Latex glove allergy and healthcare workers

Wearing gloves is part of everyday working life for all nurses.

Natural rubber latex (NRL) gloves are nearly always provided by health care providers as a cheap and effective way of preventing transmission of infectious agents between nurses and patients. However, the use of NRL products can lead to the development of latex allergy in both nurses and patients.

The term 'latex allergy' refers to a Type 1 immediate hypersensitivity response. It can result in lost work time, the necessity to modify an individual's job and even a change in career and lifestyle.

Since the introduction of universal precautions (now called standard precautions) in the mid 1980's, there has been an increase in demand for production of latex gloves. To meet these demands, the quality of glove produced has decreased, meaning that the lower quality gloves often contain higher amounts of protein, which increase sensitization to latex.

What is Type 1 latex allergy?
Latex allergy is caused by the proteins in the sap from the rubber tree, Hevea Brasiliensis. Latex allergy can develop as a result of exposure to NRL, through skin or mucous membranes, or via the respiratory system.

Some people who are allergic to latex also develop allergies to foods which contain similar proteins, such as avocado, banana and kiwi fruit.

Type I latex allergy that develops from skin contact is referred to as 'contact urticaria.' Individuals may use latex for many years without problems before 'Contact Urticaria Syndrome' develops. This syndrome may also include conjunctivitis, rhinitis, asthma, and gastro-intestinal side effects such as nausea, or even anaphylaxis.

Latex is contained in many rubber medical and household products, but is most commonly found in disposable gloves. See table below with examples of products found at work and at home that may contain latex.

Products which may contain Natural Rubber Latex	
Medical products	**Household products**
Catheters	Condoms
Blood pressure cuffs	Rubber dishwashing gloves
Masks	Electrical cords
Elastic bandages	Computer mouse pads
Endotracheal and nasogastric tubes	Rubber bands
Adhesive tapes	Balloons
IV tubing	Rubber grips e.g., on mops, tennis racquets
Ultrasound probe covers	Swimming goggles
Gloves – latex	Rubber shoe innersoles

Rates of latex allergy

Data collected from the Occupational Dermatology Research Centre, Skin and Cancer Foundation, Melbourne; suggest latex allergy reflects a rate of approximately 12% in the nurses seen at the centre, which is similar to rates reported internationally.

Symptoms of Type 1 latex allergy

Symptoms usually occur within 30 minutes of contact with NRL and may include:

- A red, itchy, swollen rash that usually settles within hours. However, it may persist and dermatitis may develop;
- Hives;
- Red and irritated eyes (conjunctivitis);
- Sneezing and a runny nose (rhinitis);
- Shortness of breath, which may progress to asthma.

Respiratory symptoms of latex allergy may be mistaken for hay fever, asthma or even a cold. It is thought that respiratory symptoms develop after the release of latex proteins into the air and their subsequent inhalation. Similarly, gastro-intestinal side effects have been thought to relate to the ingestion of latex particles.

Anaphylaxis

Fortunately, anaphylaxis caused by latex is rare. Symptoms may include swelling of the airways, heart palpitations, dizziness and hypotension. Without immediate treatment, this may result in unconsciousness or even death.

It is thought that latex proteins from gloves can also be transferred to food. People with Type 1 latex allergy have developed anaphylaxis from eating food prepared by a food handler wearing latex gloves.

For full article see: Nixon R, Lee A. Hazards of use of latex gloves by food handlers (letter). *Med J Aust* 2001; 174:482

Contact dermatitis
In addition to immediate allergy to latex gloves, healthcare workers can also develop an allergy to the ingredients used in the manufacture of these gloves, such as rubber accelerators. This is called allergic contact dermatitis and it is a delayed type (Type IV) of allergy. Irritation (or irritant contact dermatitis) can also occur from heat and sweating from wearing these occlusive gloves and also from the glove power (in the powdered varieties). Sometimes health care workers develop both a Type 1 allergy to latex and a Type IV reaction to the rubber chemicals in their gloves. Nurses may experience ICD as well as ACD.

For more information about contact dermatitis, please refer to the section called "Occupational contact dermatitis and nurses."

Risk factors for latex allergy
There are several risk factors associated with the development of latex allergy:

- Exposure - the frequent use of latex gloves is associated with the development of latex allergy;
- Atopy - a personal or family history of asthma, eczema or hay fever (even eczema occurring as a baby with no skin problems since), raises an individual's susceptibility to becoming allergic to latex;
- A damaged skin barrier, such as with irritant contact dermatitis, has been shown to facilitate sensitisation to latex. Health care workers frequently develop irritant contact dermatitis as a result of exposure to wet work and skin irritants, such as antiseptic skin cleansers;
- Glove powder can increase risk of latex allergy in two ways. It may act as a vector in transferring latex proteins from gloves to skin, facilitating sensitisation. Latex proteins attach to glove powder, and are released into the air when gloves are put on or removed. Inhalation or ingestion of the powder during glove removal can lead to symptoms.
  Glove powder may also increase skin irritation. Therefore non-powdered latex gloves are increasingly being recommended and have been associated with lower rates of latex allergy. But despite the labeling on some glove boxes stating 'hypoallergenic,' gloves labelled in this fashion may be made from natural rubber latex and may be powdered.

