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Ward and Department

Natural Rubber Latex Sensitivity

Protocols

Please note:

These protocols are intended for generic guidance purposes only. Managers are responsible for undertaking local risk assessments with respect to latex, and should identify local actions/controls in line with section 7 of the 'Policy for the prevention and Management of NRL Allergy'

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NRL SENSITIVITY PROTOCOL

1. Background Information

Natural Rubber Latex (NRL) allergy is becoming common because of the increased use of natural rubber latex gloves in the 1980's secondary to HIV/AIDS awareness. It occurs in about 1% of the general population.

Natural rubber latex (NRL) comes from the milky sap of the rubber tree known as *Hevea brasiliensis*. The sap contains proteins, preservatives and other chemicals added during the manufacturing process. The natural rubber latex proteins enter the body in different ways, such as via the skin, mucous membranes and lungs, and set up an allergic response which *worsens* on repeat exposure. Natural rubber latex proteins can be detected in the air, particularly if powder has been used on the gloves, so it is safer not to use powdered gloves.

People at risk include, (Kam, Lee and Thompson 1997), children with spina bifida, (who have repeated exposure to natural rubber latex during invasive surgical procedures), and people who are allergic to certain foodstuffs; bananas, avocados, chestnuts, potatoes, papaya and kiwi fruit. These are known as cross-reactive allergens because the protein chains are similar in natural rubber latex and these foods. There is a need to reduce these patients' exposure to natural rubber latex by using latex-free equipment and providing a latex-safe environment. Baumann (1999) also suggests there are select groups who have a higher risk of developing a natural rubber latex allergy. These include: health care workers, those undergoing repeated catheterisation, and those having repeated surgical procedures.

There are two recognised types of sensitivities, Type I and Type IV responses. Type I (IgE mediated reaction) is also known as immediate hypersensitivity and is the 'true' natural rubber latex allergy. This can occur within minutes or hours of being exposed to the natural rubber latex proteins. It is unusual for someone to present for the first time with a Type I reaction. Once people have been exposed, repeat exposure can cause histamine release and a generalised reaction that may include rash, oedema, facial swelling, generalised urticaria, bronchospasm, respiratory distress, rhinitis, conjunctivitis and, in severe cases, anaphylaxis (Burt 1998). Type IV reaction is also known as allergic contact dermatitis and is caused by exposure to chemicals used in natural rubber latex manufacture - it is not a natural rubber latex sensitivity. Type IV is the most common reaction. It is a localised reaction and can present with a red raised palpable area with bumps and cracks. Onset is often delayed 6-48 hours after exposure. A Type IV reaction can increase the risk of a Type I reaction, so all susceptible patients should be treated as at risk of anaphylaxis.
Diagnosis of latex allergy is often based on the history of symptoms related to latex exposure. In vitro testing of skin prick testing may be done by the Immunology department in certain cases but more often than not a patient will need to be managed on a suspected diagnosis.

(Glove protocol. The examination and surgeon's gloves at ………… Trust have been contracted for. Advice on which gloves to purchase can be obtained from …………...)

Hypoallergenic DOES NOT mean NRLfree.

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2. Identification of high risk groups

G1 History of anaphylaxis to natural rubber latex or positive skin prick test to latex (Type I)
G2 History of allergy/sensitivity to natural rubber latex (Type I)
  a) Itching, swelling or redness after contact with rubber products
  b) Swelling of tongue or lips after dental examinations or blowing balloons
G3 Group at risk but without history of natural rubber latex sensitivity
  a) Repeated catheterisation eg. Spina bifida, urogenital abnormalities
  b) Atopic nature/multiple allergies especially specific fruits eg. bananas, avocado, kiwi.
G4 Type IV chemical sensitivity

Management of Groups 1&2: Total NRL Free Environment Essential

Management of Group 3&4: Use NRL-Free Gloves And Maintain A High Degree Of Suspicion

3.Management of Groups at risk by individual department

It is not practical to test every patient with a suspected natural rubber latex allergy; each patient should be assessed and referred if appropriate to the Immunology Department. In each area there should be a designated link person who is available for communication when a natural rubber latex allergic patient presents. There should also be an NRL-free box and information pack in each area. The link person should be responsible for checking the contents of the NRL-free box and restocking it regularly.

