the Patch Tester

Contact Dermatitis | Haptens | Patch Testing

Edition #7
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THE FRAGRANCE ISSUE

”The Patch Tester” is a quarterly e-magazine from Chemotechnique to the Patch Testers of the world.

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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 seventh issue comprises over 40 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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CONTACT

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ACKNOWLEDGEMENTS

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Optimising Patch Testing for Fragrance marker: is 1% enough for single fragrance markers and how does the TRUE Test system compare with investigator loaded systems to detect fragrance allergies?

What’s New in Patch Testing is the growing realisation that the state of the art in testing for fragrance sensitivity is still far from perfect!!

The latest issue of Contact Dermatitis (June 2021) contains no less than three publications that focus on Fragrance Allergy.

1. **Skin Exposure to Scented Products used in Daily Life and Fragrance Contact Allergy in the European general Population – The EDEN Fragrance Study**
by Cynthia C A van Amerongen, et al.
in Contact Dermatitis, Volume 84, Issue 6, June 2021, pp 385-394.

2. **Frequency of Sensitization to the individual Fragrances of Fragrance Mix I and II according to the Factors included in the MOAHLFA Index**
by Maria J Sanchez-Pujol, et al.
in Contact Dermatitis, Volume 84, Issue 6, June 2021, pp 395-406.

3. **A Negative Breakdown Test in a Fragrance Mix I positive Patient does not rule out Contact Allergy to its Fragrance Constituents**
by Johannes Geier, et al.
in Contact Dermatitis, Volume 84, Issue 6, June 2021, pp 407-418.

There is also a landmark paper from as far back as 2015 that reported on inefficiencies and inaccuracies in testing for fragrance allergy using various patch test systems.

4. **Patch test results with Fragrance markers of the Baseline Series – analysis of the European Surveillance System on Contact Allergies (ESSCA) Network 2009-2012.**
by Peter Frosch, et al.
in Contact Dermatitis, Volume 73, Issue 3, June 2015, pp 163-171.

The studies highlight the questions if testing with amyl cinnamal, eugenol and geraniol at 1% may lead to false-negative results. The single markers in FM-1 are supplied by Chemotechnique and Smartpractice (AllergEAZE). The concentrations of all FM-I fragrance components other than cinnamal are twice as high in the Chemotechnique series as in the allergEAZE series, with the exception that Cinnamal had the same concentration in both. It is suggested in the article that to overcome the problem with false-negative results and to better identify individuals sensitised to fragrances, test concentrations for several fragrance haptens should be raised to 2%, corresponding to customary practice in Sweden, North America and the UK.

Further the articles raises questions regarding the sensitivity of FM-1 in TRUE Test compared to investigator loaded systems such as Chemotechnique haptens and the AllergEAZE products. The TRUE Test system has been reported to detect fewer cases than FM-1 in investigator-loaded systems. Further, using TRUE Test (which contains FM I and MP but does not contain HICC or FM

II) cannot detect possible sensitisations to HICC, citral, farnesol, citronellol, α-hexyl cinnamal, and coumarin. Being aware of this, physicians who only perform TRUE Test should consider adding the FM II to all patients tested, and the individual haptens in FM II in the aforesaid special populations.

All verbatim quotes are in italic script.

Article #2:
Frequency of Sensitisation to the individual Fragrances of Fragrance Mix I and II according to the Factors included in the MOAHLFA Index

A specific fragrance series was patch tested in 1013 patients.
The most frequent haptens in men, women, children, and retired people were:

- *Evernia prunastri (16%)* *(Men)*
- *Geraniol (16.6%)* *(Women)*
- *Isoeugenol (17.9%)* *(Children)*
- *Geraniol (22.4%)* *(Retired)*

Citral (20.5%) and hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC) (14.5%) were the most common haptens in occupational eczemas and were also associated with a large proportion of hand and facial dermatitis.

During the study period, a total of 19,588 patients underwent patch testing with the Spanish baseline series, and 1,590 (8.1%) reacted positively to at least one fragrance marker (HICC [n = 224]; MP [n = 481]; FM I [n = 924]; or FM II [n = 661]).

In the latter group, only 1013 were patch tested with a specific fragrance series, from Chemotechnique (n = 607) or allergEAZE (n = 406); 682 of 1013 patients tested with the specific fragrance series had at least one positive reaction to an individual fragrance of FM I or FM II, while 331 patients did not have a positive reaction to the individual fragrances of the FMs.

In 42.2% of FM I-positive patients and in 39.1% of FM II-positive patients we did not observe positive reactions to an individual fragrance substance from the corresponding mix.

Patients sensitised to individual fragrance substances in FM I and FM II, among those patch tested with a specific fragrance series (n = 1013)

Substance	Positive reaction, n/N (%)	95% CI
FM I		
Geraniol	152/1013 (15%)	13.0 - 17.3
Isoeugenol	138/1013 (13.6%)	11.6 - 15.9
Evernia prunastri	126/1013 (12.4%)	10.5 - 14.6
Cinnamyl alcohol	108/1013 (13.6%)	8.9 - 12.7
Cinnamal	96/1013 (9.5%)	7.8 - 11.4
Eugenol	80/1013 (7.9%)	6.4 - 9.7
Hydroxycitronellal	71/1013 (7%)	5.6 - 8.7
Amyl cinnamal	22/1013 (2.2%)	1.4 - 3.3
FM II		
Lyral	147/1013 (14.5%)	12.5 - 16.8
Citral	101/1013 (10%)	8.3 - 12.0
Citronellol	39/1013 (3.8%)	2.8 - 5.2
Farnesol	28/1013 (2.8%)	1.9 - 4.0
Coumarin	23/1013 (2.3%)	1.5 - 3.4
Hexyl cinnamal	21/1013 (2.1%)	1.4 - 3.1

The suppliers of the haptens used for patch testing in our study were not the same in all centres. The baseline series were supplied by Chemotechnique Diagnostics (Vellinge, Sweden), TROLAB (Almirall Hermal, Reinbeck, Germany), allergEAZE (Calgary, Alberta, Canada), and SmartPractice (Phoenix, Arizona) (TRUE Test).

Editor's Notes on patch test products used:

1. The "Chemotechnique" patch test products are manufactured by, and available from Chemotechnique MB Diagnostics AB of Sweden.
2. "TROLAB" patch test products are no longer available.
3. The "allergEAZE" patch test products are manufactured in Germany by SmartPractice Europe, and are available from SmartPractice Canada.
4. The "TRUE Test" patch test system is manufactured by SmartPractice Denmark and is available from SmartPractice USA.

The centres using the TRUE Test added HICC or FM II from Chemotechnique or allergEAZE.
A recent published report of our group includes additional information on these providers. (Silvestre JF, Mercader P, González-Pérez R, et al. Sensitization to fragrances in Spain: a 5-year multicentre study (2011-2015). Contact Dermatitis. 2019; 80(2): 94- 100. https://doi.org/10.1111/cod.13152)

The fragrance series in our study were supplied by Chemotechnique or allergEAZE:
both series contained the same FM ingredients, but the concentrations of all FM I fragrance components other than cinnamal were twice as high in the Chemotechnique series as in the allergEAZE series. Cinnamal had the same concentration in both.

Our findings suggest that patch testing the FM II ingredients is especially important for determining the haptens involved in hand, facial, atopic, and occupational dermatitis.

Using TRUE Test (which contains FM I and MP but does not contain HICC or FM II) in these populations cannot detect possible sensitizations to HICC, citral, farnesol, citronellol, α-hexyl cinnamal, and coumarin. Being aware of our results, physicians who only perform TRUE Test may consider adding the FM II to all patients tested, and the individual haptens in FM II in the aforesaid special populations.

Some studies have reported that the FM I in the TRUE Test detects fewer cases than the FM I and MP of other petrolatum-based, investigator-loaded test systems.

We used two specific fragrance series with different components and different concentrations of FM I ingredients. We may have underestimated the frequency of sensitization to individual components of FM I, especially when testing with lower concentrations.

Article #3:
A Negative Breakdown Test in a Fragrance Mix I positive Patient does not rule out Contact Allergy to its Fragrance Constituents

The IVDK is a network of, currently, 58 departments of dermatology in Germany, Switzerland, and Austria dedicated to the study of the clinical epidemiology of contact allergy.

Ideally, patch testing is done using a chemically defined compound like, for example, methylisothiazolinone, nickel ions, or an epoxy resin oligomer, in order to identify the hapten to which the individual patient is sensitized. However, for screening purposes, hapten mixes (e.g., fragrance mixes I and II), have been in use for decades. Fragrance mix I (FM I), consisting of eight fragrances (seven defined chemicals and oakmoss absolute), was established in the 1970s.

Considering the immunological concept of contact allergy, one should expect that a positive (allergic) patch test reaction to this mix indicates sensitization to at least one of its constituents, which can be confirmed by patch testing the single FM I components. However, it has been well-known for decades that this is not always the case. From earlier IVDK data analyses, we know that about 45% of FM I-positive patients do not react to any of the eight single fragrance components, when patch tested at 1% pet.
How can this be explained?

We have discussed three potential answers to this question…

1. Weak positive reactions to FM I are, to a large extent, false-positive, irritant reactions, owing to the comparably high overall hapten concentration of 8% plus 5% sorbitan sesquioleate (SSO) as an emulsifier. Patch testing with only 1% of any fragrance material does not elicit such irritant reactions in these patients.

2. A weak positive reaction to FM I, but not to any of the single fragrance compounds, points to a low-grade sensitization, not eliciting a reaction to the single fragrance compound at 1%. Co-exposure to other, in sum more or less irritant, fragrance materials lowers the elicitation threshold in these patients so that a notable reaction occurs. Furthermore, it has been shown that combined fragrance exposure enhances induction as well as elicitation responses, which may be due to unspecific immunological as well as permeation enhancing effects.

3. Patch test concentration of some of the single fragrance compounds is too low, leading to false-negative test reactions in the breakdown test. In his original study on perfume dermatitis, Larsen tested several single fragrances at higher concentrations, and so did the European Environmental and Contact Dermatitis Research Group in the 1980s. In 1993, de Groot et al also recommended higher patch test concentrations for single fragrances contained in FM I. This proposal was adopted in several European countries, especially in Sweden and the UK, but not in Germany.

In about half of the patients reacting positive to fragrance mix I (FM I), breakdown testing remains negative. This raises the question of whether the reaction to FM I is false-positive, or the breakdown test is false-negative.

Not every positive reaction to FM I in patients with negative breakdown tests is false-positive. There may be false-negative reactions to the single fragrance components when patch tested at 1% pet. Raising patch concentrations of some single fragrances is recommended.

In several European patch test centres, amyl cinnamal, cinnamyl alcohol, eugenol, and geraniol are patch tested at 2% instead of 1% because the higher concentration seems more suitable for diagnostic purposes. In some centres, even all FM I fragrances are (or have been) patch tested at 2% pet. in the breakdown test. Hence it seems like the FM I breakdown with all fragrances tested at 1% pet. gives some false-negative results.

