Hand dermatitis affects up to one in three healthcare workers, and can be caused by contact with materials and chemicals used in dentistry. Dental workers are particularly at risk because of continuous glove use and frequent washing of hands. This Fact File describes three recognised types of hand dermatitis, including latex allergy, their causes and how to manage them.

What is hand dermatitis?
Hand dermatitis is a general term describing three different skin reactions:

* irritation;
* delayed (type IV) hypersensitivity;
* immediate (type I) hypersensitivity.

Their causes and characteristics are described in Table 1 (see p. 2):

How common is hand dermatitis?
Irritant contact dermatitis is by far the most common reaction. Of the allergic reactions, delayed hypersensitivity is more common than immediate, although immediate hypersensitivity is potentially much more serious. Because allergies are preceded by a period of sensitisation, ranging from a few minutes to many years, anyone is at risk, at any time in their career. About one person in 10 coming into regular contact with latex gloves may develop sensitivity to latex proteins.

What can cause hand irritation?
At work, irritation can be caused or made worse by:

* chemicals / abrasives in handwashes;
* poor-quality gloves with high allergen levels;
* friction from glove powder;
* frequent washing / drying of hands;
* inadequate drying of hands;
* ill-fitting gloves;
* excessive sweating and bacterial proliferation under gloves.

Outside work, problems can arise from:

* contact with household detergents / cleaners / other chemicals (concentrated ones especially);
* failing to protect hands when gardening, working on motor vehicles or similar activities;
* cold weather and wind chapping.

What can cause allergy?
At work, allergies are commonly due to:

* chemicals in latex and non-latex gloves (mainly the accelerators – see Table 2 on p. 3);
* chemicals in handwashes;
* natural rubber latex proteins.

The likelihood of something causing an allergy depends on its allergenic potential, its concentration, an individual’s predisposition to developing allergies and previous levels of exposure.

Generally, the higher the allergen levels, the higher the risk. Sensitisation can be brought on by repeated contact with high levels of an allergen but, once allergic, someone may experience reactions at much lower levels. Also, an already irritated and inflamed skin may be more susceptible to penetration by allergens if the skin’s natural barrier is compromised.

Why do gloves used in dentistry cause problems?
Latex is used in the manufacture of most gloves because it still provides the best protective barrier against micro-organisms (especially viruses), whilst allowing freedom of movement and tactile sensitivity. After manufacture there may be detectable levels of extractable latex proteins and other residual chemicals which can cause allergy. Latex proteins cause immediate hypersensitivity reactions, whilst chemicals cause delayed hypersensitivity reactions.
### Causes and characteristics of different types of hand dermatitis seen in dental workers

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<tr>
<th>Skin Reaction</th>
<th>Common name</th>
<th>Cause</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td>Irritation</td>
<td>Irritant (or non-specific) contact dermatitis</td>
<td>Skin damage from direct contact with chemical irritants (commonly in hand-washes and gloves). Worsened by physical irritation (commonly glove powder and frequent washing / drying) and by inadequate drying.</td>
<td>Redness (erythema), dryness and chapping of skin. Usually reversible but chronic if the cause is not removed. In some cases, irritation may progress to hypersensitivity, so the problem should not be ignored. Can look similar to allergic contact dermatitis (see below) if fissures and vesicles develop.</td>
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<tr>
<td>Delayed (type IV) hypersensitivity</td>
<td>Allergic contact dermatitis</td>
<td>A T-lymphocyte mediated reaction. Commonly caused by chemicals (for instance chemical residues in latex and non-latex gloves following manufacture, and also chemicals in handwashes).</td>
<td>Begins as a red rash on the back of the hands, reaching its maximum extent up to 48 hours after contact. Subsides if the allergen is removed. Skin temperature is raised sometimes, and skin may become fissured and develop blisters (fluid-filled vesicles). Long-term exposure to an allergen causes skin to thicken and become leathery. The reaction can extend beyond the hands if the cause is not removed.</td>
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<tr>
<td>Immediate (type I) hypersensitivity</td>
<td>Contact urticaria</td>
<td>An immunoglobulin E (Ig E) response. Commonly caused by natural rubber latex proteins in gloves.</td>
<td>Occurs quickly, within 30 minutes of exposure. Symptoms are: localised or generalised redness and itching (urticaria); and swelling (oedema). If mucous membranes are affected, rhinitis, conjunctivitis and asthma may result. Generalised hives, respiratory distress and low blood pressure (anaphylaxis) can also occur within minutes of exposure and can be fatal. (To check how to deal with anaphylaxis in the dental surgery, refer to the current Dental Practitioners’ Formulary.)²</td>
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Table 2