Suggested box contents are:
NRL-free sterile and examination gloves
NRL-free sphygmomanometer cuff
NRL-free giving set
Products specific to the specialist area
NRL-free oxygen mask

Wherever possible and where cost-effective, all products purchased for wards and department should be NRL-free. Where products are seldom used, these might be shared between specialist areas. All products contained within the box should be listed and staff should be aware of their location.

Identification of patients with natural rubber latex allergy and their subsequent care

Patients need to be encouraged to disclose if they have a natural rubber latex allergy by being asked about allergies and rashes related to contact with rubber and food allergies. A notice should be prominently placed in each patient waiting area which reads, "Are you allergic, or do you react to, any medicines, foods or other substances? If so, please inform staff before receiving any treatment." Patients reporting an allergy should complete the full screening questionnaire (Appendix 1) and have their notes labelled appropriately (Appendix 2). Medical staff should be

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advised of the sensitivity and its implications. Staff members should inform Occupational Health if they believe that they are natural rubber latex sensitive.

3.1. Outpatient clinics and Assessment clinics

This may be the first hospital point of contact for the patient so it is important to identify latex sensitive patients here using the screening questionnaire (Appendix 1). All staff should be trained to be aware of the implications of natural rubber latex sensitivity and the need to screen patients. Staff should be aware of risk groups which include: -

- Atopic patients
- Patients with spina bifida
- Health care workers
- Patients with a history of a large number of operations.

All patients attending clinics should be asked about any allergies. If positive responses are given which lead staff to question a latex allergy, the full screening questionnaire should be filled in. (Appendix 1)

If a patient is identified as having a latex allergy, then proceed as follows: -

- Label patient's notes with allergy sticker
- Alert medical staff, who may arrange appropriate investigations
- Alert all other staff who will be in contact with the patient
- Ensure that only NRL-free products are used and if this is impossible, cover couches with a sheet, and other natural rubber latex items with stockinette. (e.g. BP cuffs and stethoscopes)
- Clinics should have dedicated examination trolleys that contain only NRL-free products

3.2 Plaster room

- The plaster room should not be used for at least and hour before treating an NRL-allergic patient if NRL has been used in the room.
- All patients should have been screened in clinic but staff should ask patients if they have allergies and progress to the NRL allergy screening questionnaire, if appropriate.
- Any patient identified as being in a risk group for NRL allergy, should be treated as in the protocol for assessment and out patient clinics
- All plaster room products which contain NRL should be clearly labelled, with an updated list displayed in treatment areas and side rooms.

3.3 Ward Preparation

All staff need to be aware when a patient with NRL allergy is admitted. All wards should keep a list of items in their area that contain natural rubber latex. Every ward should hold a stock of the following NRL-free items: -

- Non-sterile Nitrile gloves
- NRL-free syringes
- Stockinette and NRL free adhesive tape to cover NRL tubing etc where it can not be replaced
- NRL-free products particular to the specialty
- Expensive and rarely used products should be kept centrally within specialty areas to be shared throughout the specialty.

The patient should be nursed in a cubicle from which all items containing natural rubber latex have been removed. An NRL-free bed and mattress should be used. A clear notice should be on the door. Aprons and NRL-free gloves should be by the door (not simply hypoallergenic gloves,

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which may still contain NRL). If the patient has to be nursed in an open ward, precautions should be taken to ensure that there are no NRL items near their bed-space.

ACTION	**NOTES**
Before to admission, ward cubicle/bed space should cleaned by staff wearing NRL-free gloves	To remove NRL proteins.
All items containing NRL should be removed or, if not possible, covered with stockinette and secured with NRL-free tape.	To prevent NRL from coming into contact with the patient.
An NRL-free mattress and bed should be used	As above
Use NRL-free blood pressure cuffs and oximeter probes or cover with stockinette and NRL-free adhesive tape	As above
Aprons and NRL-free gloves should be by the door (not simply hypoallergenic gloves)	As above
Warning signs should be placed on doors, medical notes, prescription charts, observation charts	To alert staff and visitors
Use red bracelet	To identify patient as allergic
Ensure there are no elastic bands around the notes	To prevent contamination of patient area
NRL-free anti-embolism stockings	To prevent exposure to latex
When preparing IV medication, use ampoules wherever possible, otherwise remove bungs before drawing up. Liaise with pharmacists for alternative medication/presentation	To avoid contamination of the medication with NRL proteins from the bung.
Cover latex IV ports in giving sets (NRL-free are available)	Use three way taps in preference to ports if unsure whether the giving set contains NRL.
If patient needs further investigations e.g. X-ray, scan, ensure that department staff are informed of latex status of patient	
If patient is to have surgery, ensure theatre staff are informed of the patient's allergy	To enable theatre staff to plan and prepare theatre
Give patient information about Latex Allergy Support Group	To reduce the patients fears and feeling of isolation

