the Patch Tester

Contact Dermatitis | Haptens | Patch Testing

Edition #22
December 2025

THE PTDS ISSUE

"The Patch Tester" is an e-magazine from Chemotechnique to the Patch Testers of the world.

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CHEMOTECHNIQUE DIAGNOSTICS

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PURPOSE

The Patch Tester is an e-mag developed by Chemotechnique to serve as an information resource for all Patch Testers and other Dermatologists around the world; not just in Sweden, or Europe, or America, but wherever the English language can be read and understood. This twentysecond issue comprises 36 pages with various different topics and features. Ultimately, we plan for The Patch Tester to become the forum for all of us to communicate and cooperate, in all directions.

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ACKNOWLEDGEMENTS

Production Editors:
David Alsheimer-Niklasson & Steve Lee

Patch Tester Update

The Patch Tester e-mag is now in its 22nd edition, after its launch date of December 2019, so is now in its 6th year under the editorship of David Alsheimer-Niklasson and Steve Lee.

Over the years we have received much positive feedback from the mailing list that encompasses the entire world of Dermatologists and ancillary staff. One suggestion we have received repeatedly is for the e-mag to be briefer than the customary 40 pages, so it is an easy lunchbreak read for you busy professionals.

Accordingly, we shall from the next edition, #23, starting in 2026, reduce the size to approximately 10 to 12 pages and will modify the format to be focussed on a particular theme or topic derived from the professional journals "DERMATITIS" of the ACDS and "CONTACT DERMATITIS" of the ESCD.

Glucose sensors and Insulin Pumps

Based on article: Allergic Contact Dermatitis caused by Glucose Sensors and Insulin Pumps: A full Review, Part 1 + Part 2
by Anton de Groot, et al.,
Part 1 in CONTACT DERMATITIS, Volume 92, Issue 2, February 2025, pp 87-112
Part 2 in CONTACT DERMATITIS, Volume 92, Issue 3, March 2025, pp 120-130

During the past 8 years, a large number of reports have appeared in medical media including both ACDS's DERMATITIS and ESCD's CONTACT DERMATITIS on allergic contact dermatitis to glucose sensors and insulin pumps in paediatric and adult patients with type 1 diabetes mellitus.
The very first issue of The Patch Tester e-mag in December 2019 featured the Hapten of the Quarter of Isobornyl acrylate, in the editorial article "Looking for IBOA".

Isobornyl acrylate in one particular sensor was documented in published articles to have sensitised many hundreds of individuals, and subsequently various other allergenic chemicals associated with the sensors and pumps were discovered, primarily in the adhesives that are used to attach the devices to the skin, but also as residual chemicals that were used in the manufacture of other components of the devices.

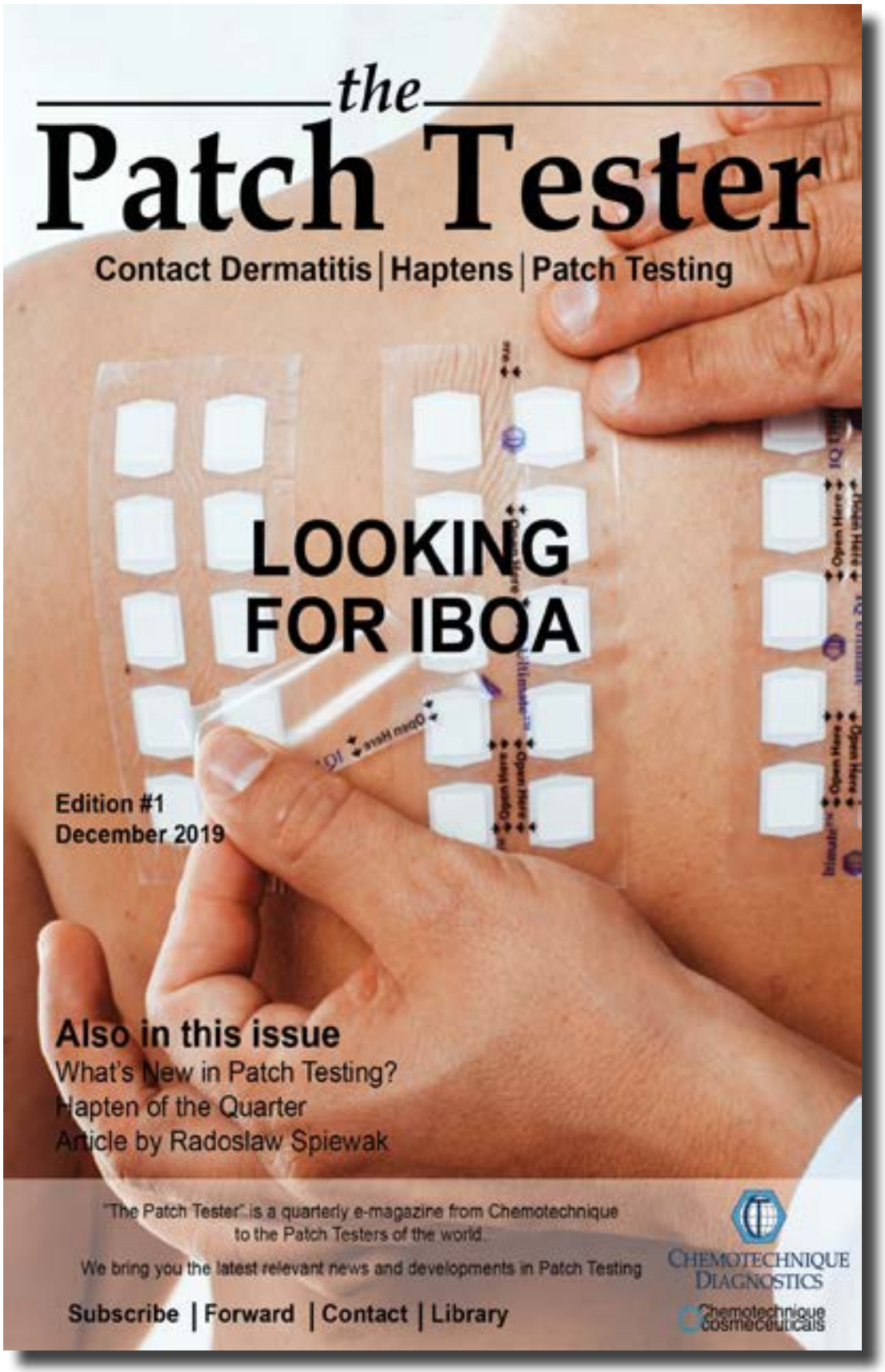
The diagnosis and identification of the problem substances in the devices proved to be difficult due to the unwillingness of the device manufacturers to provide relevant information and product samples to Dermatologists.

These two articles in CONTACT DERMATITIS journal over two published editions in February and March 2025 provides a full and detailed review of all aspects of the subject of ACD to glucose sensors and insulin pumps.

Part 1 comprises 22 pages of information and 147 references with the following sections:
- A general introduction to sensors and pumps
- Cutaneous adverse reactions that they have caused
- The allergenic substances in the devices
- An overview of the glucose sensors and insulin pumps that have caused ACD.

Part 2 comprises 10 pages of information and 90 references, with the following sections:
- All of the published case reports and case series
- The clinical features of ACD to sensors and pumps
- The patch test procedures
- Differentiation from Irritant Dermatitis
- The management of the allergic patients
- Proposed legislation.

These two articles together are a monumental review of a very serious health problem that has appeared and evolved over the past several years. The topic is itself so great that it deserves far more than a quick review in this issue of The Patch Tester. Therefore, it has been selected to be the core theme in the new format of the very next issue of The Patch Tester, #23, due out in early 2026.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CHEMOTECHNIQUE DIAGNOSTICS
Chemotechnique cosmeceuticals

Toluene-2,5-Diamine Sulfate

Based on article “Toluene-2,5-Diamine Sulfate: Allergen of the Year 2025”
by **Amber Reck Atwater & Nina Botto**
in DERMATITIS, Vol 36, Issue 1, Jan/Feb 2025, pp 3-11

Toluene-2,5-diamine sulfate (PTDS) has several synonyms, as it is also known as.....