Hence, for eugenol too, a test concentration of 1% was obviously too low to detect all sensitized patients.

From our data, we can conclude that by far, not every positive reaction to FM I in patients with a negative breakdown test is false-positive. It rather seems that there are false-negative reactions to the single FM I fragrance components when patch tested at 1% pet.

To overcome this problem, and to better identify individuals sensitized to fragrances, test concentrations of several single fragrances should be raised, corresponding to customary practice in Sweden, North America, and the UK. In particular, we recommend raising patch test concentrations of:

(a) amyl cinnamal to (at least) 2%, because the chemically closely related hexyl cinnamal is tested at an even higher concentration (10% pet.) without any problems;

(b) eugenol to 2%, because reactions to clove oil (2% pet.) suggest a higher prevalence of sensitization than detected by eugenol 1% pet.;

(c) geraniol to 2%, because reactions to citral and lemongrass oil suggest that geraniol 1% pet. does not detect all corresponding sensitizations, and a Swedish investigation has demonstrated that geraniol at higher concentrations is not irritant.

Article #4:
Patch test results with fragrance markers of the baseline series – analysis of the European Surveillance System on Contact Allergies (ESSCA) network 2009–2012

In addition, recent findings have indicated that oxidized forms of certain fragrances, such as limonene and linalool, have a higher sensitizing potential and should be preferred for diagnostic patch testing.

The results obtained with the TRUE Test® point towards an important technical detail. The prevalence of positive reactions was relatively low for all three haptens available in this system. Considering that the majority of patients were tested in Groningen (The Netherlands), the differences from the results obtained with the pet.-based FM I and M. pereirae are striking. The second test centre in The Netherlands was the Free University department in Amsterdam, and provided almost exclusively data obtained with pet.-based haptens; it may therefore be responsible for the high figures (for FM I, 12.7% of 2821 patients positive). In the two departments, FM II was tested in pet. on 4274 patients, as it is not available in the TRUE Test®. Interestingly, with this pet.-based hapten, the sensitization prevalence rates were very similar (see footnote to Table 2). This may point to FM I of the TRUE Test® having lower sensitivity for detecting contact allergy than the pet. -based test system, although other explanations may also be valid.

In a study from Israel on 207 patients, the concordance between various haptens tested with the TRUE Test® and with investigator-loaded IQ Chambers™ was studied: high concordance was found for methylchoroisothiazolinone (MCI)/methylisothiazolinone (MI), nickel sulfate, formaldehyde, and p-phenylenediamine (81.5% to 72.7%), moderate concordance was found for quaternium-15, potassium dichromate, and fragrance mix (66.7 to 58.1%), and low concordance was found for cobalt chloride and M. pereirae (27.6 to 18.2%). In this study, among a group of 18 patients reacting to FM I and 'with demonstrated exposure' (i.e., clinical relevance to fragrances), 50% reacted to both IQ Chambers™ and the TRUE Test®, 44% reacted only to FM I IQ Chambers™, and 6% reacted only to FM I TRUE Test®.

Editor's Notes on patch test products used:
When referring to "IQ Chambers" above, these are the patch test chambers manufactured by Chemotechnique of Sweden, which are in this study used together with the Chemotechnique patch test haptens.

In another study on 167 patients in the United States, the Finn Chambers® system was found to be superior in detecting clinically relevant allergies to FM I, M. pereirae, and thiuram mix, whereas the TRUE Test® was found to be more sensitive for nickel, neomycin, and MCI/MI (33). Therefore, patch test results may differ with the test system used; for FM I in general, the TRUE Test® yields lower reactivity with fewer irritant reactions, which is also apparent in this study (and slightly better reproducibility), but with the drawback of relevant contact allergies being missed.
Editor's Notes on patch test products used:
When referring to "Finn Chambers" above, these are the patch test chambers manufactured by SmartPractice of USA, which are in this study used together with the allergEAZE patch test haptens.

Together, these findings indicate that the TRUE Test® sensitivity for screening fragrance contact allergy is definitely lower than that of the pet.-based chamber system. The test concentration of FM I in the TRUE Test® system has not been changed since its inauguration, and needs to be re-evaluated.

In conclusion, the three new papers from June 2021 illustrate that there are still pitfalls, inefficiencies and less-than-optimal test products and practices within the realm of fragrance allergy. Dermatologists would do well to heed the good advice and recommendations for test products and procedures derived from these and previous relevant research papers, and manufacturers should also strive to further improve their testing products to comply with these recommendations.

For information on the various haptens available from Chemotechnique for testing fragrance allergy, please see the Hapten of the Quarter section of this issue of The Patch Tester.

What's new at Chemotechnique?

Winner of the signed "Common Contact Allergens" Handbook!

First of all, needless to say, we were overwhelmed by the participation and the positive feedback on The Patch Tester e-Mag that we gained from the Common Contact Allergen competition in our previous issue #6. Thank you so much!
Secondly, we are happy to announce that Ljubica Stojkovska is the proud winner of a signed copy and will receive her prize shortly.
We wish to thank all participators and to congratulate Ljubica once again!

Hapten of the Quarter

Fragrance Mix

Fragrances constitute a very frequent cause of Allergic Contact Dermatitis, and the many research studies published over the years and recently confirm that that the clinical issue is still not satisfactorily managed.

According to current pathophysiological concepts, contact sensitisation (Gell & Coombs type IV-sensitisation) is a T-cell-mediated immunological reaction that is directed to a specific hapten.

The gold standard for diagnosing contact sensitisation is patch testing, because it includes all the relevant steps for eliciting an allergic late phase reaction (dermatitis) in a sensitised individual:

1. Penetration of the hapten through the epidermal barrier
2. Protein binding
3. Interaction with dendritic cells
4. Presentation to specifically primed T-lymphocytes and, finally,
5. Elicitation of a dermatitis reaction by attraction of pro-inflammatory cells.

Ideally, patch testing is done using a chemically defined compound like, for example, methylisothiazolinone, nickel ions, or an epoxy resin oligomer, in order to identify the hapten to which the individual patient is sensitised. However, for screening purposes, hapten mixes (e.g., fragrance mixes I and II), have been in use for decades, but they are not without their inherent problems, of apparent false negative results and apparent false positive results for the mixes.

Many research papers have been published that have proposed an increased concentration of the individual fragrances or haptens in order to reduce the incidence of apparent false negative results for the individual haptens.

The two global manufacturers of “investigator-loaded” patch test haptens offer different ranges of haptens for fragrances and related substances.

Below is a complete range of the haptens available from Chemotechnique, along with links to relevant hapten information in the Chemotechnique website, as well as links to SDS documents available for download from the Chemotechnique website.

We encourage you to sign up to the Chemotechnique website at www.chemotechnique.se so that you can access all the available information, and therefore gain the maximum knowledge and professional benefit.

F-1000 Fragrance Series

The Chemotechnique Fragrance Series contains chemicals and substances which one can be exposed to when using perfumes and beauty products. However, perfumes and fragrances are also used in a multitude of household products such as cleaning products, as well as in many industrial products.

There are in total 48 different haptens including 2 Mixes available from Chemotechnique.

The Fragrance Series contains substances which are used for obtaining pleasant odours, preservation, as well as aid products in the formulation of commercial fragrances.

For the Chemotechnique Information Sheet for each individual hapten, (or Mix) click on the hapten name link in the list of haptens below, to download the relevant .pdf file on the individual hapten.

The Chemotechnique Fragrance Series F-1000 comprises the following haptens

#	Art.No	Name	Conc.
1.	C-014	CINNAMAL	1.0% pet
2.	C-013	CINNAMYL ALCOHOL	2.0% pet
3.	A-014	AMYL CINNAMAL	2.0% pet
4.	E-016	EUGENOL	2.0% pet
5.	I-002	ISOEUGENOL	2.0% pet
6.	G-001	GERANIOL	2.0% pet
7.	O-001	Oakmoss absolute	2.0% pet
8.	H-008	HYDROXYCITRONELLAL	2.0% pet
9.	N-006	Narcissus poeticus absolute	2.0% pet
10.	M-021	Musk xylene	1.0% pet
11.	M-028	METHYL ANTHRANILATE	5.0% pet
12.	M-019	Musk moskene	1.0% pet
13.	M-018	MUSK KETONE	1.0% pet
14.	J-001	Jasmine synthetic	2.0% pet
15.	B-010B	BENZYL SALICYLATE	10.0% pet
16.	B-008B	BENZYL ALCOHOL	10.0% sof
17.	V-001	VANILLIN	10.0% pet
18.	L-001	Lavender absolute	2.0% pet
19.	C-002	Cananga oil	2.0% pet
20.	R-003	Rose absolute	2.0% pet
21.	Y-001	Ylang ylang oil	2.0% pet
22.	G-002	Geranium oil	2.0% pet
23.	J-002	Jasmine absolute	2.0% pet
24.	S-009	Sandalwood oil	2.0% pet
25.	L-003	Lyral	5.0% pet
26.	C-036	CITRAL	2.0% pet
27.	F-004	FARNESOL	5.0% pet
28.	C-037	CITRONELLOL	1.0% pet
29.	H-025	Hexyl cinnamic aldehyde	10.0% pet
30.	C-038	COUMARIN	5.0% pet
31.	Mx-25**	Fragrance mix II	14.0% pet
32.	A-036	Amyl cinnamyl alcohol	5.0% pet
33.	A-037	Anise alcohol	10.0% sof
34.	B-038	BENZYL BENZOATE	10.0% pet
35.	B-039	BENZYL CINNAMATE	10.0% pet
36.	B-040	BUTYLPHENYL METHYLPROPIONAL	10.0% pet
37.	E-026	Treemoss absolute	1.0% pet
38.	I-017	alfa-Isomethyl ionone	10.0% pet
39.	L-006C	D-Limonene	10.0% pet
40.	L-005B	LINALOOL	10.0% pet
41.	M-034	Methyl-2-octynoate	0.2% pet
42.	M-033	Majanthole	5.0% pet
43.	H-031A	Hydroperoxides of Linalool	1.0% pet
44.	H-032A	Hydroperoxides of Limonene	0.3% pet
45.	Mx-08*	Perfume mix	6.0% pet
46.	H-031B	Hydroperoxides of Linalool	0.5% pet
47.	H-032B	Hydroperoxides of Limonene	0.2% pet
48.	S-008	Styrax	2.0% pet

* **Fragrance mix I (Mx-08) comprises the following haptens.**

Art.No	Name	Conc.
E-016	EUGENOL	1.0% pet
G-001	GERANIOL	1.0% pet
I-002	ISOEUGENOL	1.0% pet
H-008	HYDROXYCITRONELLAL	1.0% pet
C-014	CINNAMAL	1.0% pet
C-013	CINNAMYL ALCOHOL	1.0% pet

Also contains 1% sorbitan sesquioleate as emulsifier.