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<th>Chemicals added to latex and non-latex gloves causing delayed hypersensitivity reactions</th>
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<tr>
<td><strong>Accelerators</strong> (to give strength and elasticity). Examples are mercaptobenzothiazoles, thiurams (for instance tetramethyl thiuram disulfide), carbamates (for instance zinc diethyl dithiocarbamate) and guanidines.</td>
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<tr>
<td><strong>Antioxidants</strong> (to prolong the life of gloves). Examples are amine and phenolic compounds.</td>
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</table>

**Why is glove powder a problem?**
The addition of cornstarch powder to latex gloves increases the risk of developing immediate hypersensitivity to latex. Powder acts as a carrier for latex proteins which, when air-borne, can reach the mucous membranes of the eyes and respiratory tract – thus increasing exposure to latex allergens. Powder itself may cause physical irritation, but allergy to it is extremely rare.

**Who is at risk of developing latex allergy?**
Allergy to latex is more common in those who have a history of:

- frequent, prolonged and intimate contact with latex devices (for instance gloves);
- general predisposition to allergies (known as atopic individuals);
- pre-existing skin conditions (for instance eczema);
- multiple surgical procedures (abdominal / urinary tract especially) where exposure to latex medical devices is frequent;
- Spina Bifida – all these patients should be assumed allergic to latex, due to the numerous operations which are needed to treat abnormalities during infancy;
- food allergies (fruits such as banana, avocado, chestnuts, kiwi fruit, peach, pineapple and papaya have similar protein structures to latex, and so the risk of developing a sensitivity to latex is increased).

**How is the risk of developing hand dermatitis minimised?**
Look after your hands as much as possible. Good hand-care is important for everyone, whether or not problems have developed. Remember, dermatitis can develop at any stage in your career. Exposure to potential irritants / allergens must be minimised and avoided where possible. Cuts and abrasions must be covered before putting on gloves, in order to reduce the risk of cross-infection and minimise skin penetration by irritants / allergens. Hands confined in gloves for long periods create a warm, moist environment – good for microbial proliferation. Some skin bacteria are pathogenic, and all may irritate the skin.

Here are some tips on hand care:
- don’t wear jewellery (for instance rings) during work, since this can encourage the build up of irritants;
- wash and disinfect hands at the beginning and end of each session, as well as between each glove change;
- use cool / tepid water when washing, to keep hand temperature down;
- use handwash agents sparingly;
- rinse thoroughly to remove all traces of handwash;
- pat skin dry rather than rubbing it;
- use soft towels (disposable);
- ensure hands are dry before putting on gloves;
- use non-powdered gloves with low levels of low molecular weight latex proteins and residual chemicals (ask the manufacturer for information if it is not supplied. Low protein is currently defined as less that 50 micrograms per gram);
- choose the right size of gloves;
- minimise contact with other potential irritants / allergens in the surgery (for instance acrylic monomers / powders, or anti-microbial and pharmacological solutions);
- outside work, don’t forget to protect hands when gardening, doing household chores and when working with motor oils, strong chemicals or detergents.

**Do handcreams help?**
Handcreams help preserve skin’s elasticity and reduce dryness, making it less susceptible to irritation. Use a bland, emollient moisturiser. At work, avoid petroleum-based creams which may reduce the protective properties of gloves. “Barrier creams” can contain irritants or potential allergens, and may increase penetration of glove allergens into the skin. Ask your pharmacist for help when choosing.

**What should I do if I suspect hand dermatitis or latex allergy?**
The key message here is that if you have a problem, don’t leave it – seek medical advice from your medical practitioner, local occupational health expert or dermatologist. This is particularly important if you think you may have become sensitised to latex. Latex allergy can be potentially life-threatening and expert advice must be sought immediately.

**What treatment is available?**
Management usually depends on the cause and severity, and medical advice is required to confirm a diagnosis and decide the best way to manage the problem. Various tests can be used to determine whether dermatitis is allergy-based. Failure to identify an allergen may then mean looking at potential skin irritants for the cause.