- Toluene diamine sulfate
- 2,5-diaminotoluene sulfate
- 2,5- diaminotoluene sulfate
- p-toluenediamine sulfate
- Toluene-2, 5-diamine hemisulfate
- 2,5-toluenediamine sulfate
- Para-toluenediamine sulfate.

It is a chemical compound extensively used in permanent hair dye formulations. PTDS belongs to the aromatic amine family, characterized by an aromatic ring (benzene) substituted with amine (-NH2) groups at the 2 and 5 positions. It is created by combining 2,5-diaminotoluene (PTD, para-toluenediamine) with one molar equivalent of sulfuric acid.

It is important to note that the precursor 2,5-diaminotoluene (PTD, para-toluenediamine) is also present alongside the converted toluene 2,5-toluene diamine sulfate (PTDS), with both being potential sensitisers.

Note also that the precursor 2,5-diaminoteoluene is also known as Toluene-2,5 Diamine, which is the name it is known by in the Chemotechnique hapten portfolio, abbreviated to PTD.
Although PTDS is the named “Hapten of the Year” by ACDS, much of the information on PTDS can be extrapolated to PTD, and vice versa, due to their chemical similarities and their frequent mixture in hair-dye preparations.

These substances are used as an alternative to paraphenylenediamine (PPD) in hair dyes.
PTDS and PTD are used to create dye shades from black to blond to grey, with higher concentrations causing darker colours.

These substances are also found in bleach-toner formulations, as well as a component in developing solutions for colour photography and in the dyeing of textiles and furs. Hair dyes are however the primary source of exposure, to both the general public as well as occupational exposure to hairdressers and related professionals.

Authors Note:

PTDS is present in the following Chemotechnique screening series and national/international se-

ries:

H	Hairdressing Series	H-1000
ABS	Australian Baseline Series	ABS-1000
NA	North American Series	NA-1000
NAC	North American Comp. 80 Series	NAC-80
ICB	International Comprehensive Series	ICB-1000
PST	Polish Standard 1 Series	PST-1000
ABS	Australian Baseline Series	ABS-1000

The 1% concentration is considered to be effective in eliciting a positive reaction in sensitised persons, but without causing unnecessary risk or irritation amongst non-sensitised persons.

The American Contact Dermatitis Society named PTDS the “Allergen of the Year 2025”, aiming to raise awareness of its dual role as both an allergen (hapten) and as an alternative for some PPD-allergic individuals.

PTDS and PTD are usually not included in standard patch test screening series, including the current ACDS-90 Series. This exclusion from most testing series quite possibly causes clinical under-diagnosis.

It is this likely under-diagnosis, as well as the need to identify alternative hair dye chemicals for use by PPD-sensitised persons, that has led ACDS to name PTDS as “Allergen of the Year”. The intention is to greatly expand surveillance of the hapten, possibly by its inclusion in revisions of standard testing series or individual testing in suitable clinical cases, and thereby to ultimately gain much new information on its prevalence, cross-reactivity, concomitant sensitisation, clinical signs & symptoms, and clinical consequences. This will help ensure the development of effective prevention and management strategies.

In this original article, the authors concluded that they advocated that the inclusion of PTDS be considered for the next update of the ACDS core screening series. Their reasons were based on the

standard recommendation that allergens with >0.3% to 1% prevalence in concomitantly patch-tested populations should be considered for standard screening series, and PTDS exceeds these criteria based on the 2019–2020 and 2021–2022 NACDG data, with a positive reaction frequency of 1.6% and 1.7%, respectively. Other criteria to incorporate an allergen onto a standard screening series can be based upon a high degree of clinical relevance, common usage of the chemical in products, as well as high patch test prevalence rates.

PTDS qualifies on all these counts.
There are numerous other points of interest to be found scattered throughout this excellent original article; as follows:

- The NACDG showed positivity in 1.6% of 4,109 (2019-2020) and 1.7% of 3,032 (2021-2022) of routinely patch-tested patients.

- In a study based on primarily the European Baseline Extended Series (where it is not included), 1.4% of 7,124 tested patients were positive to PTDS in 1994-2013.

- Studies have shown that positivity rates are much higher in tested populations with an occupational connection to PTDS exposure, such as hairdressers. For example, In a study based on the Australian Baseline Series (which does include both PTDS and PTD), PTDS positivity was 12.9% of 85 patients in 2007-2017. Similarly, a study in Spain found 15.3% of 300 patients and a study in Italy found 7.9% of 140 patients.

- Clinical relevance is typically high for patients with PTDS patch test positivity, particularly for occupationally involved hairdressers. For example, NACDG testing of 52 hairdressers showed 71.2% with current (definite/probable/possible) relevance and a further 25% had past relevance. A clinical relevance figure of 65% is accepted for the North American population.

- PTDS allergic contact dermatitis (ACD) likely presents in a similar fashion to paraphenylenediamine (PPD) ACD, with eczematous dermatitis wherever there is dye contact such as the hands, hairline, periorbital area, neck, and possibly also eyebrows. Interestingly, with PPD-related ACD the scalp can be spared, likely due to sebum on the scalp and the hair itself. PPD reactions are almost always pruritic, eczematous, and can often be vesicular or even bullous in severe cases. Air-borne, photo-exposed, and erythema multiforme-type patterns have been reported with PPD, particularly in occupational cases, as have severe and systemic reactions, which have been known to rarely occur, including asthma, angioedema, and even anaphylaxis. Lesions in these locations are also to be expected with PTDS, given that the exposure sources for both PTDS and PPD are hair dyes.

- Cases have been reported of patch test positivity for PTD and PPD even when neither substance was present in the dyes causing the clinical reactions. It is possible that the positive PTD reaction was due to cross-reactivity to PTDS, and that therefore the PTD was a marker for PTDS sensitivity.

- For hairdressers sensitised to any of these hair dyes then personal protective equipment (PPE) is essential. The best choice with regard to both protection and dexterity is probably nitrile gloves, but protection is still not 100% because dye penetration still occurs after a period of time,

particularly when heat, friction and sweat may be involved.

- A strongly positive patch test reaction to PPD is associated with a greater likelihood of positivity to other dyes.

- Cross reactivity between PTDS, PTD, PPD and other compounds can occur due to clinical co-sensitisation or due to chemical cross-reactivity. Patients sensitised to PTDS and/or PTD are unlikely to be able to tolerate PPD. This was shown in a multinational study which found that 80.7% of 83 patients allergic to PTD were also allergic to PPD. Other studies report a similar or even stronger correlation.

- Conversely, PPD-allergic patients may, in some scenarios, be able to tolerate PTDS and/or PTD as an alternative, with figures of 30% to 50% being reported in different studies.

- 2-Methoxymethyl-PPD (ME-PPD), which is created by adding a methoxymethyl side chain to PPD, has been suggested as an alternative in PPD-allergic individuals due to its reported lower sensitizing potential as compared with PTD and PPD. However, other studies have shown that there is still a strong rate of co-sensitisation.

- Studies have shown high rates of cross-reactions with azo or disperse dyes in both PTD- and PPD-allergic patients.

- The rates of cross-reactivity with non-dye-related para compounds, such as benzocaine, were found to be similar in both PTDS-allergic (8.6%) and PPD-allergic (8.0%) patients.

- These findings emphasize the need for careful consideration of the potential for cross-reactivity in diagnosing and managing PTDS and PPD allergy, as well as the potential for related dye and non-dye compounds to elicit allergic responses.

- Patients with suspected hair dye allergy should ideally undergo patch testing with both PPD and PTDS, as it is not otherwise possible to determine which PPD-allergic patients will tolerate PTDS.

- Alternatives to such chemical hair dyes are needed. These may be marketed as “natural,” “organic,” PPD-free, or dye-free, but it must be noted that products labelled “natural” can contain PTDS and/or PPD, so careful ingredient review of all products is required prior to use.

For further details, the reader is encouraged to access the original article in DERMATITIS, Volume 36, Number 1, Jan-Feb 2025, pp 3-11.

Disease-related Internet Use and its Relevance to the Patient-Physician Relationship in Atopic Dermatitis: A Cross-sectional study in Germany

by Fabian Wallnöfer, et al.,
In DERMATITIS, Volume 35, No. 5, Sept/Oct 2024, pp 498-506

The easy availability of an enormous information resource such as the internet includes of course medical information that can be accessed by patients who have taken an interest in their clinical condition. However, the utilisation of this information resource by the patient is not always appreciated by the patient's own healthcare provider, as this study reports that a quarter of patients included in the study felt that discussing online health information with physicians strained their relationship with the physician.