** **Fragrance mix II (Mx-25) comprises the following haptens.**

Art.No	Name	Conc.
H-025	Hexyl cinnamic aldehyde	5.0% pet
L-003	Lyral	2.5% pet
F-004	FARNESOL	2.5% pet
C-038	COUMARIN	2.5% pet
C-036	CITRAL	1.0% pet
C-037	CITRONELLOL	0.5% pet

From the Chemotechnique Information Sheet for each hapten it is then possible to access the Safety Data Sheet (SDS) on each individual hapten, as well as the Patient Information Sheet for each hapten, (in several languages), as well as information on synonyms and uses.

If you have any questions, or require any further information, or recommendations or expert advice on the choice of fragrance haptens or on any individual haptens, then please contact Chemotechnique here.

Hot Topic

Hand Dermatitis

This review article discusses the aetiology and pathogenesis of occupational ICD with additional focus on treatment and interventions that can be made at an institutional and even national level for education and prevention of ICD resulting from frequent hand hygiene.

Occupational contact dermatitis accounts for 95% of all cases of occupational skin disease with irritant contact dermatitis (ICD) constituting 80% to 90% of these cases. Health care workers, hairdressers, and food service workers are typically most affected by occupational ICD of the hands as these occupations require frequent hand hygiene and/or prolonged exposure to water, also known as “wet work.”

In the context of the current COVID-19 pandemic, frequent hand hygiene has become a global recommendation for all individuals, and new workplace guidelines for hand sanitisation and surface sterilisation are affecting occupations not previously considered at risk of excessive wet work, including grocery or retail workers, postal workers, sanitisation workers, and others.

Occupational irritant contact dermatitis of the hands affects workers in many occupations, although it is observed most frequently in health care workers (HCWs). The true rate of cases is likely much higher as cases frequently go unreported, particularly in the health care sector.

The rise in health care–associated infections observed in the last several decades prompted international campaigns for increasing hand hygiene in the health care setting, which has been accompanied by an increased incidence of hand OICD.

As the act of hand hygiene cannot be reduced or eliminated in the setting of health care, these cases often become chronic and debilitating when left unrecognised and untreated. Hand dermatitis has been shown to significantly impact quality of life, both professional and personal, and leads to missed days of work and, in severe cases, change in career or early retirement with significant financial implications on a personal and societal level.

In 1985, the national annual medical and indemnity cost of occupational skin disease was estimated to be between $222 million and $1 billion in the United States, whereas more recently, it was estimated that in the European Union approximately $5 billion is lost annually because of lost wages, lost productivity, and medical expenses for OCD.

The current climate of a global COVID-19 pandemic presents new challenges with regard to hand OICD. In the health care setting, recommended protocols have increased frequency of hand hygiene to include not only performing hand hygiene before and after patient care but also before and after application of personal protective equipment (PPE).

Further, the Environmental Protection Agency released guidelines for surface disinfectants that target SARS-CoV-2 with many of the approved products containing known skin irritants or haptens.

Traditionally, the greatest risk of OICD of the hands has been attributed to professions with frequent handwashing and/or wet work; however, in the setting of the COVID-19 pandemic, increased hand hygiene and exposure to harsh surface disinfectants have become a universal practice extending to all customer-facing occupations.

This article reviews the pathogenesis, triggers, and treatment of hand OICD, as well as system-wide approaches to early intervention and treatment, which have traditionally been thought of as health care specific, although now it may apply more broadly to many occupations

For further information please see the article stated below, which is reviewed further below :
Hand Dermatitis in the time of COVID-19: A Review of Occupational Irritant Contact Dermatitis
By Anna Kersh, et al. in Dermatitis, Volume 32, Issue 2, March-April 2021, pp 86-93.

Hand Dermatitis in the time of COVID-19: A Review of Occupational Irritant Contact Dermatitis

by Anna Kersh, et al.

in Dermatitis, Volume 32, Issue 2, March-April 2021, pp 86-93.

AETIOLOGY

Allergic contact dermatitis is the result of a delayed type IV hypersensitivity reaction to a hapten, which elicits an adaptive immune response, specifically hapten specific CD4 T lymphocytes.
After the initial exposure or sensitization, cutaneous re-exposure to the hapten will elicit a brisk T-lymphocyte response that results in the typical erythema, vesiculation, pruritus, and/or scaling observed in ACD.

Contact urticaria is a type I hypersensitivity reaction that can be accompanied by systemic symptoms such as rhinitis, conjunctivitis, wheezing, and in rare but severe cases anaphylactic shock.

Although each variant of contact dermatitis represents a distinct entity with its own pathophysiology; a single patient can be affected by multiple types of contact dermatitis. A Danish study demonstrated that ICD was responsible for 70% of cases of OCD, ACD constituted 15%, whereas an additional 10% was caused by a combined presence of ICD and ACD.

OCCUPATION-SPECIFIC IRRITANTS

Although ICD is highly prevalent in the health care field, it is also a concern across many industries involving various irritant exposures.

Wet work is well documented as the largest contributing irritant exposure to the development of OICD. Wet work has been loosely defined as:

(1) hands regularly in a wet environment for more than 2 h/d,
(2) frequent hand washing (>20 times/d),
(3) use of hand disinfectants 20 times in a working day,
(4) use of protective gloves for more than 2 h/d or change of gloves more than 20 times/d.

Health care workers understandably account for a significant portion of the workforce involved in wet work; however, hairdressers, cleaning personnel, and food service workers also encounter significant wet work, as well as exposure to other irritants.

In addition, skilled manual workers (such as craftsmen, construction workers, mechanics, technicians, and metalworkers) are also at risk of OICD, especially through exposure to both mechanical traumas and irritating substances.

In the era of COVID-19, it is noteworthy that many professions not previously thought to endure significant exposure to wet work would now meet the aforementioned criteria for significant exposure because of hand hygiene practices, including those in customer-facing positions or other essential workers such as retail / grocery workers, sanitation workers, and postal workers.

A recent review elegantly described the irritants contained in hand sanitisers and detergents used in the health care setting as related to the COVID-19 pandemic. Prolonged occlusion from rubber

gloves is also considered an irritant exposure, even when unaccompanied by wet work. This is largely because of the humidity generated under occlusion, leading to prolonged skin exposure to moisture (primarily sweat), which compromises the skin barrier. This is also relevant to note in the midst of the current pandemic, given the increased use of medical-grade gloves by the general public.

Cleaning agents, detergents, and disinfectants contribute an additional risk to developing OICD.

The occupations impacted by ICD extend beyond those listed here, ranging from agriculture workers immersed in soil and dust, to mail carriers and office workers exposed to paper irritants.

The National Institute for Occupational Safety and Health labelled the prevention of OICD “imperative” because of its poor prognosis and the constant introduction of potential irritants into the workplace each year. Given that all fields are likely to experience an exacerbation of OICD with the rise in necessary hand hygiene and cleaning precautions surrounding the COVID-19 pandemic, it is now more important than ever to recognise the breadth of the problem across different occupations and specific irritants so as to properly spread prevention tactics and treatment knowledge to all employees.

TOPICAL TREATMENTS

The definitive treatment of ICD of any cause is the identification and avoidance of the causative agent. If complete avoidance cannot be attained, PPE can be used to protect from exposure to the irritant and subsequent disease worsening. However, frequently, patients are unable to completely remove an irritant from their daily work requirements. Various topical therapies have been demonstrated to help alleviate symptoms and reduce inflammation.

Emollients

Emollients offer an effective and accessible option for treating ICD, and function by attracting water to and softening the stratum corneum and thereby reducing TEWL. Several studies have demonstrated the efficacy of emollients to decrease irritation and restore barrier function; of note, most studies have been done on experimentally induced irritated skin. Six commonly used lipid-rich moisturisers were demonstrated to be effective in reducing erythema, scaling, and TEWL in skin irritated by SLS. The use of moisturisers with higher lipid content, such as petrolatum, was shown to improve barrier function more rapidly than less lipid-rich moisturisers. Petrolatum, an occlusive, slows and reduces TEWL. Other occlusives include lanolin, mineral oil, vegetable oils, beeswax, ceramides, and silicones. Their high lipid content is crucial in barrier recovery. Regular application of moisturisers to normal skin offers a protective effect against repeated exposure to irritants, and thus regular use among HCWs may prevent development of ICD. The proper use of emollients and compliance with daily care are important behaviours for treatment success in ICD and represent a huge obstacle to treatment. A recent study demonstrated that hand eczema patients who received text message reminders used moisturiser more frequently and had decreased severity of disease and overall improved treatment success.

Humectants

Humectants are hydrophilic substances that attract water from the deeper epidermis, dermis, and atmosphere to the stratum corneum. Natural moisturising factor functions as the predominant endogenous humectant, whereas topical urea is the classic humectant used therapeutically in clinic. Other compounds that function as humectants include amino acids, glycerine, sorbitol, lactic acid, and other sugars, which are often combined with an occlusive emollient in commercial products. Barrier function, skin hydration, and clinical symptoms are all significantly improved compared with an untreated control site.

Barrier Creams

Barrier creams aim to protect the skin from contact with exogenous irritants. They are designed to prevent or delay penetration and absorption of irritants, to reduce the risk of developing and worsening ICD. Ideally, barrier creams should also improve stratum corneum hydration to maintain skin integrity and epidermis barrier function. Although there is not one definition for barrier cream composition, the Food and Drug Administration came out with a finite list of approved active ingredients and their concentrations for skin barrier protection. Despite their approval, the efficacy of barrier creams in preventing and treating ICD is not entirely clear. Application dose and technique also should be considered when counselling patients and evaluating efficacy of therapeutic intervention. Emphasise should be placed upon the importance of workplace application education, because when inadequately applied, products that may have been proven to have protective potential will lose efficacy. Although barrier creams are commonly used and recommended, quality evidence of their effectiveness is still lacking, and better-standardised studies are needed.

Topical Corticosteroids

Topical corticosteroids are routinely used in the treatment of ICD, although controversy regarding their efficacy remains. One study found a dose-dependent treatment response for the corticosteroids and demonstrated clobetasol propionate to be more effective than triamcinolone acetonide on SLS-irritated skin. In a double-blind, vehicle-controlled study, betamethasone valerate significantly reduced TEWL on experimentally induced irritant skin reactions. However, other studies have called its efficacy into question and raised concern about the adverse effects of prolonged therapy and detrimental effects on the skin barrier. Although topical corticosteroids reduce inflammation and can provide symptomatic relief, long-term use may impair restoration of lipids in the stratum corneum, thus leading to new treatment challenges.

Calcineurin Inhibitors

The use of topical calcineurin inhibitors in treatment of ICD remains off-label because data are limited and somewhat controversial. Although some studies have shown topical calcineurin inhibitors to be effective in treatment, others have found them to be ineffective and potentially irritating. Conflicting results may reflect differences in compounds, concentrations, level, or irritant, as well as exposure.