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3.4 Preoperative theatre planning

The surgical team responsible for the patient must inform theatre staff, the anaesthetist and ward staff of a patient with known or suspected NRL allergy or sensitivity **before** admission to hospital, whenever possible. The whole team including porters and recovery staff, need to know so that the necessary precautions to be taken.

Any suspected allergic patient should be treated as "latex allergy at risk of anaphylaxis" with a completely latex-safe environment.

The patient should be first on the operating list and the theatre prepared at least one hour in advance, or the night before if practical. This is to allow a reduction in the number of NRL particles in the air.

The patient should be anaesthetised in theatre and may also need to be recovered in theatre. All items containing NRL should be removed from the theatre and recovery bay. Where this is not possible, these items should be covered and a notice attached, "DO NOT REMOVE – contains latex". Equipment that should be removed or covered includes: all NRL gloves, NRL anaesthetic breathing circuits, NRL re-breathing bags (usually black), trolleys whose NRL content cannot be determined, tourniquet machines if not required, all stools, chairs and platforms. If no replacement is available, cover with stockinette or a pillowcase and seal with NRL-free tape if required. Nitrile or other synthetic gloves should be worn for cleaning, if gloves are required.

All equipment used while caring for the patient in perioperative areas should be from the NRL-free trolley only. This is kept in a designated area in the department and is kept covered. An NRL-free box specific to paediatric patients should be shared between appropriate areas

Ideally, the patient should be brought to theatre on a bed with an NRL-free mattress. If the patient comes on a trolley, it should be covered with a cotton sheet if the cover is damaged and the mattress is natural rubber latex.

There should be as few staff in theatre as possible. All staff must wash their hands, especially if they have handled natural rubber latex products. If it is necessary for gloves to be worn, they should be made of a synthetic, either Nitrile sterile or exam for body fluid interaction, vinyl for cleaning tasks and no gloves if none are required. "Hypoallergenic" gloves are not necessarily NRL-free.

The NRL-free trolley should contain everything needed during the anaesthetic and surgery. Attached to the trolley is a list to double check products and their codes and there is also a list of other NRL-free products available within the department. The anaesthetic trolley should then follow the patient through into recovery if the patient is to be recovered there.
Visible notices that the patient has NRL sensitivity should be placed at all entrances to the theatre.

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3.5 Anaesthesia

At the discretion of the anaesthetist, patients with a true Type I NRL allergy can be premedicated with intravenous chlorpheniramine 10mg, ranitidine 50mg and hydrocortisone 100mg starting from the night before surgery.

The patient should have a red allergy bracelet clearly visible. The anaesthetic room is not suitable for the NRL allergic patient. The patient should be anaesthetised in theatre and if necessary also recovered there.

Ventilation and airway Management

A new NRL-free anaesthetic breathing circuit and rebreathing bag should be used, the old one having been removed the night before surgery if possible. Anaesthetic filters should be used at the patient end of the circuit. A clear facemask should be used. The anaesthetic machine should be investigated and assured as being natural rubber latex-free. All other equipment should be checked for their NRL content and replaced or covered as appropriate.

Remove any NRL bougies from the anaesthetic machine; the new one from the latex-free trolley should be used. New suction tubing and Yankauer suckers should be used. LMAs, ET tubes and associated equipment should be used only from the NRL-free trolley. (new equipment, therefore uncontaminated)

If gloves need to be worn for intubation, ensure that these are NRL-free. Some stethoscopes and sphygmomanometers have NRL tubing; these should be covered with stockinette and sealed with latex free tape.

Monitoring

ECG, blood pressure and invasive monitoring cables should be covered with camera covers and/or cotton tape and secured with NRL-free tape prior to use. The same equipment can follow the patient through to recovery. If there is any doubt about the NRL status of the BP cuff, a barrier should be put between it and the patient's skin ensuring that the leads do not touch the skin. ECG leads should not touch the skin if the NRL status is now known. Finger probes for pulse oximetry may contain latex.