In this Germany based study, 221 participants provided data for analysis, of whom 84.2% were woman, the median age was 36 years and 55.2% were considered to be regular users of the internet for disease related topics.

The study authors made the following points from their analysis of the data:

The median duration of the Atopic Dermatitis was no less than 28 years.

Participants judged their AD condition to be:

o	Severe	= 31.7%
o	Moderate	= 55.2%
o	Mild	= 13.1%.

Regarding therapy satisfaction:

o	Satisfied or Rather Satisfied	= 31.9%
o	Neither Satisfied nor Not Satisfied	= 17.1%
o	Not satisfied or rather not satisfied	= 24.5%
o	Not in Treatment	= 26.4%.

In total, 80.3% of participants considered the internet to be a very important or rather important source of information.

Contact Eczema

Contact Eczema: Symptoms & Treatment

Symptoms

Symptoms

Causes

Use of the internet by the participants to research AD, was:

- Daily = 4.5%
- Weekly = 20.4%
- Monthly = 30.3%
- Less than monthly = 31.2%
- Not at all for their AD = 13.6%.

Remarkably, those that did not use the internet to access information about their AD cited difficulty in assessing the quality of the information.

Search engines and information websites were used primarily when:

- New symptoms developed = 76.0%
- Symptoms worsened = 76.0%
- Therapy not effective = 69.5%

Areas of interest included:

- Therapy options = 80.5%
- Alternative therapies = 62.1%
- The disease in general = 70.1%
- Disease causes = 62.6%.

Facebook and other such social media were most used when new symptoms occurred, primarily to read testimonials from other people affected by AD.

The participants discussed their internet use to obtain information about their AD:

- Always = 14.7%
- Not at all = 32.1%.

The physician's response to the patient discussing their use of the internet to obtain information on their AD was:

- Negative = 27.6%
- Neutral = 61.0%
- Positive = 11.4%.

Most participants (56.0%) reported receiving no advice about disease-related websites.

Most participants (54.3%) agreed or mostly agreed that they would have liked to receive advice about disease-related websites form their physician. However only 8.6% of participants reported receiving advice from their physician regarding disease-related websites.

Although 41.1% of participants stated that online information enabled them to have a more equal discussion with their physician, 22.7% indicated that such a discussion would strain their relationship with their physician.

In total, 61.7% of participants who used the internet to get disease-related information did so because they did not receive enough information from their physician. This association was particularly strong when the treating Physician was a GP as opposed to a Dermatology Specialist.

Conversely, another study has reported that over one quarter of Dermatology Specialists ("AD medical professionals") had complained about the lack of information on patient education in the German AD Guidelines.

The study authors state that the internet may provide an important platform for individuals to inquire about alternative treatments and viewpoints while avoiding possible judgement from their Physician. Although the majority of Physicians surveyed in another German study considered the use of online health information beneficial for improving the understanding of AD, less than 10% of Dermatologists actively addressed patient online behaviour.

Other studies have reported that many dermatology-related websites and social media content lack accuracy, readability and medical standards. Therefore, Physicians should guide patients to suitable online resources tailored to health literacy, and discuss them actively with their patients.

Patch Testing to Peppermint Oil: The NACDG Experience (2009-2020)

by Erin M Warshaw, et al.,
In DERMATITIS, Volume 36, No. 1, Jan/Feb 2025, pp 498-506

Peppermint (Mentha piperita) is a hybrid species of mint, a cross between watermint and spearmint. Although the genus Mentha comprises more than 25 species, the one in most common use is peppermint. It is indigenous to Europe and the Middle East, though the plant is now widely spread and cultivated in many regions of the world. It is occasionally found in the wild with its parent species.

In 2022, world production of peppermint was 51,081 tonnes, led by Morocco with 84% of the total and Argentina with 14%. Peppermint oil has a high concentration of natural pesticides, mainly pulegone (found mainly in M. arvensis var. piperascens (cornmint, field mint, or Japanese mint), and to a lesser extent in Mentha × piperita subsp. notho) and menthone.

It is known to repel some pest insects, including mosquitos, and has uses in organic gardening. It is also widely used to repel rodents.

The chemical composition of the essential oil from peppermint (Mentha × piperita L.) when analysed by GC/FID and GC-MS shows that the main constituents are menthol (40.7%) and menthone (23.4%). Further components were (±)-menthyl acetate, 1,8-cineole, limonene, beta-pinene, and beta-caryophyllene.

The essential oil also contains menthone and carboxyl esters, particularly menthyl acetate.
Dried peppermint typically has 0.3–0.4% of volatile oil containing menthol (7–48%), menthone (20–46%), menthyl acetate (3–10%), menthofuran (1–17%), and 1,8-cineol (3–6%).

Peppermint oil also contains small amounts of many additional compounds, including limonene, pulegone, caryophyllene, and pinene.

Peppermint also contains terpenoids and flavonoids such as eriocitrin, hesperidin, and kaempferol 7-O-rutinoside.

Peppermint oil is under preliminary research for its potential as a short-term treatment for irritable bowel syndrome and has supposed uses in traditional medicine for minor ailments. Peppermint oil and leaves have a cooling effect when used topically for muscle pain, nerve pain, relief from itching, or as a fragrance. High oral doses of peppermint oil (500 mg) can cause mucosal irritation and mimic heartburn.

Peppermint roots bioaccumulate radium, so the plant may be effective for phyto-remediation of radioactively contaminated soil. Fresh or dried peppermint leaves are often used alone in peppermint tea or with other herbs in herbal teas (tisanes, infusions). Peppermint is used for flavouring ice cream, candy, fruit preserves, alcoholic beverages, chewing gum, toothpaste, and some shampoos, soaps, and skin care products. Medicinal uses of peppermint have not been approved as effective or safe by the US Food and Drug Administration. With caution that the concentration of the pepper-

mint constituent pulegone should not exceed 1% (140 mg), peppermint preparations are considered safe by the European Medicines Agency when used in topical formulations for adult subjects. Diluted peppermint essential oil is safe for oral intake when only a few drops are used.

Although peppermint is commonly available as a herbal supplement, no established, consistent manufacturing standards exist for it, and some peppermint products may be contaminated with toxic metals or other substituted compounds.

Skin rashes, irritation, or allergic reactions may result from applying peppermint oil to the skin, and its use on the face or chest of young children may cause side effects if the oil menthol is inhaled. A common side effect from oral intake of peppermint oil or capsules is heartburn. Oral use of peppermint products may have adverse effects when used with iron supplements, cyclosporine, medicines for heart conditions or high blood pressure, or medicines to decrease stomach acid.

Menthol activates cold-sensitive TRPM8 receptors in the skin and mucosal tissues and is the primary source of the cooling sensation that follows the topical application of peppermint oil.

However, sensitisation to peppermint oil is a known clinical problem. The authors of this study retrospectively analysed the NACDG data from 2009 to 2020 to ascertain the incidence of patch test positivity against Mentha piperita oil 2% in petrolatum.

- The study encompassed 28128 individuals of whom 0.6% (161) showed a positive patch test reaction. Most of these positively reacting patients were females (77.0%) and over 40 years of age (71.4%).
- The most common anatomical sites of dermatitis included face (31.7%, especially lips), hands 17.4%, and generalised (18.6%).
- Nearly one third of reactions (30.4%) were classified as strong (++) or extreme (+++).
- 80.1% of reactions were considered to be clinically relevant.
- Common sources of the peppermint oil were oral hygiene preparations, foods and lip products.
- Co-reactivity with at least 1 of the other 19 fragrance/plant-related patch test screening preparations occurred in 82.6% (133/161), most commonly:
  - Cananga odorata oil (42.9%)
  - Fragrance mix I (41.0%)
  - Hydroperoxides of linalool (35.7%)
  - Compositae mix (35.4%)
  - Jasminum officinale oil (31.9%)
  - Myroxylon pereirae (31.7%)
  - Propolis (28.1%).

In summary, approximately 40% of cases of sensitisation to peppermint or peppermint oil would have been missed if only fragrance screening allergens had been tested.