For further information, please read the original article.

Dear Reader, if you have any particular article or book or website that you would like to have reviewed in a future issue of The Patch Tester, then please contact the Editor here.

ARIA-EAACI statement on severe allergic reactions to COVID-19 vaccines - an EAACI-ARIA position paper

by Ludger Klimek, et al.
in Allergy, December 30, 2020.

Published online ahead of print, at https://onlinelibrary.wiley.com/doi/epdf/10.1111/all.14726

Coronavirus disease 2019 (COVID-19) Vaccine BNT162b2 received approval and within the first few days of public vaccination several severe anaphylaxis cases occurred. The vaccine will be administered to a large number of individuals worldwide and concerns raised for severe adverse events might occur.

With the current information, the European Academy of Allergy and Clinical Immunology (EAACI) states its position for the following preliminary recommendations that are to be revised as soon as more data emerges.

To minimise the risk of severe allergic reactions in vaccinated individuals, it is urgently required to understand the specific nature of the reported severe allergic reactions, including the background medical history of the individuals affected and the mechanisms involved. To achieve this goal all clinical and laboratory information should be collected and reported.

Mild and moderate allergic patients should not be excluded from the vaccine as the exclusion of all these patients from vaccination may have a significant impact on reaching population immunity.

Health care practitioners vaccinating against COVID-19 are required to be sufficiently prepared to recognise and treat anaphylaxis properly with the ability to administer adrenaline.

A mandatory observation period after vaccine administration of at least 15 minutes for all individuals should be followed.

The current data has not shown any higher risk for patients suffering from allergic rhinitis or asthma and this message should be clearly stated by physicians to give our patients trust.

The benefit of the vaccination clearly outweighs the risk of severe COVID-19 development including the more than 30% of the population suffering from allergic diseases.

Allergic reactions to vaccines
Epidemiologic data from different studies showed that allergic reactions to vaccines are rare but may occur as often as 1 per 1,000,000 or up to 30 per 100,000 vaccinations and can cause anaphylactic reactions.

The lifetime prevalence of anaphylaxis is currently estimated at up to 5% in the USA and 3% in Europe.

Vaccine components described to cause allergic reactions include residual animal proteins, antimicrobial agents, preservatives, latex from sealing the vaccine ampoules, stabilizers, adjuvants and the active component, i.e., the antigen inducing the immune response.

Individual vaccine ingredients that may trigger anaphylaxis include egg protein, gelatine, milk proteins, other additives, and compounds present in trace amounts originating from the manufacturing process.

The novel BNT162b2 vaccine BNT162b2 is “temporarily licensed” in the UK and the USA for active immunisation to prevent COVID-19 disease caused by the SARS-CoV-2 virus in people 16 years of age and older.

This vaccine is administered intramuscularly at the 0.3 ml final volume twice at a manufacturer-recommended interval of 21 days. COVID-19 protection cannot be expected earlier than at least seven days after the second dose of the vaccine.

The vaccine is packaged in multi-dose vials and the concentrate must be diluted prior to use. Neither an adjuvant nor a preservative is included.

- The excipients listed are:
- ALC-0315 (((4- hydroxybutyl)azanediyl)bis(hexane-6,1-diyl)bis(2-hexyl decanoate))
- ALC-0159 (2-[(polyethylene glycol)-2000]-N,N-ditetradecylacetamide)
- 2-distearoyl-sn-glycero-3 phosphocholine
- Cholesterol
- Potassium chloride
- Potassium dihydrogen phosphate
- Sodium chloride
- Disodium hydrogen phosphate dihydrate
- Sucrose
- Water.

One vial (0.45 ml) contains five doses of 30 µg of highly purified, single-stranded, 5’-capped mRNA (BNT162b2 RNA), which is produced by cell-free in vitro transcription on an appropriate DNA template and encodes the viral spike (S) protein of SARS-CoV-2.

This mRNA is embedded in lipid nanoparticles. mRNA is easily absorbed by mononuclear phagocytes and rapidly degraded by ribonucleases. Due to its negative electric charge and high molecular weight, it poorly penetrates cell membranes. Consequently, mRNA used in a vaccine requires a protective cover. In this case, lipid-based nanoparticles (LNP) are used as non-viral vectors. Cationic lipids coat the polyanionic mRNA with their tertiary or quaternary amines complemented with zwitterionic lipids that mimic the phospholipids of the cell membrane. Cholesterol stabilises the lipid bilayer of the nanoparticle.

Polyethylene glycol (PEG)-modified lipids provide a hydration shell that improves the aqueous solubility of the LNPs. PEG, also known as macrogol, is a polyether compound widely used as an additive in cosmetics, pharmaceuticals, and the food industry. PEG molecular weight ranges from 200 g/mol to 10,000,000 g/mol. Allergic reactions have been reported after its use in a wide range of medications and cosmetic products. PEG may be a potential haptenic component included in the vaccine.

For further information, please read the original article.

EAACI statement on the Diagnosis, Management and Prevention of Severe Allergic Reactions to COVID-19 Vaccines

by Milena Sokolowska, et al.

in Allergy, January 16 2021.
Published online ahead of print, at https://doi.org/10.1111/all.14739

Editor's Note: This is a very comprehensive and authoritative article; therefore the reader is strongly recommended to read the original article:

The first approved COVID-19 vaccines include Pfizer/BioNTech BNT162B2, Moderna mRNA-1273 and AstraZeneca recombinant adenoviral ChAdOx1-S. Soon after approval, severe allergic reactions to the mRNA-based vaccines that resolved after treatment were reported.

Regulatory agencies from the European Union, Unites States and the United Kingdom agree that vaccinations are contraindicated only when there is an allergy to one of the vaccine components or if there was a severe allergic reaction to the first dose.

This position paper of the European Academy of Allergy and Clinical Immunology (EAACI) agrees with these recommendations and clarifies that there is no contraindication to administer these vaccines to allergic patients who do not have a history of an allergic reaction to any of the vaccine components.

Importantly, as is the case for any medication, anaphylaxis may occur after vaccination in the absence of a history of allergic disease. Therefore, the authors provide a simplified algorithm of prevention, diagnosis and treatment of severe allergic reactions and a list of recommended medications and equipment for vaccine centres. We also describe potentially allergenic / immunogenic components of the approved vaccines and propose a workup to identify the responsible hapten.

Close collaboration between academia, regulatory agencies and vaccine producers will facilitate approaches for patients at risks, such as incremental dosing of the second injection, or desensitisation.

Key messages

• Unless the patient has a history of an allergic reaction to any of the vaccine components, there is no contraindication to the currently approved COVID-19 vaccines (Pfizer/BioNTech BNT162B2, Moderna mRNA-1273, AstraZeneca recombinant adenoviral ChAdOx1-S)

• Allergy to drugs, food, insect venoms or inhalant allergens (house dust mites, pollens, animal dander, moulds) is not a contraindication for any vaccines, including COVID-19 vaccines

• Observation time after vaccination should be at least 15 minutes

• Some people require longer observation and monitoring of vital signs (patients with history of severe allergic reactions, with uncontrolled asthma, with mast cell disorders)

• Severe allergic reactions can happen even in people without history of allergic disease

• Anaphylaxis is a life-threatening condition, but it resolves without sequelae when managed quickly and appropriately

• COVID-19 vaccination centres and staff should be prepared to:
- Recognise the symptoms of anaphylaxis as early as possible
- Promptly treat anaphylaxis with epinephrine.
- Start adequate intravenous volume substitution.
- Activate further emergency medical services while continuing to monitor/treat the patient.

• Patients who had a severe allergic reaction after the first dose of COVID-19 vaccination should be referred to the allergy centre for the workup

• Unless it is confirmed by an allergy specialist that the vaccine did not induce the allergc reaction, they should not receive the second dose of the vaccine

• Allergy clinics should confirm the hypersensitivity/allergic background of the adverse reaction to the vaccine

• Partnership between academia, regulatory agencies and vaccine producers is needed to:
- Establish an efficient way for hypersensitivity/allergy workup
- Establish a safe way to administer second/booster dose of vaccine in patients who had severe allergic reaction after the first dose
- Establish safe protocols of desensitisation in patients who had severe allergic reaction after the first dose
- Answer the scientific questions about the mechanisms of these reactions.

Needs for diagnostic and preventive allergy workup in patients with severe allergic reaction after the first dose of COVID-19 vaccine

• Access to the vaccines and/or vaccine components (ideal scenario with the same batch of the vaccine)

• Skin prick and intradermal tests with the vaccines and their components

• In vitro tests with the vaccines and their components (basophil activation test [BAT], mast cell line assays, immunoassays, multi-epitope molecular assays)

• Validation of biomarkers (clinical and immunological) to predict and follow-up severe reactions

• Elaboration of protocols for modified dosing of the second (booster) COVID-19 vaccination in the allergy clinic and for desensitisation/immunotherapy to COVID-19 vaccine

• Recommendation of potential alternative COVID-19 vaccination(s) in case of confirmed allergic reaction to a first COVID-19 vaccine

For further information, please read the original article.

Allergic Contact Dermatitis and other Occupational Skin Diseases in Health Care Workers in the Finnish Register of Occupational Diseases in 2005–2016

by Kristiina Aalto-Korte, et al.

in Contact Dermatitis, Volume 84, Issue 4, March-April 2021, pp 217-223.

Also available online at **https://doi.org/10.1111/cod.13753**

Health care workers are an important risk group for occupational skin disease (OSD). The aim of the study was to review the diagnosis and causes of OSDs in health care workers in the Finnish Register of Occupational Diseases (FROD) in 2005–2016.

The authors searched the FROD for dermatological cases:
(a) in health care–related occupations defined by ISCO-08 and (b) in the industrial branch of health care defined by European industry standard classification system (NACE rev. 2).

Health care workers comprised 19% of all OSD cases in the FROD, and irritant contact dermatitis dominated the diagnoses.

Nurses and assistant nurses were the largest occupational groups with incidence rates of 3.3 and 2.7/10,000 person years, respectively.

Rubber chemicals were by far the most common causative agents of allergic contact dermatitis (ACD) followed by preservatives, the latter mainly comprising isothiazolinones and formaldehyde.

Acrylates were important haptens in dental professions.

Metals and coconut fatty acid derivatives were the next largest causative groups for ACD.

Drugs caused only 1% of the ACD cases.

The authors concluded that workers in different health care occupations do not have a uniform risk for OSD, but they share the risk for ACD due to rubber chemicals and various preservatives.

Although health care workers constitute a major risk group for occupational skin disease, studies on the incidences and causes of various OSD diagnoses in health care workers are not abundant.