Intravenous Equipment

On the NRL-free trolley there is a section containing suitable intravenous cannulae, syringes, dressings and giving sets. Drugs in vials with rubber bungs should have the bung removed and the drug prepared in the vial. BUNGS MUST NOT BE PIERCED. Some Pre-filled syringes should not be used, as there is the possibility of leach out of NRL into the solution from the rubber bung.

Regional/nerve block equipment

Suitable NRL-free equipment is contained in a section of the NRL-free trolley.

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3.6 Theatre

The status of each operating table should be identified. If there is any doubt or it is found to contain NRL it should be covered with a cotton sheet. If there is any doubt about props and supports or they are found to contain NRL, they should be covered with a pillowcase.

Trolleys whose NRL content cannot be determined and other unnecessary equipment should be removed from theatre. All NRL gloves should be removed from the scrub area or covered to prevent use. Use only NRL-free products, especially implants or products that come into contact with mucosa or viscera (eg, Fishlie clip). Do not use rubber-covered clamps. Do not use rubber capillary tubing or slings.

All power hoses and light leads should be identified as NRL-free or not. If they contain NRL they should be covered with an NRL-free camera cover. The scrub nurse must change gloves following this procedure as contamination may have occurred. If tourniquet machine/cuffs are required, leads should be covered with stockinette and sealed with NRL-free tape to prevent contact with patient skin.

*Pressure lavage **must** be checked as the washers may contain latex; in this instance, latex-free syringes must be used instead.*

Image intensifiers can be used although they may have NRL components, which will not be problematic unless touched. A Mayo cover should be used to cover the C-arm, not the plastic image intensifier cover. NRL free image intensifier covers are available.

3.7 Recovery

If the patient is not to be recovered in theatre, a designated area should be prepared in recovery with all NRL equipment removed. A screen should be placed around the patient displaying "Latex Allergic" signs.

All gloves containing latex should be removed from the area and replaced with NRL-free gloves. The NRL-free trolley should follow the patient through to recovery and only equipment from this should be used.

If required, ECG, BP and cables for invasive monitoring follow the patient through from theatre. If they are not compatible with recovery oximeters, pulse oximetry probes should be adapted or brought from theatres.

3.8 Laparoscopy (site specific)

- Ensure that all staff are aware that the patient is Latex Allergic
- Put a warning notice at each entrance to the theatre
- Ensure that NRL-free gloves are available for staff
- Remove or cover all NRL products e.g. stools, microscope, table accessories etc.
- Wear surgeons hoods without elasticated backs

- Borrow Latex-Free trolley from Theatres
- Check table and lithotomy poles for NRL content and cover if NRL or unsure

ALWAYS WASH HANDS AFTER CONTACT WITH NRL

Instruments

The bung in the introducer and in the peel-apart may contain latex

- Have a bowl of saline or water available
- Plastic tube covers are available to cover light leads.
- Use an NRL-free introducers
- Wash all other instruments in a bowl of water or saline to remove any NRL contamination
- Use NRL free swabs.

3.9 Maternity Services

Antenatal

Clients should inform the unit of their NRL Allergy when booking (usually at 10-20 weeks gestation), so that their Community Midwife and GP are aware for home and surgery visits.

Clients carry their own maternity notes, so the allergy information may not be in hospital notes.

Maternity services rely on their clients to tell them of their allergic status when they telephone for advice regarding their admission for labour or assessment.

Maternity Services can arrange for them to see the Consultant Anaesthetist or a Midwife to discuss any concerns prior to admission.

NRL Free equipment

A stock of NRL free equipment is kept on the delivery suite for use in the unit. Two boxes are kept ready for use with NRL Free kit – One for ward use and one for delivery suite use. Each has a copy of the protocols and useful information.

Prior to admission

The room or bedspace is cleared of any equipment containing NRL then cleaned by staff wearing latex free gloves (to remove latex proteins). The NRL Free box is then placed in the room.

Care in Labour

Antenatal and care in labour as usual, ensuring that only NRL free equipment is used. NRL-free tape is used to attach foetal monitoring equipment. Check that Ventouse and forceps are NRL Free.

As Ward protocols.