Patch Test Hapten from Chemotechnique

Art no	Name	Conc.	Veh.
P-036	Peppermint oil	2.0%	pet

Contact Dermatitis secondary to Povidone-iodine: A systematic Review

by Harriet Kennedy
in CONTACT DERMATITIS, Volume 92, Issue 1, January 2025, pp 2-8

Iodine has been in use as a skin antiseptic for over 2,000 years. More recently, clinical utility was limited due to the potential for free iodine to irritate skin and mucosa; both Iodoform (iodine-releasing substances, such as povidone iodine, also Betadine®) and iodine tincture (10% free iodine) are well-known skin irritants, which has limited the clinical application of iodine as a skin antiseptic. Povidone Iodine, also known as polyvinylpyrrolidone-iodine or PVP-iodine) is an iodophore, which is a complex of iodine and iodine-releasing agents, leading to gradual iodine release from the substance, thereby limiting exposure to free iodine. However, despite compounding the iodine to become an iodophor, skin reactions are still widely reported.

In this review, the patch test methodology utilised in the various studies varied widely amongst reports, particularly the vehicle and concentrations used. This of course makes it very difficult to draw reliable overall conclusions from the reported findings of individual studies.

The aim of this study was to review the clinical presentation and results of patch testing in patients with PVP-iodine contact dermatitis, through a systematic review by searching PubMed, MEDLINE, and Google Scholar databases for reports of contact dermatitis secondary to PVP-iodine application. The search comprised 187 reports, with 30 eligible case reports/case series and 8 retrospective cohort studies.

In total, 223 patients were reported with PVP-iodine induced contact dermatitis.

There are numerous points that can be gleaned from the review article, which are listed below:

- The incidence of true iodine contact allergy is unknown and is likely over-estimated due to inherent difficulties in patch-testing iodine, but may be under-reported due to the fact that many reactions reported as allergic are in fact irritant, as certain studies reported that the incidence of irritant reactions was greater than true allergic reactions. However, it is difficult to be absolutely certain due to the lack of any single reference method. For example, many cases of iodine “allergy” are not supported by positive patch test reactions. But that patch test procedure itself varies widely in both vehicle and concentration.
- The most commonly reported reaction was irritant contact dermatitis (51%), followed by allergic contact dermatitis (40%) and contact dermatitis not further specified (9%).
- Amongst the studies covered by the review, the patch testing was most often performed with a 10% PVP-iodine aqueous solution, even though irritant reactions in controls occur.
- Due to the reports of irritant reactions when testing an aqueous solution of iodine (in any concentration), it has been suggested that patch test specificity could be increased by testing with powdered/dried 10% PVP-iodine. Another proposed option is Open Application Testing. This involves applying solution to the test site and allowing it to dry. The test site can be left as is (open)

or covered with tape (semi-open). When tested using an open application method, PVP-iodine 10% solution appears to have a low irritant potential. ’

- A different study of ninety-five patients with suspected disinfectant allergy were tested to PVP-iodine 2%, 5%, and 10% aq. and iodine 0.5% pet. The investigators found 2% aq. PVP-iodine yielded the lowest number of doubtful positive reactions while still detecting the single patient considered to have true iodine allergy (based on clinical correlation and positive ROAT to PVP-iodine 10% ointment).
- In the literature review, 71 patients were simultaneously studied with patch test and ROAT/open test. Only 36 patients were positive to both tests. Given the complexities and inconsistencies of conventional closed-chamber testing with iodine, this was reported to be an attractive and practically simple method. The investigated stated that further comparative studies are required to confirm the sensitivity and specificity of open and semi-open application testing of PVP- iodine in diagnosing iodine contact sensitisation.
- Various testing methods including iodine in petrolatum, ethanol, dried powder, and open application testing were described. Most reactions to PVP-iodine are irritant and patch testing using a closed-chamber method yields inconsistent results due to risk of irritation from free iodine release over the 2-day occlusion time.
- Other components of Betadine®, namely polyoxyethylene nonylphenyl ether and glycerin, have been shown in one study to be non-sensitising, leaving only the iodophore PVP-iodine as a culprit causing any irritant or true allergic reaction.
- Due to gradual release of iodine from solution over time, standard patch test protocols (2 days under occlusion) are problematic and therefore Betadine® solution ‘as is’ should not be used for patch testing in this way.
- Symptoms of iodine sensitivity often manifest with severe vesiculobullous or erosive morphology. Reactions may more usually be irritant or may be truly allergic in nature.
- Irritant reactions are characterised by burn-like morphology. Remarkably, when due to use as a surgical skin disinfectant, the irritant reactions were often distant from the surgical incision site.
- Patch testing for iodine using a closed-chamber method yields inconsistent results despite numerous attempts to optimise concentration and vehicle parameters.
- Contact reactions to iodine most often occur after exposure to surgical disinfectants and are often characterised by burn-like morphology. Surgeons should be aware of the risk of prolonged skin contact with wet iodine solution and take action to ensure solution dries and prevent skin disinfectants dripping and pooling against the skin during surgical procedures.
- Free iodine is responsible for irritant reactions and is increasingly released when PVP-iodine is in a liquid state under occlusion. Therefore, open application testing of PVP-iodine may be the most appropriate testing method.
- Whichever diagnostic test method is used, correlation with the individual patient’s clinical parameters and use-testing is essential, together with patient counselling regarding the limitations of patch testing in diagnosing sensitization to iodine.
- Use of an expired PVP-iodine solution has been reported to cause severe chemical burns, presumed due to higher concentrations of free iodine in the solution.
- Surgeons should be aware of the risk of prolonged skin contact with wet iodine solution.

In summary, there is a lack of conclusive agreement amongst experts regarding the optimum vehicle, concentration, and patch-test methodology.

Incidence of Allergic Contact Dermatitis in Finland 1998 – 2021: A Nationwide registry-based study

by Ville Wikström, et al.,
in CONTACT DERMATITIS, Volume 92, Issue 2, February 2025, pp 113-119

Allergic Contact Dermatitis has primarily been studied at the allergen level, while relatively little research has examined the epidemiological trends of ACD at the national level.

This longitudinal study was based on a meta-analysis with a retrospective review of data from the Finnish Care Register for Health Care that encompasses the entire population of Finland (so no potential bias due to socio-economic factors) during a 23-year period until 2021. However, the data does not include diagnoses made in the private sector, though as only a few private clinics offer patch testing in Finland, this will have little or no effect on the overall results and conclusions.

The diagnoses recorded in the CRHC are hospital-based and made by Dermatologists or dermatology residents, and therefore relatively reliable, and the diagnosis of ACD was based on the patch tests according to the accepted guidelines.

Study limitations included the fact that the researchers had no access to the patch test data that would have confirmed the exact allergen resulting in each case of ACD, and there is no national registry data regarding allergens, although individual Finnish hospitals may keep their own statistics concerning specific allergens.

The total number of study subjects, between the ages of 18 and 65 years, was 26,701, of whom 74.3% were female.

Diagnoses were subdivided as to the type, though not the individual chemical identity, of the potential problem substances, as follows:

- Metals
- Adhesives
- Cosmetics
- Drugs in skin contact
- Dyes
- Other chemicals, including cements, plastics, rubber
- Food
- Plants (non-food)
- Other agents
- Unspecified.