The Finnish Institute of Occupational Health (FIOH) maintains the FROD. The data are provided by a coordinator of Finnish insurance institutions, Finnish Workers' Compensation Center, (that collects data from private insurance companies) and Farmers Social Insurance Institution. The register contains both recognised and suspected cases of occupational diseases determined by private insurance institutions. This study was restricted to the recognised cases, so excludes data on suspected cases. The register comprises data on, for example, occupation, branch of industry, up to three causes of occupational disease, and the respective diagnoses.

One case can have several different skin diagnoses—for example, ACD and irritant contact dermatitis.

As regards the registered causes of ACD, the analysis confirmed previous findings that rubber compounds form by far the most important hapten group, followed by preservatives.

In Denmark, rubber chemicals were the most common occupationally relevant contact haptens followed by biocides, perfumes, and nickel/cobalt (50, 13, 6, and 3 cases, respectively, in 2010).

In this study, isothiazolinones were the largest group of preservatives followed by formaldehyde and its liberators. Among the 16 isothiazolinone ACD cases, 7 were due to benzisothiazolinone (BIT). During the study period, there was a small epidemic of BIT allergy due to PVC gloves, and most cases were in dental professions.

In Finland, formaldehyde and its liberators have not lost their importance as causes of ACD in health care workers, which is in contrast with a finding in nurses in German-speaking countries.

There were no cases of perfume allergy (in the industrial-branch-specific search), and acrylates, our third largest group, were not among the reported allergic exposures in the Danish material.

Metals, mostly nickel, were the fourth largest hapten group in our material, which is in line with the previous Danish report.

In Australia in 1993–2014, rubber and preservatives were also the most important causative hapten groups in health care workers with occupational ACD.

Formaldehyde was the third most important cause in the Australian study, followed by coconut diethanolamide (CDEA), which caused three cases of ACD in our material. In our material, cocamidopropyl betaine–related haptens15 caused more cases than CDEA

The main causes of Allergic Contact Dermatitis (ACD) in the industrial-branch-specific search

Hapten group	Cases (N)	Share of all ACD cases
Details of some hapten groups; N indicates number of allergic patients		
Total number of ACD cases	**242**	
Rubber chemicals *Thiurams 50, benzothiazoles 3, 1,3-DPG 2, DETU 1, N-(cyclohexylthio) phthalimide 2, ZDMC 1, unspecified rubber chemicals 28*	**84**	**34.7%**
Acrylates *2-HEMA 3, MMA 3, EGDMA 1, bis-GMA 2, "epoxyacrylate resin/plastics" 1, "unspecified acrylates and methacrylates" 17*	**28**	**11.6%**
Isothiazolinones *MCI/MI 8, BIT 7, "unspecified isothiazolinone" 1*	**16**	**6.6%**
Formaldehyde	**14**	**5.8%**
Other preservatives/disinfectants *Glutaraldehyde 2, glyoxal 2, PHMB 1, PHMG 1, "saturated aliphatic aldehydes" 1, chlorotoluenesulfonamide 1, 'disinfectant' 5, "other antimicrobial" 1*	**14**	**5.8%**
Metals *Nickel 9, cobalt 3, chrome 1, mercury 1*	**14**	**5.8%**
Polyvinylchloride (PVC)	**6**	**2.5%**
Epoxy compounds	**4**	**1.7%**
Cocamidopropyl betaine -related	**6**	**2.5%**
Cocamide diethanolamine (CDEA)	**3**	**1.2%**
Ethanolamines	**3**	**1.2%**
Drugs *Local anaesthetics 1, gentamycin 1, cephalosporins 1*	**3**	**1.2%**
Colophonium	**2**	**0.8%**
Lanolin	**2**	**0.8%**

Abbreviations:
1,3-DPG: 1,3-diphenylguanidine **2-HEMA:** 2-hydroxyethyl methacrylate **bis-GMA:**bisphenolAglycerolatedimethacrylate
BIT: Benzisothiazolinone **DETU:** diethylthiourea **EGDMA:** ethylene glycol dimethacrylate
MCI/MI: methylchloroisothiazolinone/methylisothiazolinone **MMA:** methyl methacrylate
PHMB: polyaminopropyl biguanide **PHMG:** polyhexamethylene guanidine **ZDMC:** Zinc dimethyldithiocarbamate.

Facial Personal Protective Equipment: Materials, Re-sterilisation Methods, and Management of Occupation-Related Dermatoses

by JiaDe Yu, et al.
in Dermatitis, Volume 32, Issue 2, March-April 2021, pp 78-85.

The coronavirus infectious disease 2019 (COVID-19) caused by severe acute respiratory disease coronavirus is spread via respiratory droplets. To prevent infection, health care workers (HCWs) are required to don facial personal protective equipment (PPE), such as surgical/procedural masks and N95 respirators. Surgical masks and N95 respirators differ in their fit and ability to filter airborne particles. Surgical masks are designed to block large-particle sprays, splatter, droplets, and splashes. N95 respirators block at least 95% of 0.3-μm test particles.

Facial PPE dermatoses include irritant contact dermatitis, allergic contact dermatitis, acne, and contact urticaria.

The coronavirus infectious disease 2019 pandemic has resulted in health care workers donning personal protective equipment (PPE) for extended periods. It has also resulted in the increased use of facial PPE by HCWs triggering a rise in occupational dermatoses, with ICD likely most common. Elastic bands, metal nose rims, and undeclared formaldehyde may cause ACD.

We reviewed common mask re-sterilisation strategies and made recommendations on the prevention and management of facial PPE–related occupational dermatoses.

The need for facial PPE has resulted in an increase of facial PPE–associated occupational dermatoses, such as irritant contact dermatitis (ICD), allergic contact dermatitis (ACD), contact urticaria, and acne.

The aims of the study were to review facial PPE (surgical masks and N95 respirators), and their ingredients; to identify facial PPE re-sterilisation techniques, and to recommend strategies for prevention and management of facial PPE–related dermatoses.

Twenty-one facial PPE (11 N95 respirators, 10 surgical masks) were reviewed. Re-sterilisation techniques were identified. Personal protective equipment–induced occupational dermatoses and management strategies were explored.

Polypropylene is the most common chemical identified in facial PPE. Most masks contain aluminium at the nosepiece. Two surgical masks released nickel.

In Wuhan, China, 74.5% of HCWs caring for COVID-19 patients reported adverse skin reactions related to PPE, with the cheeks and nasal bridge being affected in 75.4% and 71.8%, respectively.

In addition, in an effort to maximize the availability of PPE, the US Food and Drug Administration has issued several Emergency Use Authorisations allowing for decontamination and re-sterilisation strategies, which in some cases include the application of chemicals to PPE.

Finally, there is a paucity of literature describing a recommended approach to the prevention and management of facial PPE–induced occupational dermatoses.

Mask Materials
The individual components of facial PPE are not well described. Material information was received for 21 facial PPE (11 N95 respirators, 10 surgical masks), all in use in the USA, but none supplied by manufacturers based in China.

Polypropylene, a rare hapten, was the most frequently identified component of the outer shell and filter of N95 respirators and the body of surgical masks. Polypropylene is melted during the synthesis of non-woven textiles, leading to formaldehyde by-products that may be incompletely removed, thereby leading to ACD. Allergic contact dermatitis to formaldehyde from the degradation of polypropylene during the routine use of face masks has also been described. Health care workers with mask-related facial dermatitis and known formaldehyde allergy should avoid polypropylene masks.

Polyester is another material used in facial PPE. Despite its prevalent use in clothing, allergy to polyester resin is rare. Irritant reactions to polybasic acids, polybasic alcohols, fiberglass, and/or acetone components of polyester are possible. In the occupational setting, patients are more often allergic to the cobalt accelerator used in the processing of polyester.

Ethylene-vinyl acetate (EVA) was identified in the outer shell and nose foam of N95 respirators. Ethylene-vinyl acetate itself is not a cause of contact allergy, but acetophenone azine, a newly described hapten used in foam materials such as shin pads and other sports equipment, has been identified in EVA-based materials. The authors theorised that acetophenone azine might be a catalyst in the polymerisation of EVA. Therefore, similar to the case of polypropylene, acetophenone azine–allergic patients could theoretically be at risk of ACD to masks containing EVA.

Polyurethane, present in many plastics and used as part of the foam nose cushion of masks, has been reported to cause ACD. However, reactions are frequently attributed to isocyanate resins, which are highly irritating and sometimes sensitising accelerators.

Polyethylene terephthalate was identified in face shields associated with surgical masks. This is a rare hapten, with 1 reported case of ACD to polyethylene terephthalate mesh in a cochlear implant.

Adhesives (such as acrylates) were noted in several N95 respirators and surgical masks. Acrylate ACD has been reported from nail products, pressure sensitive adhesives, and insulin pumps. In one series, 6% of patch-tested patients were allergic to acrylates.

Aluminium is present in the nosepiece and/or chin of N95 respirators and surgical masks. Allergic contact dermatitis to aluminium is uncommon. Several case reports of contact allergy to aluminium-based Finn Chambers have been described. Steel is occasionally used in the nose piece and staples of facial PPE. Although steel components can vary, it often includes nickel, a common hapten with a positivity rate of 17.5%. In our sample, 2 of the 4 surgical mask nose pieces were positive for nickel release.

Elastic straps used in facial PPE have been linked to contact allergy. Elastic straps contain rubber accelerators, which are used in the processing of raw rubber and are known haptens in occupational and non-occupational settings. Polyisoprene, another component of head straps, has been associated with ACD.

Dyes may also be a factor. In this study, with exception of “black ink,” mask manufacturers did not disclose the use of dye in facial PPE, although many masks have colour. One case report documented yellow pigment in an N95 respirator. Additional information on dyes present in medical masks is necessary.

Respirator Re-use and Decontamination
Because of the sudden increased need for PPE for HCWs, several methods of mask and respirator decontamination are being used. Hydrogen peroxide vapour decontamination, UV germicidal irradiation, and moist heat are currently advertised by the US Centers for Disease Control and Prevention as the most promising methods.

The main theoretical cutaneous risk with sterilised N95 respirators is ICD. Irritant contact dermatitis from N95 respirators exists at baseline, as has been described in several studies. However, the authors are not aware of reports of ICD specifically attributed to sterilised N95 respirators.

Allergic contact dermatitis and ICD to H_2O_2 are quite rare, with only a few known case reports. In addition, protocols dictate appropriate aeration of H_2O_2 during decontamination. For this reason, the authors believe that cutaneous reactions directly attributable to H_2O_2 in the setting of N95 respirator decontamination would be rare. Surveillance is needed to determine whether reusing masks after

decontamination increases exposure to mask components including haptens and irritants.

Facial PPE Occupational Dermatoses
Common cutaneous reactions to surgical masks and N95 respirators include ACD, ICD, acne, and contact urticaria. There are a number of consensus statements and guidelines already published on the subject, including strategies for management and avoidance. This section includes recommendations for cutaneous management, incorporates components of these published guidelines, and introduces additional strategies specific to dermatology practice.