Patient risks
In the health care setting, patients are also at risk of developing latex allergy, particularly those who have undergone multiple surgical procedures, have a long-term indwelling catheter, and those with spina bifida. All patients should be asked if they have any latex allergy symptoms.

Diagnosis and treatment
It is important to eliminate allergic reactions as a cause of contact dermatitis. Type 1 latex allergy is diagnosed using a blood test known as a RAST (Radio-Allergo-Sorbent- Test), which measures an antibody directed at the latex proteins. Skin prick testing is also used (however RAST test is preferred if there is a high risk of anaphylaxis). Type IV allergy is diagnosed using patch testing.

There is no known cure for latex allergy. Immunotherapy, such as desensitisation injections is currently not considered to be safe or effective for Type 1 latex allergy.

For Type IV allergic contact dermatitis, there is also no form of desensitisation available. Identification of the allergens and subsequent avoidance is the key.

Glove alternatives

In the past, latex gloves have generally been cheaper and more comfortable than synthetic rubber gloves. However the price for synthetic types has significantly reduced and is similar to latex varieties and comfort has also improved. Even if the price for latex alternatives is still higher, the increased expense of latex glove alternatives can be easily justified if reduced productivity and personal costs associated with latex allergy are considered in expense calculations. The price gap between some of the varieties is reducing, so talk to glove suppliers for price differences.

The table below outlines the risks and benefits of various glove types that can be used in the healthcare setting. It is important to highlight that vinyl gloves may be used as an alternative to latex, and in fact are preferred for food handlers and hairdressers, but they do not provide adequate protection against bodily fluids and are thus not recommended for nurses or other health care workers.

Disposable nitrile gloves are preferred for those either allergic to latex or at high risk of latex allergy.

Neoprene gloves are available for sterile use and are protective against bodily fluids. Alternatives to latex exist for most medical products.

Further information is available from web sites provided by glove manufacturers.

Glove type	Positive	Negatives
Natural Rubber Latex	Cheap More comfortable, better fitting Effective barrier protection to bodily fluids Biodegradable	Latex allergy risk Allergy to rubber accelerators Risk for protein aerosol Powder free more difficult to wear
PVC (poly vinyl chloride)	Cheap Readily available Rarely cause allergies	Not protective against bodily fluids Not as comfortable to wear Tear easily

Nitrile	Some varieties are thiuram free Available powder free Good for latex sensitive nurses and patients Effective barrier protection to bodily fluids Price comparable to latex (previously these were more expensive)	Not as comfortable Not biodegradable Not as readily available
Neoprene/ Polychloroprene	Suitable for those with a latex allergy Accelerator free Effective barrier protection to bodily fluids	More expensive than latex gloves Not biodegradable
Polyurethane	Suitable for those with a latex allergy Effective barrier protection to bodily fluids	Not biodegradable More expensive than latex

Prevention and management

The table below provides strategies to prevent and manage latex allergy in the healthcare setting. It is crucial to remember there is no cure for latex allergy, so prevention is the key.

Strategies to prevent and manage latex allergy
All nurses should be educated about skin care during nursing training, at TAFE and university and upon employment, with regular updates.
All workplaces should develop specific policies regarding the use of latex gloves
Education about glove types and their uses should be provided to all occupational health and safety officers and infection control officers
The introduction of latex allergy questions when taking patients history, specifically relating to signs of latex allergy or food allergy
Patients to be educated to inform all healthcare providers, such as dentists and local doctors about their allergy
Information sheets to be available for healthcare workers and healthcare consumers about latex allergy
Visual signage to be displayed about symptoms of latex allergy in patient waiting rooms, emergency rooms, doctors rooms and staff tea rooms
All medical facilities provide a latex free zone for latex allergic patients such as latex free emergency trolley, rooms and theatres
Powdered NRL gloves should be eliminated from all health care settings
Non-latex gloves should be made readily available to all nurses

Appropriate referral system in place for testing of nurses and patients with possible latex allergy
Display signage above patient's beds and in nursing notes highlighting the allergy. Develop appropriate signage highlighting the allergy but ensuring patient privacy

If you suspect you have latex allergy please see your medical practitioner as soon as possible. Severe cases of latex allergy can be life threatening.

Further information

For further information, contact the Occupational Dermatology Research and Education Centre on (03) 9623 9402, email apalmer@occderm.asn.au or visit www.occderm.asn.au.