The research paper highlights the following points from their analysis of the data:

- In general, the overall incidence of ACD rose up from 1998 up until 2016, after which it has begun to fall, though there are variations in the trend with regard to specific allergens and sex differences.
- The trend in the overall incidence of ACD was mirrored with several of the different groups of substances, notably Cosmetics, Other chemical products, Other agents, Dyes, Drugs in skin contact, and Adhesives.
- The increasing incidence of ACD between the years 2002 and 2016 reported in this study could have been driven by many different factors, such as an increase in numbers of patients seeking consultation and care, improvements in patient and health care professional awareness, and increases in sensitivity to certain allergens, such as MI/MCI and acrylates.
- However, the overall incidence of ACD began to decline after 2016, with no clear explanation. The study authors believe that their findings reflect the fact that different allergens dominate as a cause of contact allergy at different times, and that patterns of increase and decline in incidence is more affected by the adoption of new legislation that regulates the use of these chemicals that cause ACD. Some examples are shown below.
- Cases of ACD caused by isothiazolinone, a chemical widely used as a preservative in the manufacture of cosmetics, peaked in Europe during 2013-4. Due to stringent government regulation of isothiazolinone, the prevalence of this allergy has decreased since 2016 in many European countries. In contrast, the incidence has continued to rise in North America where no such regulations have been enacted.
- Similarly, the European Union banned in 2005 the use of the preservative methyldibromoglutaronitrile in ‘leave-on’ cosmetics and in ‘rinse-off’ products in 2007. This has also likely contributed to the apparent reduction in the incidence of ACD to cosmetics. However, since the regulation of isothiazolinones, other preservatives, such as benzisothiazolinone (BIT) and ethylhexylglycerin have been used as substitutes by manufacturers, so this may in turn cause an increase in the incidence of ACD to cosmetics containing these alternative chemicals. Time, and patch testing, will tell.
- The identified ACD allergen groups were distributed as follows:
-

	All patients	Men	Women
Metals	35%	26.7%	37.6%
Cosmetics	29.8%	20.0%	32.8%
Other chem products	24.7%	30.5%	22.9%
Other agents	19.4%	22.5%	18.5%
Adhesives	10.8%	15.3%	9.4%
Drugs (on skin)	5.9%	6.1%	5.8%
Dyes	2.4%	1.5%	2.7%
Plants	1.9%	2.1%	1.9%
Food (on skin)	1.8%	2.3%	1.7%
Unspecified	0.6%	0.7%	0.5%

- While 74.7% of patients had only one registered diagnosis during the study period, the remainder had two or more different diagnoses (to different groups of substances). The presence of such multiple recorded diagnoses was also significantly more prevalent in females than in males.

- The results of the study show a clear peak of ACD due to adhesives (acrylates) during the years 2016 and 2019. Previously, the most common scenarios for exposure to adhesives were related to manufacturing, such as printing, coating, painting and dentistry. However, exposure to acrylates can also occur in recreational/leisure time. Another study has previously reported a shift away from occupational to recreational exposure to acrylates/adhesives. This apparent reduction in occupational exposure may have been due to improved workplace practices, including increasing awareness and enhanced legislation. The peak in ACD for adhesives/acrylates was followed by a sharp decline in recent years. This may have been due to more information about the potential dangers of nail and eyelash products that has been spread amongst the professionals encountering such products, and the protective measures against acrylates have improved, which may also contribute to the decrease, especially in females.
- Nickel is still the single most important metal in the single most important allergen group, despite the increased legislation since 2001 in Europe.
- The study results show a clear female predominance in certain allergen groups, and a clear male preponderance for certain other allergen groups. Most allergen groups affected a significantly greater proportion of female than male patients. However, there were a few notable exceptions: ACD caused by Adhesives affected 15.3% of males and 9.4% of females, and ACD caused by Other chemical products and by Other agents were also significantly more frequent in males than in females.
- For females, their predominance in certain occupations such as hairdressing (ACD for dyes, rubber, preservatives) and nursing (ACD for rubber and preservatives). Usage of cosmetics and jewellery is also usually more common among females. Females are more often exposed to many household chemicals than males. Notably, females are more likely than males to seek medical help, which may explain the higher overall incidence of ACD in females.
- However, on the other hand, significantly higher proportions of male than female patients had ACD to Adhesives, Other chemical products and Other agents. This may be explained by the male predominance in occupational sectors such as construction, construction material industry manufacture and supply, concrete casting and wood working, all of which commonly involve exposure to sensitising agents such as adhesives, cement, colophonium, epoxy, plastic and rubber. Similarly, the male preponderance in the Other agents allergen group may reflect the use of coolers and cutting oils in male-dominated industries.
- The number of cases of ACD for Drugs in contact with skin increased during the study period. This may have been due to the easy availability of topical medications such as neomycin and bacitracin that are widely advertised to consumers in Finland.

The study authors conclude by suggesting that similar studies be performed in other countries to corroborate this data based on the population of Finland.

Patch Test Results to the Spanish Baseline Test Series according to Age groups: A multicentric prospective study from 2019 to 2023

by David Pesque, et al.,
in CONTACT DERMATITIS, Volume 92, Issue 2, February 2025, pp 120-130

Contact dermatitis arises from the skin sensitisation to external substances, known correctly as haptens. Sensitisation is influenced by a myriad of factors, including genetics, skin barrier, gender, occupation and socio-demographic habits, and to a limited extent also by age. Age affects several of these other factors, which raises the question as to whether skin sensitisation differs between age strata.

This study, based on 13,368 patients attending the many clinics of the Spanish REIDAC organisation (Spanish Contact Dermatitis Register, encompassing all Spanish state hospitals), were patch tested using the 31-hapten Spanish Baseline Series during the period January 2019 to December 2023, so 5 complete years. Out of a total of 6,069 patients, 45.4% presented with at least one positive patch test reaction.

Patch test hapten products used were from Chemotechnique as well as the SmartPractice AllergEAZE® and TRUE Test® products.

In order to investigate any age-relevant differences in patch test results, the patients were categorised as follows:

0-11 years	12-18 years	19-30 years	31-65 years	>65 years
Children	Adolescents	Young Adults	Middle aged Adults	Older Adults.

Occurrence of sensitisation, relevance, clinical features and hapten identities were investigated with multivariate logistic regression.

Current relevance was diagnosed if sensitisation, as defined by a relevant positive patch test result, could explain or contribute to the dermatitis.

Polysensitisation was defined as positivity to three of more haptens of the Spanish Baseline Series. Although there were numerous verbal remarks about the incidence of the different haptens amongst the different age groups, the information can best be shown as a couple of tables that illustrate the incidence of positivity for each of the 31 haptens, including their relative rankings

Hapten	0-11 yrs	12- 18 yrs	19-30 yrs	31-65 yrs	>65 yrs
Nickel sulphate	**8.3%**	**6.4%**	**19.5%**	**26.6%**	**18.4%**
Lanolin	0.4%	0.2%	0.5%	0.6%	0.8%
Neomycin sulph.	2.2%	0%	0.3%	0.8%	1.1%
Potassium dichr.	3.4%	1.7%	1.0%	3.5%	3.5%
Caine Mix	0.6%	0%	0.2%	0.9%	2.2%
FM I	3.1%	2.5%	2.7%	4.3%	4.5%
Colophonium	2.2%	3.3%	1.5%	1.3%	1.0%
Paraben Mix	1.3%	0.6%	0.3%	0.3%	0.7%
Myroxylon resin	2.2%	1.2%	2.0%	3.3%	4.5%
Cobalt chloride	4.7%	4.1%	4.4%	5.0%	4.6%
PTBP	1.3%	0.4%	1.4%	1.5%	1.5%
Epoxy resin	0.4%	0.4%	0.6%	1.1%	0.8%
Carba Mix	1.3%	0.6%	1.3%	1.9%	1.5%
IPPD	1.7%	1.0%	0.5%	0.7%	0.9%
MCI/MI	3.1%	3.7%	3.5%	4.8%	3.6%
Quaternium 15	1.3%	0.8%	0.7%	0.7%	1.0%
PPD	3.0%	2.3%	2.7%	4.0%	3.0%
Formaldehyde	2.4%	3.5%	2.6%	2.3%	2.4%
Mercapto Mix	0.0%	0.2%	0.3%	0.4%	0.2%
Thiuram Mix	0.4%	0.6%	0.9%	1.9%	1.1%
Diazolidinyl urea	0.9%	1.0%	0.3%	0.3%	0.9%
Tixocortol pival.	0.4%	0.2%	0.2%	0.2%	0.5%
Imidazolidinyl urea	0.4%	0.8%	0.5%	0.4%	0.5%
Budesonide	1.3%	0.4%	0.3%	0.7%	1.1%
MBT	0.0%	0.2%	0.4%	0.4%	0.2%
MI	**6.6%**	**7.7%**	**5.6%**	**7.1%**	**5.9%**
FM II	2.8%	3.2%	1.7%	3.3%	4.0%
2-Hema	1.8%	1.5%	7.3%	4.8%	1.4%
Textile Dye Mix	2.4%	2.6%	2.6%	3.3%	3.1%
Linalool HPO	**10.9%**	5.2%	4.9%	4.9%	5.2%
Limonene HPO	**9.7%**	4.7%	5.7%	3.8%	3.4%

Haptens and figures of particular interest are shown in red text.