Skin Care
General skin care management is recommended for all individuals using facial PPE. Individuals should wash their face with a gentle skin cleanser and apply daily moisturiser. The labels “hypoallergenic” and “gentle” are not regulated, making the selection of optimal products difficult. Other publications have covered the topic of recommended moisturisers, and hapten-specific databases can be used for identification of allergen-free products.

The British National Health Service (NHS) recommends that topicals be applied at least 30 minutes before PPE use, whereas a Portuguese group recommends 60 minutes, and the Wound, Ostomy, and Continence Nurses Society (WOCNS) recommends 1 to 2 hours. Our recommendation is that the chosen time interval between product application and donning of PPE needs to be sufficient to create a non-moist, non-tacky, non-macerated cutaneous surface.

ANATOMY-SPECIFIC MANAGEMENT STRATEGIES

Ears
Long-term use of face masks can lead to irritation behind the ears from elastic straps. Health care workers can consider alternating between surgical masks with ear loops and surgical masks with tie straps to decrease pressure. Thin dressings can be applied to contact areas around or behind the ears to relieve pressure from elastic straps. Some vendors have developed devices that allow users to attach straps behind the head to remove tension; examples include headbands affixed with buttons and plastic 3D–printed straps. The WOCNS states that this type of device modification is acceptable for surgical masks but cautions that they could alter the fit and performance of N95 respirators; guidance from local hospital policy should be obtained before using these devices with N95 respirators.
Nose and Cheeks
N95 respirators require a tight fit to achieve adequate seal and protection. The nasal bridge, nasal tip, and malar cheeks are common contact points.

Survey studies on the recent COVID-19 pandemic have identified prolonged mask use for more than 6 hours as a risk factor for adverse cutaneous reactions. Shorter use times, or longer breaks between shifts, could be considered. An expert panel from the Nurses Specialised in Wound, Ostomy and Continence Canada and a Portuguese group both recommend that PPE be removed, and pressure be relieved every 4 hours, whereas the National Pressure Injury Advisory Panel (NPIAP) recommends that if pressure relief is needed, users remove the mask for 15 minutes every 2 hours. Alternatively, the NPIAP recommends that pressure can be relieved by lifting the mask away from the face for 5 minutes every 2 hours. The NHS also recommends breaks every 2 hours.

Skin-protective topicals can be considered as long as they do not interfere with fit and safety. Options include silicone or dimethicone barrier creams, acrylate-based products, and other topical skin protectants. The NPIAP recommends against the use of petrolatum jelly, mineral oil, or other greasy topicals under N95 respirators.

The use of prophylactic dressings with N95 respirators is controversial; they should not be used unless approved by local hospital policy. The NPIAP stops short of endorsing occlusive dressings with N95 masks but provides guidance that if thin dressings are used, they can be cut into strips for the cheeks, nasal bridge, and behind the ears. Repeat fit testing should be performed with the dressing in place to ensure an appropriate seal. They also state that dressings should be considered contaminated and recommend that users close their eyes and hold their breath in exhalation during removal. The Portuguese group, NHS, and Nurses Specialised in Wound, Ostomy and Continence Canada have similar recommendations, and 2 provide photographs of anatomy-fitting shapes into which dressings can be cut. In contrast, the WOCNS recommends against use of dressings under N95 masks because they may interfere with fit.

DISEASE-SPECIFIC MANAGEMENT STRATEGIES

Irritant Contact Dermatitis
Irritant contact dermatitis is likely the most common manifestation of cutaneous mask adverse reaction. Strategies should focus on preventing friction and pressure while also maintaining proper device performance. Cleaning the skin daily to remove excess oil and mask residue is important. Gentle skin care, including regular application of moisturisers and/or barrier creams along with targeted therapy for dermatitis, is appropriate. A change of mask brand or style can be considered. Even after the skin has healed, barrier protection should continue.

Allergic Contact Dermatitis
The goal of management for ACD from facial PPE is hapten avoidance. Comprehensive patch testing and repeat open application testing of potential culprit products may be necessary to identify causative agents. Patch testing of facial PPE can be completed by deconstructing the PPE to isolate individual components (layers of mask, nosepiece, earpiece, etc) and then direct application to the skin with a drop of saline and application of tape, followed by standard patch test protocols. If patch testing is not possible, avoidance of potential haptens, gentle skin care, and targeted dermatitis therapy are the best practices. In addition, a change of the brand, style, and/or mask colour can be considered. If there is concern for polypropylene (or formaldehyde) allergy, consider a polyester or poly-cellulose-based mask.

Acne
Facial cleansing should occur at the end of each shift. Sensitive skin types may need to reduce the use of cleansers containing salicylic acid, benzoyl peroxide, and other irritants. Oily skin types may need to wash the face before and after wearing the mask. Gentle skin care and standard targeted therapy for acne are appropriate. A report of N95 respirator–related acne in HCWs identified topical retinoids and systemic antibiotics as useful in 2 patients.

Contact Urticaria
Non-sedating antihistamine therapy should be considered to prevent urticaria. Management may require decreased exposure time to tight-fitting masks or job reassignment if therapeutic measures are unsuccessful.

Limitations
There are many facial PPE manufacturers in the United States. Although the authors of this investigation and paper attempted to reach a representative sample of the US market, the availability of comprehensive manufacturing information and the willingness of manufacturers to provide information limited our analysis. This study did not evaluate face masks made in Asia, which is currently the largest manufacturer of facial PPE in the world.

For more detailed information, please read the original article.

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 Dermatololologic 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

Editor's Note:
In previous editions of The Patch Tester this Website Review section has focussed on the websites of dermatology organisations in various countries. However, for this issue #7 we choose to focus on the pages of two websites, of the BAD and AAD, respectively, that state the position and recommendations of these two societies on the COVID-19 pandemic. Although the BAD information is highly country-specific, for BAD members, there is nevertheless much good and useful information that can be of benefit for dermatologists in other countries.

From the website of the British Association of Dermatologists

COVID-19: Clinical guidelines for the management of dermatology patients remotely

Teledermatology: Advice and Guidance, tele-triage, video consultation and remote working
As hospital services come under increasing pressure and dermatologists are re-deployed to front line services, clinicians need to work differently. Departments will need to rapidly adapt to run significantly reduced services to support dermatology care, both in the short and long term. The focus is to reduce patient travel to GP and Provider organisations, while maintaining continuity of care.
This guidance should be used to help dermatology units maintain urgent services, optimise use of medical staff, minimise additional work for GPs, and provide continuity of care with virtual patient management where possible. Dermatologists will need to comply with their own commissioners and organisations guidance in this unprecedented situation; this document aims to provide guidance and share good practice.

Key principles:

1. Streamline skin cancer patients on 2WW (Two Week Wait) pathways, using telederm-atology to triage referrals and book patients directly to surgery where possible
2. Manage urgent / on-call patients and in-patient referrals using secure nhs.net email or mobile messaging apps where possible
3. Redirect new patients through Advice and Guidance services where possible rather than referral
4. Manage referred patients by switching face-to-face clinics to teleconsultation +/- video consultation where possible (new and follow-up)
5. Optimise remote access to allow dermatology staff to continue to provide patient care from home if required
6. Facilitate virtual staff team meetings to coordinate patient care
7. Establish patient consent policies for receiving reviewing and storing patient images from health care professionals and patients.

Further information about these key principles is detailed below.
1. 2-week wait patients

Ensure that booking slots and clinic templates are adjusted to protect 2WW and urgent slots. Consider changing directly bookable 2WW services to Referral Assessment Services (RAS) with images attached, to optimise triage +/- directly book patients to skin surgery. If teledermatology is used for 2WW triage, then patients should ideally have their skin lesions photographed by a GP with dermoscopic training or by appointment with a medical photographer. Patient images are unlikely to be adequate for suspected melanoma / pigmented lesion triage, but may allow triage of patients with squamous cell carcinoma direct to surgery. Secure clinical image smartphone apps (e.g., Consultant Connect® and Pando®) can aid clinical image capture in primary care. Triage should ideally be carried out by a dermatology consultant (core member of LSMDT / SSMDT).

2WW triage models are described in Dermatology Outpatient Case Studies December 2019: Using technology to enhance service delivery

2. Urgent / on-call and emergency in-patient consultations

NHSX has produced Information Governance Advice recognising the unprecedented challenges we are all facing during the Coronavirus (COVID-19) pandemic, particularly when there is a need to share information quickly. This advice is endorsed by the Information Commissioner's Office, the National Data Guardian and NHS Digital.

Mobile messaging can be used to communicate with colleagues and patients / service users as needed, including commercial applications such as WhatsApp where there is no practical alternative. Consider what type of information you are sharing and with whom, and as much as possible limit the use of personal / confidential patient information. Commercial medical smartphone apps such as Consultant Con-nect®, Pando® and Hospify® can support sharing of clinical information securely between health care professionals. Departments may set up a central nhs.net e-mail address or use individual nhs.net mail for photographic images transfer between health care professionals.

3. Advice and Guidance

Dermatology departments should encourage GPs to consider Advice and Guidance (A&G) requests, or other established teledermatology pathways, rather than routine referral where possible. Advice and Guidance services can be provided through the NHS e-Referral service (e-RS) or commercial platforms.

See guidance from NHSD: e-RS features that many help organisations during the Coronavirus (COVID-19) situation: Advice and Guidance

Standard NHS Advice and Guidance services involve GP / Consultant communication rather than patient / Consultant communication. However, a number of platforms are already in use in primary care which can allow patients to send photographic images to the GP securely (e.g., eConsult® and accuRx®), and these images can be attached to Advice and Guidance requests to reduce patient travel. For patients having images taken in the GP surgery, smartphone apps (e.g., Consultant Connect® and Pando®) can allow easy capture and transfer of images into A&G requests by primary care staff.

Dermatology departments with existing tele-dermatology Advice and Guidance or other tele-dermatology services should work with local GPs / commissioners to mobilise these services rather than referrals where possible. Consider working with regional dermatology departments to temporarily open wider A&G services or cross-cover for colleagues. Support for Dermatology departments who do not currently run an Advice and Guidance teledermatology service is available through the BAD or using the NHS A&G toolkit - NHS e-RS Advice and Guidance Toolkit.

Although A&G usually involves direct GP and Consultant communication, a wider referrer and provider workforce may be appropriate in the response to COVID-19, including non-Consultant grade

doctors and specialist nurses, in order to free up senior front-line staff for acute care.

4. Managing routine referrals

Patients should be offered the opportunity for a telephone or video-consultation at their previously allocated face-to-face appointment timeslot if possible. Trusts may already have an established video-conferencing solution such as NHS Attend Anywhere® or accuRx®.

COVID-19 Information Governance Advice encourages the use of video-conferencing to carry out consultations with patients and service users to reduce the spread of COVID 19, using video-conferencing tools such as Skype, WhatsApp, Facetime, as well as commercial products designed specifically for this purpose. The consent of the patient or service user is implied by them accepting the invite and entering the consultation. Safeguard personal / confidential patient information in the same way you would with any other consultation.

