn Chambers*	2	2	3	7	29
Brazilian Contact Dermatitis Study Group	9	Finn Chambers*	2	2	4	—	30
British Contact Dermatitis Group	10	Finn Chambers*	2	2	4	—	34
Peking University Department of Dermatology	11, 12	IQ Chambers [†]	2	2	3	—	20
Danish Contact Dermatitis Research Group	13	Finn Chambers*	2	2	3–4	7	23
European Environmental Contact Dermatitis Research Group	4	Finn Chambers* or T.R.U.E. Test [‡]	2	2	3–5	7	26
Finnish Contact Dermatitis Research Group	14	Finn Chambers*	2	2	3–4	5–6	30
German Contact Dermatitis Group	15	Finn Chambers*	1–2	1–2	3	As needed	27
North-East Italy Contact Dermatitis Group	16	Curatest F [§]	2	2	3–5	—	35
Dutch Contact Dermatitis Research Group	17	Van der Bend square chambers	2	2	3–4	7	45
North America Contact Dermatitis Group	18, 19	Finn Chambers*	2	2–3	4–7	—	65
Portuguese Contact Dermatitis Group	20	Finn Chambers*	2	2	3–4	—	25
Swiss Contact Dermatitis Research Group	21	Finn Chambers*	2	2	3	—	25

*Epitest Ltd Oy, Tuusula, Finland.

[†]Chemotechnique Diagnostics, Malmö, Sweden.

[‡]Mekos Laboratories A/S, Hillerød, Denmark.

[§]Lohmann-Rauscher, Neuwied, Germany.

^{||} Van der Bend BV, Brielle, the Netherlands.

Discussion

Previously, we proposed an international electronic collaboration that would provide up-to-date information about the suggested procedures for patch testing and allergen panels of various contact dermatitis groups. The variations and disagreements in methodology and standard allergens noted here underscore the need for such collaboration between groups. This compilation of previously scattered data is a first step toward collaboration (see Tables 1 and 2).

The following are important points regarding the information given in Table 1: (1) all groups except the German Contact Dermatitis Group require 48-hour occlusion; (2) surface areas (mass/cm²) are different because various chambers are used; (3) there is some variance between groups in regard to second and third

reading days; (4) the North American Contact Dermatitis Group (NACDG) and the Dutch Contact Dermatitis Group use many more allergens than do the other groups; (5), methodology and standard allergens could not be ascertained for all 24 of the existing contact dermatitis groups; and (6) the European Environmental Contact Dermatitis Research Group and the ESCD currently adhere to the same EBS.⁴

It is our hope that unified information about international variations in patch testing methodology will encourage possible regulatory or certifying bodies (eg, the Food and Drug Administration) and practicing physicians to revise and standardize their practices. Through effective electronic collaboration, this goal is achievable. We previously discussed the specific aims of such a partnership.⁵

Table 2. Most Common Allergens*

Allergen	Recommended by Particular Groups [†]												
	North												
	Australia	Brazil	China	Denmark	Europe	Finland	Germany	Italy	Netherlands	America	Portugal	Switzerland	UK
Colophony	X	X	X	X	X	X	X	X	X	X	X	X	X
Epoxy resin	X	X	X	X	X	X	X	X	X	X	X	X	X
Formaldehyde (formalin)	X	X	X	X	X	X	X	X	X	X	X	X	X
Fragrance mix I	X	X	X	X	X	X	X	X	X	X	X	X	X
Nickel sulfate	X	X	X	X	X	X	X	X	X	X	X	X	X
Potassium dichromate	X	X	X	X	X	X	X	X	X	X	X	X	X
Thiuram mix	X	X	X	X	X	X	X	X	X	X	X	X	X
Balsam of Peru	X	X	—	X	X	X	X	X	X	X	X	X	X
MCI	X	X	—	X	X	X	X	X	X	X	X	X	X
Cobalt chloride	X	X	—	X	X	X	X	X	X	X	X	X	X
Lanolin alcohol	X	X	—	X	X	X	X	X	X	X	X	X	X
Paraben mix	X	X	X	X	X	—	X	X	X	X	X	X	X
4-tert-Butylphenol formaldehyde resin	X	X	—	X	X	X	X	X	X	X	X	—	X
Benzocaine/caine mix	X	X	X	X	X	X	—	X	X	X	X	—	X
Mercapto mix	X	X	X	X	—	X	X	—	X	X	X	X	X
4-Phenylenediamine	X	X	—	X	X	X	—	X	—	X	X	—	X
Neomycin sulfate	X	X	—	X	X	X	—	X	X	X	X	—	X
2-Mercaptobenzo- thiazole (MBT)	X	X	—	X	X	X	X	X	X	X	—	—	X
Quaternium-15	X	X	—	X	X	X	—	—	X	X	X	—	X
Ethylenediamine dihydrochloride	X	X	X	—	—	—	—	X	X	X	X	—	X
Methyldibromo- glutaronitrile	—	—	—	—	X	X	X	X	X	X	—	X	X
N-isopropyl-N- phenyl-4- phenylenediamine (IPPD)	—	—	—	X	X	—	X	X	X	X	—	X	X
Sesquiterpene lactone mix	X	—	X	X	X	—	—	X	X	X	—	—	X
Tixocortol-21- pivalate	X	—	X	—	X	X	—	X	X	X	—	—	X
Budesonide	X	—	—	—	X	X	—	X	X	X	—	—	X
Primin	X	—	—	X	X	X	—	X	X	—	—	—	X
Quinoline mix/ clioquinol	X	X	—	X	X	—	—	—	X	—	X	—	X

MCI = methylchloroisothiazolinone.

*Allergens listed are those recommended for patch testing by at least 7 of 13 contact dermatitis groups.

[†]An “X” indicates that the particular group recommends the specified antigen. (We recommend that some of these more commonly featured allergens be considered for possible inclusion in a future international baseline series.)

Furthermore, although it is reasonable for allergen panels to contain specific regional allergens, there should be a standard baseline panel—a basic minimum panel that all countries should include (as opposed to a standard series, which refers to the specific series put forth by a given group). For example, the T.R.U.E. Test patch test kit (Mekos Laboratories A/S, Hillerød, Denmark), the only patch test kit approved by the US Food and Drug Administration, contains only a fraction of the allergens recommended by the NACDG and the ICDRG.^{6,7} The allergen frequency table presented as Table 2 is a strong first step toward compiling a widely used baseline allergen series.

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