Analysis of the data from the 31 haptens composing the Spanish Baseline Series delineated by age group revealed trend differences in sensitisation for 7 haptens; namely nickel, potassium dichromate, caine mix, colophony, Myroxylon pereirae resin, 2-hydroxyethyl methacrylate (2-HEMA) and limonene hydroperoxide. Among these 7 age-affected haptens, nickel, caine mix, Myroxylon pereirae resin and 2-HEMA frequency of sensitisation was higher in adult age groups, whereas in contrast limonene hydroperoxide and colophony were very frequent in the lower two age groups.

In regard to potassium dichromate, both paediatric and ≥66-year-old adults had a higher burden of positivity compared to middle-aged individuals.

Clinical relevance, including both current and past relevance, differences were found for eight of the thirty-one haptens, including nickel, potassium dichromate, caine mix, colophony, Myroxylon pereirae resin, diazolidinyl urea, 2-HEMA and linalool hydroperoxide. This ties in closely with the 7

haptens which showed age-related differences in positivity.
The addition of SPIN factor into the analysis also reveals some interesting points. The SPIN Factor is a useful way of illustrating the clinical significance of a hapten relative to other haptens, as it is a function of both prevalence and clinical relevance as well as likely severity of clinical symptoms. Considering the SPIN adapted values, the most clinically important haptens, were nickel sulphate, linalool hydroperoxide and methylisothiazolinone. However, their SPIN-adapted value varied considerably depending on age group, with nickel reaching its highest values in adults (of any group) and linalool hydroperoxide in 0-11 years age group (children.) Limonene hydroperoxide was also among the most clinically relevant in children, adolescents and young adults. Other haptens presenting with high SPIN adapted value in different age groups include MCI, MCI/MI, 2-HEMA and both Fragrance mixes I and II.

The relative incidence of positivity of each hapten compared to the other haptens (of the Spanish Baseline Series) i.e. ranking, is also best seen in table format, and reveals some interesting phenomena.

Hapten	0-11 yrs	12- 18 yrs	19-30 yrs	31-65 yrs	>65 yrs
Linalool	**1**	**3**	**5**	**5**	**3**
Limonene	**2**	**4**	**4**	**9**	**9**
MI	**3**	**1**	**3**	**2**	**2**
Nickel sulphate	**4**	**2**	**1**	**1**	**1**
FM II	5	8	11	10	5
Cobalt chloride	6	6	7	8	8
PPD	7	10	8	7	11
MCI/MI	**8**	**5**	**6**	**4**	**6**
FM I	9	11	9	6	4
Potassium	10	12	17	11	10
Formaldehyde	11	9	10	15	13
Neomycin sulph.	12	32	30	21	21
Colophonium	13	7	14	17	19
Myroxylon p resin	14	15	13	12	7
2-HEMA	15	14	2	3	15
Carba Mix	16	20	15	16	16
Budesonide	17	24	26	24	20
Quaternium 15	18	21	19	20	24
Diazolidinyl urea	19	16	29	30	23
Paraben Mix	20	18	28	29	26
PTBP	21	28	18	18	18
IPPD	22	22	23	23	25
Thiuram mix	23	19	16	14	17
Imidazolidinyl u.	24	17	22	28	29
Tixocortol piva.	25	27	27	31	28
Lanolin	26	29	20	25	22
Caine Mix	27	30	31	22	14
Epoxy resin	28	23	21	19	27
Textile Dye Mix	29	13	12	13	12
MBT	30	25	25	27	30
Mercapto Mix	31	26	24	26	31

Haptens and figures of particular interest are shown in red text.

These results illustrate the progressive increase in prevalence of skin sensitisation with age, with a plateau reached in middle-aged adulthood and a subsequent reduction in older adults. Possible explanations for the increase from adolescence to adulthood could be an increased cumulative lifetime exposure of individual haptens, as well as different exposure patterns between the age groups. It is an acknowledged phenomenon that skin sensitisation can and does appear in adults to a hapten to which the patient has been exposed intermittently thorough life but previously without any reaction.

The occurrence of this decline in skin sensitisation with advancing age may be explained by immuno-senescence causing reduced efficiency of the immune function, which in turn may lead to not only a reduction in sensitisation but also correspondingly reduced patch test degree of positivity. However, the results of this study show a still high frequency of patch test positivity amongst the older adults (> 65 years of age), indicating that this group is despite the plausible alterations of T-cell-mediated immunity is indeed still susceptible to skin sensitisation. This feature may be explained by barrier impairment with age or the loss of “low-zone tolerance” phenomenon, by which there is an age-related reduction of Treg-cell responses. This hypothesis is also supported by previous studies indicating that contact dermatitis in the elderly may be associated with more fragrance and preservative allergy than other age groups, as well as to polysensitisation.

In terms of polysensitisation, which is considered a marker of susceptibility for skin sensitisation as well as of high allergen exposure, children, middle-aged adults and older adults presented the highest PS prevalence, possibly suggesting factors or habits associated with an increased exposure to certain haptens in these groups.

A limitation of this study is the fact that children (0-11 years) and adolescents (12-18 years) accounted for a small fraction of the cohort (e.g., 1.7% and 3.6%, respectively) of 6,069 patients in the study. This may be a true reflection of the lower susceptibility to sensitisation to the 31 haptens of the Spanish Baseline series, or it may be a function of a low referral rate to contact allergy units by Paediatricians and general Dermatologists.

Regarding the potential role of atopic dermatitis and its influence on the risk of the development of contact allergy, several previous studies have shown disparate results and discordant conclusions. This particular study reinforces those previous reports that do not suggest that atopic dermatitis (Type I, IgE-mediated allergy) is a risk factor for skin sensitisation to contact allergens (Type IV, cell-mediated allergy).

This study highlights the importance of fragrance-related haptens, particularly linalool and limonene hydroperoxides. In relation to children and adolescent-specific haptens, these two haptens are of outstanding importance. In this study cohort, sensitisation to these two haptens was significantly more common in the paediatric and adolescent groups, highlighting an early pattern of exposure to these haptens, with its peak among children and then a descending trend. Moreover, linalool hydroperoxide was more common in children and adolescents, and its clinical relevance was higher in comparison to adults. Both hydroperoxides in paediatric allergic contact dermatitis have proved to be frequent and relevant haptens in paediatric patch test series.

The results from this study reinforce the significance of sensitisation to limonene hydroperoxide in

the paediatric group. Generally, fragrances are important haptens in the paediatric population due to their presence in a wide spectrum of products, including personal care products, cosmetics, essential oils and diffusers, among others. Despite Fragrance mix I and Fragrance mix II having been recommended as patch-testing allergens for paediatric patients, these results also encourage the additional testing for limonene (and to a lesser extent also linalool) as important haptens for this group of patients.

Other haptens of especial significance are the usual culprits of nickel sulphate, MI, MCI/MI, Myroxylon pereirae resin, colophonium, and also the relative newcomer 2-HEMA.

The study authors conclude their paper by stating that no age-related differences in skin sensitisation tendency and relevance were detected for most haptens (24/31 of the Spanish Baseline Series), reinforcing the importance of utilising a baseline series in any patient with suspected contact dermatitis, regardless of age. However, some haptens showed an age-related pattern of sensitisation either in adults (nickel sulphate, 2-HEMA, Myroxylon pereirae resin and caine mixes) or children/adolescents (colophonium, limonene hydroperoxide).

This is a very complex study and with many more points of interest than are shown in this brief review article. Therefore, the viewer is encouraged to read the original article published in CONTACT DERMATITIS in order to gain greatest benefit from the study results.

Comparison of patch testing Brazilian (Green) Propolis and Chinese (poplar-type) Propolis: Clinical epidemiological study using data from the Information Network of Departments of Dermatology (IVDK)

by K Piontek, at al.,
in CONTACT DERMATITIS, Volume 92, Issue 3, March 2025, pp 120-130

Following on from an article in the December 2024 edition of The Patch Tester, entitled Results of Patch Testing Propolis in the European Baseline Series: A 4-year retrospective study by Gizem Kocabas, et al. (As published in CONTACT DERMATITIS, Volume 91, Issue 5, November 2024, pp 375-378) this current research study is by the same lead author and is looking at the patch test results utilising propolis from two different species sources.