Departments may choose to set up a central nhs.net email for photographic images to be sent through for review by the consultant to assist tele-consultation. Patients should be advised that e-mails sent from personal email addresses to nhs.net are not guaranteed to be encrypted. Voice recognition software (e.g., M-modal®) is available in some Trusts to support clinic letter documentation.

Routine dermatology referrals are likely to decrease during the coronavirus pandemic; referred patients will continue to be added to provider waiting lists, with uncertainty as to when they can be seen. NHS Digital has produced advice on managing routine referrals, monitoring provider worklists and managing cancellations - e-RS features that many help organisations during the Coronavirus (COVID-19) situation.

5. Providing patient care from home

Members of staff may be away from their usual place of work and isolating for different reasons. Many dermatologists will already have hospital laptops with Virtual Private Network (VPN) access to hospital systems from home. Hardware requests for laptops and issuing of VPN licences is being accelerated in many hospitals – please discuss with your hospital Chief Clinical Information Officer, service manager and IT teams.

Hospital-approved laptops with VPN and smartcard access can allow dermatologists working from home to provide;

- Electronic Advice and Guidance to GPs
- Tele-triage of GP referrals
- Telephone consultations with access to electronic patient records and blood results

Commercial platforms used through NHS contracts enable users to work on non-NHS equipment from home within Virtual Private Networks.

6. Virtual staff team meetings

NHS mail, Zoom®, Microsoft Teams® or Cisco WebEx® are widely used platforms to maintain team communication throughout the COVID-19 pandemic.

7. Patient consent

Photographic consent policies should be discussed with your health care organisation information governance and medical photography teams, as policies may vary across organisations. The following guidance relates to COVID. Consent is required for patient images to be used for patient care, including diagnosis or triage. The consent process;

- informs the patient that there may be a difference between the accuracy of clinical care using photographs as compared to face-to-face clinical assessment
- explains how the images will be used, transmitted and stored in the health care organisation
- obtains wider consent for teaching / publication / research if relevant

Written consent is recommended (see specimen consent forms)

UK guidance on the use of mobile photographic devices in dermatology.

However, where planned face-to-face consultations have been changed to non-face-to-face consultations then written patient consent may not be possible or practical. Where verbal consent only is given, the healthcare professional should document this, and consent would not extend beyond direct provision of care.

When patients capture and transfer their own images – specific considerations

Patient images are usually sent to Dermatologists from GPs, via secure transfer (e.g., using e-RS or other approved platforms). During the COVID-pandemic, many new temporary pathways for transfer of patient images to dermatology departments have been established, including direct transfer of images from patients using generic e-mail services or mobile messaging. These images are often used to support telephone consultations, in a similar way to video-consultation but using ‘still’ images.

- If a clinician requests that the patient sends images, patients need to understand that there are the usual risks associated with sending any images via the internet. This constitutes a non-secure transfer and images are not subject to information governance and data protection until they have been received by the healthcare professional. Likewise, any images patients take and hold on their own phones may not be secure.

- Once the image has been received by a healthcare professional, any onward data transfer and storage should meet the NHS data protection and information governance requirements of the health care organisation.

- If a clinician requests that the patient sends images, the routine documented consent process should be undertaken verbally and documented with a message explaining consent (e.g., ‘by sending these images you consent to them being held in your medical record’) or by sending a written patient consent form for the patient to complete and return.

- Where images are suitable for teaching, consent forms can be sent to patients electronically and either completed electronically (e.g., with e-signature) or patients can return a photograph of the completed printed form.

- For temporary COVID-19 generic email addresses it is advisable to set up an autoreply which can relay important information to patients, highlighting that the mailbox is not monitored actively and that the photos are sent on the understanding that the process is not secure. Mailbox capacity can quickly fill up; we recommend liaising with your medical photography team to ensure photographs can be moved into a shared access point in your organisation where they can be accessed by other health care professionals as required.

- The BAD are aware that in the context of COVID-19 some dermatologists are deleting e-mailed patient images following the virtual consultation and managing patient images as a 'still' form of video-consultation (where no data is stored e.g., NHS Attend Anywhere). Images are deleted based on clinical judgement, with documentation of verbal consent, and patients are advised to retain the images. This option is being used where there are significant resource barriers for clinicians +/- medical photographers to archive large volumes of emailed images, (particularly of common conditions such as eczema or acne where images would not normally be taken within a face-to-face consultation) or when patients do not wish to have their images stored in their hospital record. It is recommended that images are retained when they have been used to make clinical judgements on patient care.

The guidance above is intended to support departments manage patients in whom image transfer has not involved their GP, particularly patients referred prior to COVID-19 lockdown.

As part of COVID-19 recovery it is recommended that departments develop or reinstate secure long-term pathways for new patients, involving either image capture in the GP surgery or secure image transfer between patient and GP (e.g., eConsult® and accuRx®) with written consent attached, followed by secure transfer to dermatology departments using A&G or e-RS referral pathways, where images are automatical-ly stored in approved NHS systems.

Further information
BAD teledermatology
BAD Clinical Services Unit

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From the website of the American Academy of Dermatology Association

COVID-19: Guidance for dermatology patients for remote consultations

Running your practice safely during the ongoing COVID-19 pandemic
With the current COVID-19 pandemic, many dermatology practices are operating differently. These recommendations should help you keep your practice operating safely during the pandemic. Based on the CDC definition of COVID-19 risk exposure, most dermatology practices fit into the low-risk category.

Step 1: Understanding your community's rate of COVID-19 prevalence
Communities with greater prevalence will require more stringent procedures, while those with a lower incidence of COVID-19 may function in a different manner.

1. The federal government has stated that a downward trajectory of documented cases over a 14-day period should occur before opening practices to elective visits and procedures. However, most states have "opened" to various degrees in spite of rising case numbers, allowing elective visits and procedures to proceed.

2. Consult with your local and state public health department for local requirements. The AMA has developed a helpful chart summarizing each state's directives on elective, non-urgent, or non-essential procedures. The situation is changing with some regularity as "hotspots" crop up around the country.

3. Have a plan in place for patients who appear with COVID-19 symptoms and may need testing. Consider finding testing locations in your area where you can recommend patients can go for testing or refer the patient to their primary care physician. Consult the CDC's guidance on Covid-19 testing.

Step 2: Clean your practice
It is important to properly prepare your clinic space to ensure you, your staff, and patients continue to remain healthy and safe while practicing.

1. Clean and disinfect your entire practice according to World Health Organization (WHO) standards:

   a) 70% ethyl alcohol to disinfect small areas between uses, such as reusable dedicated equipment (for example, thermometers); OR

   b) Sodium hypochlorite at 0.5% (equivalent to 5000 ppm) for disinfecting surfaces; OR

   c) Any disinfectant products that meet the EPA's criteria for use against SARS-CoV-2.

   d) If your practice has been closed for more than seven days, you can perform your normal routine cleaning procedures as the virus that causes Covid-19 has not been shown to survive on surfaces longer than this time, according to the CDC.

2. Using the WHO recommended standards above, wipe exam tabletops, countertops, exam beds/tables, doorknobs, and exam light buttons/handles between each patient during the clinic day.

3. Using the WHO recommended standards, wipe all common high-touch areas at the end of the day, including but not limited to:

   a) Exam room: exam tabletops, countertops, exam beds/tables, doorknobs, and exam light buttons/handles, chairs, and faucet handles.

   b) Bathroom: all bathroom surfaces, urine-sample pass through areas / trays, and toilets.

   c) Reception: all countertop surfaces and chairs.

   d) Offices: all surfaces and chairs.

   e) Lab, kitchen, and break room: all surfaces and countertops.

   f) Empty all trash cans.

Step 3: Reorganize your practice to minimize patient contact and increase sterilization

1. Put up signs to notify patients of COVID-related precautions and add markings where necessary to maintain appropriate social distance (e.g., tape marking in front of reception for patients to maintain distance from staff and each other). Use the Academy's sign template.

2. Reduce the number of chairs in waiting rooms and appropriately space them apart.

3. Remove magazines and other reading materials from patient care areas.

4. If pens are required for patients to fill out forms, clean them between each patient (use one penholder for clean pens and another for used pens).

5. Place additional hand sanitizers and wipes in the waiting room for patients as well as in high-traffic areas for staff.

6. Have hand sanitizer and/or a place to wash hands with soap and water in each exam room.

7. Consider keeping all doors open on the patient path from the entrance through the office to the exit, to minimize the need to touch surfaces.

8. Determine if physical barriers would be helpful to protect staff from patients exposed to COVID-19. For example, is there a sneeze-guard that could be installed to limit contact between front-desk staff and patients?

9. Limit visitors to essential vendors and suppliers. Consider having virtual meetings whenever possible, such as with pharmaceutical reps.

10. For Mohs surgery, have the patient stay in their assigned room through all stages and repair. They should only leave the room for restroom breaks. Snacks can be brought to the patient in the room as needed.

11. COVID-19 transmission has not been documented through blood or tissue fluid. Therefore, for ablative laser procedures, no change is needed in current practice. Specifically, continue wearing the same type of personally protective equipment (PPE) as before the COVID-19 pandemic and using smoke evacuators to protect the operator and assistants from blood-borne and tissue pathogens and carcinogens in the laser plume. Similarly, for dermabrasion, masks and face-shields are a reasonable measure to protect the operator and assistants from blood-borne pathogens.

12. Implement digital tools to assist your practice in maximizing social distancing where appropriate:

    a) Connections must be compliant with HIPAA and use web browsers with encrypted communications, such as Chrome, Firefox, or Safari.

    b) If you have an electronic health record (EHR), contact your vendor to determine if there are any applications you can install to reduce in-person contact. Examples include patient portals, online bill pay, electronic orders for staff, electronic prescriptions, and electronic lab orders.

    c) Visit the Academy's Health IT resource center for specific guidance on digital tools to adapt in your practice during this time.

    d) Continue using teledermatology for appropriate patients. It is important to consider that relaxed regulations may revert to pre-national health emergency rules after the emergency is over.

Step 4: Maintain appropriate PPE for staff

1. Check OSHA's PPE standards (29 CFR 1910 Subpart I) and ensure there is enough appropriate PPE for all your staff. The Academy offers a way for members to purchase PPE through the AAD Member Buying Program. Review CDC guidance and some state guidelines on how to optimize the supply of face masks.

2. Masks and eye protection should be worn by all staff interacting with patients and patients should come into the office wearing a mask.

3. Whenever a staff member needs to remove or adjust their PPE, they should first wash their hands with soap and water for 20 seconds or rub them with an alcohol rub. They should then again wash their hands with soap and water for 20 seconds or rub them with an alcohol rub after they have touched and/or adjusted their PPE.