Management of many cases of hand dermatitis simply involves minimising exposure to potential irritants / allergens and aiming for prevention. It is important to maintain a positive approach. Make sure you are meticulous in your skin-care routines (both at work and at home) and try different combinations of gloves, handwash agents and handcreams to control the problem.

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Creams and tablets may be prescribed. Corticosteroid creams are usually very effective, though prolonged use may thin the skin, and their use should be medically supervised. Sometimes it might be necessary to stop work for a while to give hands time to heal properly.

**Can dental workers with latex allergy continue to practice?**
It may be possible to continue working in a clinical environment, although the individual’s level of reactivity will ultimately decide whether or not it is feasible. Guidance must be sought from an appropriate medical expert.
Some manufacturers provide non-latex gloves made of synthetic elastomers for people allergic to latex. Vinyl gloves do not guarantee protection against viral particles and may not be an appropriate choice. Other people in the workplace can help reduce levels of air-borne latex proteins by using powder-free gloves with the lowest levels of latex proteins, available from reputable manufacturers. The latex content of other work items, for instance rubber dam, must be determined (from the manufacturer) and contact with them avoided as much as possible. Non-latex and latex items (including gloves) must be stored separately. Also, everyone in the practice must be aware of the initial signs and symptoms of allergic reactions and look out for them (see the current Dental Practitioners’ Formulary).2

It is important that a risk assessment be carried out for individual patients or members of staff, rather than a blanket approach that assumes that all are affected to the same degree.

Where can I get extra support?
If your condition forces you to take time off work, or even give up altogether, you may want to talk to someone about your experiences. Groups such as the Latex Allergy Support Group (see below for details) offer practical advice and emotional support to health-care professionals and members of the public. Stress can exacerbate skin problems, and hand dermatitis is itself stressful. A vicious cycle of “stress inducing stress” can sometimes occur, and practising relaxation techniques may be helpful.

What precautions are needed for patients with latex allergy?
When taking a medical history, ask specifically about latex allergy to help identify these patients.

If a patient believes they are latex allergic, they should be referred to a medical expert for appropriate testing and advice. Warning signs of latex allergy include reactions to rubber household gloves / plasters / condoms, and also when blowing up balloons. Some individuals develop latex allergy more commonly than most (see list in previous section).

All contact with natural rubber latex during dental treatment must be avoided for patients with latex allergy. Possible sources of latex in the dental practice include gloves, prophylaxis cups, dental dams, orthodontic elastics, tubing on equipment and seals in local anaesthetic cartridges and vials of IV drugs. Latex-free alternatives are becomingly increasingly available, although their selection and use must be considered carefully. Dental staff must wash their hands to remove latex residues before putting on latex-free gloves or handling latex-free items.

Dentists treating latex-allergic patients must ensure they have latex-free emergency drugs and resuscitation equipment available (stored separately from items containing latex). The dental team must be competent to deal with anaphylaxis or collapse should it occur (see the current Dental Practitioners’ Formulary).2 Treat latex allergic patients at the start of the day when latex allergen levels from treating other patients are lowest. For patients not allergic to latex, routinely using powder-free latex gloves helps reduce latex protein levels in the surgery environment.

Further reading
Literature on this subject can be borrowed by BDA members from:

BDA Information Centre
64 Wimpole Street
London
WIG 8YS

(Normal opening hours: 9am to 6pm, Monday to Friday)

Tel.: 020 7563 4545
Fax: 020 7935 6492
E-mail: infocentre@bda.org

British Association of Dermatologists website
http://www.bad.org.uk/public/leaflets/bad_patient_information_gateway_leaflets/latex/

Latex allergies – educational toolkit for healthcare workers (Health and Safety Executive)

http://www.hse.gov.uk/latex/index.htm

Guidelines issued by Royal College of Physicians and NHSPlus


FGDP(UK) Good Practice Guidelines
Guidance for the Management of Natural Rubber Latex Allergy in Dental Patients and Dental Healthcare Workers. Available from FGDP Tel 020 7869 6754

Relevant organisation
The Latex Allergy Support Group
PO Box 27
Filey
North Yorkshire
YO14 9YH

Website: http://www.lasg.co.uk
E-mail: latexallergyfree@hotmail.com

Telephone helpline: 07071 225838
(7pm–10pm daily)

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