One of the two Propolis haptens manufactured by SmartPractice in their AllergEAZE product rage is designated “Propolis” and identified with code NA71, and is a 10% petrolatum based hapten. This is based on the Chinese (Poplar-type) Propolis. Another hapten manufactured by SmartPractice in their AllergEAZE product range is designated “Propolis [B]” with code NH400, and is a 10% petrolatum based hapten. This is based on the Brazilian (Green) Propolis. It was reported by the study authors that this particular batch of NH400 contained high levels of anaerobic bacteria, and it had not been purified by ethanolic extraction.

The results from the study showed 23.5% of patients with a positive PT result to NH400 (Brazilian/Green Propolis), with unclear clinical relevance in most cases. These patients were less often sensitised to colophony and fragrances but compared to patients giving a positive PT reaction to NA71 (Chinese/Poplar Propolis) they were more often co-sensitised to nickel sulphate and cobalt chloride. The authors postulate that the pattern of concomitant reactivity with the NH400 hapten may have been due to the bacterial contamination rather than the Propolis constituents in the test product.

Editor’s Note:
The Chemotechnique propolis hapten marker has chinese origin.

Patch Test Hapten from Chemotechnique

Art no	Name	Conc. Veh.	
P-022	Propolis	10.0%	pet


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Long-term observations on the European PhotoPatch Test Baseline series (EPTBS) in Real Clinical Practice: 11 Years of Results in a Spanish Cohort and Suggestions for an EPTBS Update

by Sofia Gomez-Martinez, et al.,
in CONTACT DERMATITIS, Volume 92, Issue 4, April 2025, pp 277-282

Photoallergic contact dermatitis (PACD) represents a delayed-type hypersensitivity reaction to a photo-activated antigen applied to the skin. This happens in those subjects previously sensitised to such a substance or to an antigenically similar substance that invokes immunological cross-reactivity.

The photopatch test (PPT) is the preferred diagnostic tool to confirm PACD and photoallergic reactions. However, PPT lacked full standardisation in Europe up until 2013, which hindered its widespread adoption and use, which in turn limited its clinical application, which in turn limited the number of diagnoses of PACD.

To address this issue, the European Multicentre Photopatch Test Study (EMCPPTS), was convened, and this led to the establishment between 2008 and 2011 of a standardised European Photoallergen Patch Test Series. Published in 2012, the EMCPPTS preliminary series revealed a PACD positivity rate of 19.4%. Initial studies showed that non-steroidal anti-inflammatory drugs (NSAIDs) to be the most common photoallergens, closely followed by organic ultraviolet light solar filters. Subsequently, in 2013 the expert panel proposed a European Photopatch Test Baseline Series (EPTBS), comprising 20 photoallergens, of which 15 were UV organic solar filters, 4 were topical NSAIDS and 1 was a topical antihistamine.

In addition, an extended EPTBS incorporating 15 additional substances was developed, and is currently recommended, depending on the clinical scenario for the individual patient.

However, despite this consensus-based approach, in the past decade there are only a few published reports on the practical application of the EPTBS.

This study was designed by the investigators to describe the photopatch experience with the EPTBS over 11 years at the Dermatology Department of a tertiary hospital in Barcelona Spain. The study is the largest reported photopatch testing investigation in Spain since the standardisation of the EFPBTS in 2013.

Prior to the establishment of the EPTBS, reports of positivity rates from across Europe were inconsistent, with northern European countries figures ranging from 3% to 11%, while Mediterranean

countries reported rates from 20% to 43%. These very large differences have been attributed to a lack of standard methodology and haptens/allergens tested, which made any European consensus difficult, which in turn made it difficult to improve the reproducibility and sensitivity of the PPT to achieve relevant results.

Since the creation of the standardised EPTBS in 2013, only studies performed in Spain and Portugal have been published. These studies utilised both the baseline and the extended EPTBS for each patient, and reported a positivity rate for PACD of between 21.5% and 33.6%. In comparison, this study published here shows a much lower positivity rates (7.4% of patients were diagnosed with PACD in this study), but the extended EPTBS was only applied to 14% of the patients in this study. If there had been a systematic use of both the baseline and the extended EPTBS in this study, this might have elicited a greater number of positive reactions to other haptens/allergens along with cross-reactions, especially those involving NSAIDs.

In this study, all 148 patients were referred for PPT due to a suspicion of PACD. All patients underwent PPT with EPTBS (supplied by Chemotechnique Diagnostics), according to current European recommendations. All cases were assessed to rule out allergic contact dermatitis (ACD) using European Baseline Series (supplied by Chemotechnique Diagnostics) and, when necessary, individual's own substances were also tested. All patients underwent PPT with EPTBS (Chemotechnique Diagnostics), according to current ESCD recommendations. Moreover, the suitability of patch testing an additional UV filter battery (SmartPractice AllergEAZE®) was assessed in all patients and was ultimately applied to 8 patients.

All reactions were graded according to the ICDRG criteria.

The clinical relevance of each positive result was determined according to the COADEX coding system (C: current relevance; O: old or past relevance; A: actively sensitised; D = do not known relevance; EX = exposed).

PACD was defined as a reaction exclusively present in the irradiated set, while ACD was diagnosed if both the irradiated and non-irradiated sets exhibited the same level of positive reaction. Photo-aggravated ACD was diagnosed when both the irradiated and non-irradiated sets showed positive reactions to the same hapten/allergen, with the reaction in the irradiated set being at least one grade stronger than in the non-irradiated set.

A total of 148 PPT using the EPTBS were conducted, and the extended EPTBS was added in 22 cases, as indicated by clinical suspicion. The patients' own products were broadly applied when required, according to each individual patient situation.
The results showed as follows:

- A positive PPT was found in 11/148 patients, so 7.4% of cases, diagnosed as PACD.
- Among the 11 cases with positive PPT were 15 positive reactions to 8 different haptens/allergens.
- 87% of PPT reactions were considered to be currently relevant.
- NSAIDs were most common with 9/15 = 60%. This is in line with most other studies showing the preponderance of NSAIDs in causing PACD.

- Ketoprofen was 6/9 cases of NSAIDs. Ketoprofen is known to show cross-reactivity with benzophenone-3, octocrylene, fenofibrate, dexketoprofen and piketoprofen, though this small-scale study did not find any cross-sensitisations between ketoprofen and other substances other than Fragrance Mix I in two cases. There is a common aldehyde function found in ketoprofen and cinnamal, which is a component of Fragrance Mix I, and that has been postulated to cause cross-sensitisation between these two substances.
- Etofenamate was 3/9 cases of NSAIDs, though this has been reported to be the most important NSAID in a UK study. However, this may reflect different prescription patterns between different countries, which makes drawing Europe-wide conclusions difficult. This substance has a comparatively higher rate of unknown relevance, and it has been postulated that this may be due to photo-toxicity.
- UV filters were 5/15 positive reactions (33%).
- One case of 15 (6.6%) showed positivity to the patient's own test substance, which was not defined.
- Diagnosed as ACD to the EPTBS were 14/148 patients (9.5%), comprising 21 positive reactions to 17 different haptens/allergens including many patients' own test products. Of these, 67% were currently relevant. Most common ACD haptens/allergens were methylene bis-benzotriazolyl tetramethylbutylphenol (Tinosorb M®) and ethylhexylsalicylate.
- There were no positive test results to benzophenone-3 or octocrylene in this study, which are otherwise frequently described as a cause of PACD.
- There were no cases of photo-aggravated ACD or cross-reactions between photoallergens.
- When tested with the European Baseline Series (EBS), there was a positivity rate of 39.9%, comprising 116 positive test results amongst 59 patients.
- Among all the positive allergens of the EBS, the most frequent were MCI/MI (10.3%), Fragrance mix II (9.5%), Fragrance mix I (8.6%) and Myroxylon pereirae resin (8.6%). There were simultaneous positive reactions to ketoprofen and Fragrance mix I in two patients. Conversely, the test set for UV filters did not give any positive test results.

When testing these suspect PACD patients with the haptens/allergens of the European Baseline Series, there was a significant proportion of cases of patch test positivity, often to substances which are commonly found in cosmetics and topical products, and which are often applied in a similar pattern to photo-sensitising substances (e.g., sunscreens, etc).