4. Consider the necessity of conserving PPE during the pandemic. The same mask may be worn for several days and either sterilized or put aside for 5-7 days and reused.

Step 5: Set your patient schedule including telemedicine visits

The treating dermatologist should make the decision of which visits should be transitioned to telemedicine and which need to be done in person. Here are some guidelines to help you schedule patients:

1. Consider priority scheduling of patients that were the most urgent during the time the practice was closed or limited to essential services only but could not be seen in person.

2. Continue offering telemedicine (if waivers are still in effect) during downtime in your practice. Use this workflow (PDF download) to help you implement telemedicine in your prac-tice while seeing patients.

3. Minimize in-person follow-up visits by using absorbable or buried sutures for surgical procedures. Consider doing teledermatology follow-up visits whenever practical.

4. If you don't offer online appointments, consider enrolling in an online platform so patients can schedule appointments in an easier manner and staff aren't overwhelmed with phone calls from the pent-up demand.

5. Let patients know of the steps your practice is taking to keep them safe at the office in your communications with them.

6. Consider making your cancellation policy more flexible as patients may fear visiting practices during this time.

Step 6: Organize your staff

Follow CDC updates and check with your state and local public health departments on regulations concerning group gatherings. Try to limit the number of staff per room in your practice and consider the following guidance:

1. Educate staff on social distancing in break rooms or lunch areas so they sit at least six feet apart. Staff should wear PPE for office staff meetings or sit at least 6 feet apart.

2. Instruct staff not to share workstations or computers. If equipment must be shared, staff should be trained on properly cleaning between each use.

3. Practice social distancing with patients. Train staff to greet patients with a nod, smile, and/or wave. Do not shake hands or hug.

4. Tell staff not to come into the practice if they exhibit any flu-like illness, loss of taste or smell, other known COVID-19 symptoms, or if they have been in close contact with a COVID-19 infected individual. Staff should follow the CDC's Return to Work Criteria.

5. Screen staff each day prior to seeing patients for the presence of flu-like symptoms (cough, fever, sore throat, runny nose, nausea, diarrhea, or shortness of breath), loss of taste or smell, or close contact with individuals who may be infected with COVID-19. Consider non-contact temperature screening (the CDC defines 100.0+ degree F as fever). If the screen is positive, consistent with possible COVID-19 infection, or there was close contact with an infected individual, the staff member should be sent home and instructed to follow the CDC's Return to Work Criteria.

6. Summary of the CDC's Return to Work Criteria.

a) Except for rare situations, in symptomatic staff, a test-based strategy is not recommended to determine when staff should return to work.

b) The CDC defines health care worker close contact as being within about 6 feet of an infected person for a total of 15 minutes or more while not wearing recommended PPE. If staff wear PPE throughout the workday and socially distance at other times, they would not be considered at high risk of exposing their co-workers / patients or of being exposed to COVID-19 by them.

c) Staff with mild to moderate symptoms should not go to work and should self-isolate for 10 days from symptom onset and at least 24 hours fever-free without fever-reducing medication with other symptoms improved. Staff who were suspected of having COVID- 19 and had it ruled out based on a clinical decision that COVID-19 is not suspected and testing is not indicated should be able to return to work (without other suspected or con-firmed diagnoses).

d) If a physician evaluating a symptomatic staff member for COVID-19 decides that antigen testing is indicated and the test is negative, that would indicate that the staff member likely did not have active COVID-19 infection at the time the sample was collected. A second antigen test may be performed at the discretion of the evaluating physician, particularly when a higher level of clinical suspicion for COVID-19 infection exists. Staff who were suspected of having COVID-19 and had it ruled out with at least one negative test should be able to return to work (without other suspected or confirmed diagnoses).

e) Staff with severe or critical illness should not go to work and should isolate for 20 days from symptom onset and at least 24 hours fever-free without fever-reducing medication with other symptoms improved.

f) A staff member that has been exposed to a COVID-19 infected individual, should either not go to work and self-quarantine for 10 days or have a COVID-19 test done at 5-7 days after exposure and not go to work and self-quarantine until the result is known. If negative, they can return to work 7 days after exposure. If positive they should not go to work and self-quarantine for 10 days from the date of the test. If symptoms develop, follow the symptomatic healthcare worker algorithm above. If the staff member previously had COVID-19 within the past three months and remains without symptoms they do not need to quarantine and should not have a COVID-19 test done.

g) Asymptomatic staff without known exposure who decided to get a COVID-19 test and the test came back as positive should not go to work and should self-quarantine for 14 days. If symptoms develop, follow the symptomatic health care worker algorithm above.

h) Check with your local and state health department for any additional requirements for management of staff that are suspected of having COVID-19.

7. The CDC has created guidance regarding how to handle health care personnel who may have been exposed to COVID-19.

The AAD has also assembled information about the status of risks to personnel in health care facilities (PDF download) and will be updating it frequently.

OSHA has also provided guidance on how to keep practices safe during a pandemic (PDF download).

8. If findings suggest the possibility of COVID-19 infection, consider referring staff to their * primary care physician or local urgent care center for evaluation.

9. Follow HIPAA protocols if staff are diagnosed with COVID-19. You may inform patients and staff they have encountered someone who has tested positive for COVID-19; however, you cannot identify the staff without their consent.

10. Be flexible and accommodating with staff whenever possible. Childcare and schooling op-tions may be limited during this time.

11. Make sure you communicate all new procedures with staff in advance of any changes / updates to your office procedures.

12. Check with your state's requirements on employee travel. Some state and local governments require people who have recently travelled to certain high COVID-19 prevalence areas to quarantine for 14 days.

13. Understand the employment-related legal considerations during the pandemic by reviewing the following Dermatology World articles:

a) Employment-related legal considerations during the COVID-19 public health crisis
b) Employment-related legal considerations during COVID-19, Part II
c) COVID-19 impact on employed dermatologists: Part 1
d) COVID-19 impact on employed dermatologists: Part 2

Step 7: Patient screening

1. Prior to arrival for an appointment or on the day before the appointment, check with the patient if they have developed any symptoms of a respiratory infection (e.g., cough, sore throat, fever, runny nose, or shortness of breath), diarrhea, nausea, or loss of taste or smell. Additionally, ask the patient if they have had any recent close contacts with others either diagnosed with or exposed to COVID-19.

   Consider using a screening tool. If COVID-19 is suspected, refer the patient to their primary care physician for evaluation and re-schedule their appointment to a later date. If a primary care physician is unavailable, refer the patient to an urgent care center.

   It may be prudent to receive written clearance from the treating physician as to when the patient can be seen in your practice and is clear of COVID-19 symptoms.

   Contact your malpractice carrier to consult on COVID-19 related care including expectations on patient pre-screening.

2. Instruct the patient to come to your practice alone unless they need a caregiver (or parent for children) with them at the visit. If unable to arrive alone, suggest the individual accompanying the patient wait in the car or outside the office for the duration of the appointment. Also, advise the patient that face masks are now highly recommended by the CDC for all persons, except for young children under age 2, anyone who has trouble breathing, or unable to remove the mask without assistance when they go out in public. Due to additional screening activities, allow extra time upon arrival.

3. Once the patient arrives, consider having them wait in their car or outside the office until called or texted on their cellphone. Ask about the presence of flu-like symptoms (cough, fever, sore throat, or shortness of breath), loss of taste or smell, and / or contact with potentially infected persons. Consider non-contact temperature screening (the CDC defines 100.0+ degrees F as fever). If findings suggest possibility of COVID-19 infection, refer the patient to their primary care physician or local urgent care center for evaluation and re-schedule their appointment to a later date. Screen any accompanying individuals who visit the practice as well.

4. Consider creating as much of a paperless check-in process as you can. Ask the patient to complete all their required pre-visit paperwork online through your patient portal, or securely email forms in advance.

5. Practice social distancing when you greet patients and staff with a nod, smile, and/or wave. Do not shake hands or hug.

6. Determine if any procedures being done that day will require additional PPE such as ablative laser procedures or dermabrasion. Most dermatologic procedures are NOT believed to generate aerosols or droplets.

7. Some states may restrict procedures requiring PPE, so you may need to assess with your state public health agency as to which procedures are permitted during the pandemic. For example, cryotherapy is considered a procedure but does not deplete PPE.

8. Some hospitals and ambulatory surgery centers require COVID-19 testing (antigen) of patients undergoing procedures in those facilities. If you operate in such an environment, follow the requirements. Patients undergoing such preoperative testing must quarantine between the time they get the test and admission to the facility.

9. Despite screening patients, all patients should be treated as potentially being infectious with COVID-19. Patients known or suspected to have COVID-19 that need treatment for a dermatologic condition related to or exacerbated by COVID-19 should be seen by tele-medicine whenever appropriate. If an in-person visit is required, all safety precautions in the office should be followed carefully. In addition, the patient should interact with only one dedicated staff member plus the physician. They should stay in one exam room throughout the encounter, with the door closed. After the encounter, thoroughly disinfect all surfaces.

Step 8: Keep communicating with patients

1. Inform patients of the steps your practice is taking to prevent COVID-19 infections through social media, your practice website, and other marketing channels. See the Academy's sample scripts (PDF download).

2. Try different patient schedules to maximize social distancing. Consider extending office hours to keep patient visits from overlapping with each other.

3. Consider gathering patient preferences for communication channels (e.g., text, email) so they can stay informed of your practice's changes through the pandemic.

4. Be prepared to take any necessary steps if there is a resurgence of cases in your community or clinic once you have reopened. Keep communication channels with patients open so you can inform them of any changes.

For full information, please read the original relevant pages on the AAD website.

Contact Dermatitis / Patch Testing

1st to 3rd September 2021
European Society for Contact Dermatitis
Amsterdam, Netherlands
www.escd2021.com

8th to 10th June 2022
European Society for Contact Dermatitis
Amsterdam, Netherlands
www.escd2022.com

Dermatology - International

21st to 22nd June 2021
22nd World dermatology Congress
Tokyo, Japan
https://www.clocate.com/conference/world-dermatology-congress/65366/

15th to 18th September 2021
Ibero-Latin American Congress of Dermatology 2021 (CILAD)
Madrid, Spain
www.cilad2021.org

22nd to 25th September 2021
14th World Congress of Paediatric Dermatology
Edinburgh, Scotland
www.wcpd2021.com

22nd to 25th September 2021
European Society for Dermatological Research
Virtual Meeting
www.esdrmeeting.org

29th September to 2ND October 2021
EADV Congress
Vienna, Austria
https://eadv.org/calendar/show/60

3rd to 6th November 2021
18th World Congress of Cancers of the Skin
Buenos Aires, Argentina
www.cilad.org/wccs/

10th to 13th November 2021
International Congress of Dermatology
Virtual Meeting
www.icd2021.com.au

The COVID-19 pandemic has caused the postponement or cancellation or change of format for all congresses originally scheduled for the latter part of 2020 and well into 2021. Check the society and congress websites frequently for updated information.