This consideration, combined with recent evidence suggesting the photosensitising potential of some of the most common contact allergens in the EBS (e.g., Fragrance Mix I and II, Myroxylon pereirae resin, MCI/MI), leads the study authors to hypothesise that certain cases of photo-positivity may actually represent photo-aggravated ACD. However, to support this hypothesis, the allergens in the European Baseline Series would need to be duplicated with half being irradiated during patch testing. This is obviously an additional work burden and complication which will effectively prevent its ad hoc utilisation. Nevertheless, further systematic studies are necessary to evaluate the potential inclusion of fragrances and other substances from the European Baseline Series into the EPTBS set of photoallergens.

Editor's Note:
Chemotechnique offer the following haptens in the photo-patch application:
PhotoPatch Series PP-1000

	Art.No	Name	Conc
1.	H-014C	BENZOPHENONE-3	10.0% pet
2.	H-023C	BENZOPHENONE-4	2.0% pet
3.	M-024B	4-METHYLBENZYLIDENE CAMPHOR	10.0% pet
4.	E-019C	ETHYLHEXYL METHOXYCINNAMATE	10.0% pet
5.	O-009	OCTOCRYLENE	10.0% pet
6.	I-009	ISOAMYL p-METHOXYCINNAMATE	10.0% pet
7.	A-006C	PABA	10.0% pet
8.	B-029C	BUTYL METHOXYDIBENZOYLMETHANE	10.0% pet
9.	B-037	BIS-ETHYLHEXYLPHENOL METHOXYPHENOL TRIAZINE	10.0% pet
10.	D-055	DROMETRIZOLE TRISILOXANE	10.0% pet
11.	K-002B	Ketoprofen	1.0% pet
12.	D-062	2-(4-Diethylamino-2-hydroxybenzoyl)-benzoic acid hexylester	10.0% pet
13.	O-010	ETHYLHEXYL TRIAZONE	10.0% pet
14.	M-037	Methylene bis-benzotriazolyl tetramethylbutylphenol	10.0% pet
15.	E-025	Etofenamate	2.0% pet
16.	D-063	DIETHYLHEXYL BUTAMIDO TRIAZONE	10.0% pet
17.	P-033	Piroxicam	1.0% pet
18.	D-065	DECYL GLUCOSIDE	5.0% pet
19.	H-020B	BENZOPHENONE-10	10.0% pet
20.	P-024B	PHENYLBENZIMIDAZOLE SULFONIC ACID	10.0% pet
21.	H-024B	HOMOSALATE	10.0% pet
22.	O-007B	ETHYLHEXYL SALICYLATE	10.0% pet
23.	P-035	Polysilicone-15	10.0% pet
24.	D-064	Disodium phenyl dibenzimidazole tetrasulfonate	10.0% pet
25.	T-014	TRICLOSAN	2.0% pet
26.	D-061B	Diclofenac sodium salt	5.0% pet
27.	T-026	Thiourea	0.1% pet
28.	H-001	Hexachlorophene	1.0% pet
29.	M-028	METHYL ANTHRANILATE	5.0% pet
30.	T-013	TRICLOCARBAN	1.0% pet

Website Review

ACDS CAMP 2.0

CAMP is a Contact Allergen Management Program, developed by the American Contact Dermatitis Society (ACDS) as a resource for both Dermatologist members of the ACDS as well as their patients, with a patient-focussed and accessible information resource.

Essentially, the patient access section of the new website and corresponding smartphone app lists chemicals and substances along with products that are found in the American market, as well as free-from lists.

As part of this commitment by ACDS of advancing the care and understanding of dermatitis and allergy, they created the Contact Allergen Management Program (CAMP), a web-based resource designed to help patients manage allergic contact dermatitis and find personal care products that are safe for them to use.

CAMP is a web-based resource designed to help patients manage allergic contact dermatitis and find personal care products that are safe for them to use.
CAMP includes the following:

- Free access for ACDS members and their patients
- Ability to offer personalized medicine by generating safe lists based on patch testing results
- Access to patient safe lists on the go through the CAMP mobile apps (available on iPhone and Android devices)
- Access to educational resources to assist in patient counselling
- Ability to scan product information for instant feedback on product safeness.

CAMP 2.4 was released on February 15th 2025 as an update to the mobile app that now allows users to automatically login with biometrics (face ID or fingerprint) or by using stored email/password login credentials.

CAMP is an exclusive tool for ACDS members and their patients.
See https://www.contactderm.org/resources/acds-camp

The biggest limitation of the CAMP database, even for patients, is that in order for the patient to register to gain access the patient requires two codes that are provided to them by their ACDS-registered Dermatologist. Without those codes there is no access even to the patient section of the website and the app.

A limitation of the CAMP database is that although they strive to keep product information up to date, manufacturers may change their ingredient lists causing product information to become outdated. In addition, retailers may carry an older version of the product on their shelves, causing the ingredient list to be different from the information on this list. Therefore, users should always review the ingredients listed for a product prior to use and confirm that it does not contain any of the allergens to which they are sensitised.

This CAMP database is of course based on products available in the USA market.
A very important fact for users not based in USA (though under the management of a Dermatologist registered with the ACDS) is that products in the USA may contain different ingredients compared to the product of the same name and from the same manufacturer in for example Europe. This is because there may be different legislation in the USA from (for example) the EU about the identity of chemicals in a product as well as their permissible concentration. Classic examples are isothiazolinone and MDBGN used as preservatives in some cosmetics.

https://www.contactderm.org/resources/acds-camp/learn-more

Wouldn't it be nice if the ESCD could develop a similar database for EU countries ??
Or even individual Dermatologist societies for e.g., UK or Germany or France, etc, could develop a comparable dataset just for their own country's products.

Note though that in the Chemotechnique website, the various Hapten Information texts available for download list some of the products that may contain a particular hapten / allergen. For example, looking at Propolis, the website page at https://www.chemotechnique.se/products/haptens/propolis/ states....

"Propolis is found in biocosmetics, face creams, ointments, lotions, solutions, varnish, toothpaste, mouthwashes, tablets, chewing gum, etc. Also found in wax for violins. Contains flavonoid aglycones and the main hapten is 1,1-dimethylallyl caffeic acid ester (LB-1)".

Plus the Hapten Information card is a Patient Information Sheet that states

"What is Propolis and where is it found?

What else is Propolis called?

Things you can do to help manage a Contact Allergy".

Website Review

You are invited to notify us If there is a website you would like to have reviewed in a future issue of The Patch Tester or if there is a society or other website that you would like to have included in these lists.

Dermatology Society Websites

ILDS:	*International League of Dermatology Societies*	www.ilds.org
ICDRG:	*International Contact Dermatitis Research Group*	www.icdrg.org
EADV:	*European Academy of Dermatology & Venerology*	www.eadv.org
ESCD:	*European Society of Contact Dermatitis*	www.escd.org
ACDS:	*American Contact Dermatitis Society*	www.contactderm.org
APEODS:	*Asia-Pacific Envmntl & Occupational Dermatology Society*	www.apeods.org
EAACI SAM:	*European Academy of Allergy & Clinical Immunology*	www.eaaci.org
BAD:	*British Association of Dermatology*	www.badannualmeeting.co.uk
AAD:	*American Academy of Dermatology*	www.aad.org
PDA:	*Pacific Dermatolologic Association*	www.pacificderm.org
APD:	*Association of Dermatology Professors*	www.dermatologyprofessors.org
NDA:	*Nordic Dermatology Association*	www.nordicdermatology.com
GDA:	*German Dermatology Society*	www.derma.de
FSA:	*French Society of Dermatology*	www.sfdermato.org
CDA:	*Caribbean Dermatology Association*	www.caribbeanderm.org
ACD:	*Australian College of Dermatologists*	www.dermcoll.edu.au
NZDS:	*New Zealand Dermatology Society*	www.nzdsi.org
DNA:	*Dermatology Nurses Association*	www.dnanurse.org
DermNET NZ:	*Dermatology Infomation Resource for Patients*	www.dermnetnz.org

Dermatology Meeting Websites

www.eadv.org
www.aad.org
www.dermatologymeeting.com
www.asiaderma.sg
www.dubaiderma.com
www.cairoderma.com