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Central Delivery Suite Theatres

As Theatre protocols.

a) A trolley is kept in Theatre B stocked with NRL Free equipment. The theatre bed mattresses are not NRL-Free. A sheet must be used as a barrier between the patient and the mattress to remove the risk of NRL contamination.
Emergency Caesarian sections for NRL allergic clients performed in Theatre B as NRL free equipment is there, therefore less latex particles likely. Prior to elective Caesarian of a client with NRL Allergy, one theatre (B) is cleaned during the night and this patient will be the first case on the list. All emergency cases will go to theatre (A) in the meantime.
Obstetric cases are always anaesthetised in theatre (not anaesthetic room).

b) Recovery — Identify bedspace as NRL-Free
NRL-free equipment used.
NRL-Free anti-embolism stockings as necessary

Post Natal Care

As Ward protocol
Bedspace identified
NRL-free equipment

Drugs to treat anaphylaxis/reaction

Kept in Cardiac Arrest box in Anaesthetic room.
Emergency trolley in Recovery

3.10 Path Labs

Staff will be informed of the symptoms and signs of NRL allergy. They should inform their managers/Occupational Health if they develop possible allergic reactions (see Section 5).

Pathology departments will order and use only powder free-NRL gloves.

Nitrile gloves will be available as an alternative.

Allergic persons will be informed of reagents and equipment containing NRL

4.Management and investigations after a suspected Type I NRL allergy reaction or anaphylaxis.

IgE-mediated Type I reactions may present as generalised urticaria, asthma or rhinoconjunctivitis. However, life-threatening anaphylactic reactions have occurred on exposure to mucous membranes or tissues to natural rubber latex during surgery.

Onset is **insidious,** occurring at least 15 minutes after initial contact and progressively worsening over a further 5 – 10 minutes with hypotension and bronchospasm.

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Drugs for the treatment of anaphylaxis should be freshly drawn up and be readily available. Dilute solutions of adrenaline should be prepared in anticipation and 0.1mg/kg adrenaline administered if early signs or symptoms of anaphylaxis develop.

If a patient with known latex allergy has a suspected anaphylactic reaction during anaesthesia, the guidelines of the Association of Anaesthetists, 'Management of a patient with suspected anaphylaxis during anaesthesia' (Feb 1998), should be followed. A copy of this document should be kept in every theatre.

Primary therapy

Remove the NRL source and call for assistance.
Maintain airway, give 100% oxygen
Give adrenaline (0.5 to 1ml of 1:10,000) in increments according to blood pressure.
Start intravascular volume expansion with suitable crystalloid or colloid.

Secondary therapy

Administer chlorpheniramine 10-20mgs; ranitidine 50mgs IV & hydrocortisone 100-300mgs IV.
Catecholamine infusion: adrenaline or aoradrenaline
Bicarbonate if acidotic
Bronchodilators for persistent bronchospasm

Take blood samples

15mls for mast cell tryptase, specific IgE antibodies and complement C3& C4 at 1,3 and 8-12 hours after suspected reaction, taken in two samples. 10mls in activated gel bottle (brown top) for serum and 5mls in EDTA (purple) bottle. Ask the lab to separate and freeze the serum at -20°C. Give full information about the suspected reaction. It is the responsibility of the anaesthetist to refer the patient to Immunology.

5 NRL allergy or glove reactions in Staff

NRL allergy is included in pre-employment screen by Occupational Health
Departments are to order only powder-free NRL gloves
Staff will be made aware of the potential for NRL/chemical allergy and associated symptoms, e.g. urticaria, skin dry, blistered or cracked, irritation, itchy eyes, swelling of lips and tongue, breathlessness/asthma, or, exceptionally, abdominal pain, hypotension and anaphylaxis.
Staff who show any allergic signs are to report immediately to a senior member of staff who will then refer them to Occupational Health
Staff can seek advice directly from Occupational Health
Occupational Health will give advice on necessary measures to be taken if a member of staff is diagnosed with NRL allergy.
Nitrile gloves will be available as an alternative.
Allergic persons will be informed of materials and equipment containing NRL.

6 References

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Natural Rubber Latex Allergy Patient Screening Questionnaire

When patients are first being assessed, whether in outpatients, assessment clinics, admission or prior to any intervention in clinical settings, it is important that their allergic status is determined as far as is possible. This assessment tool should aid that process.

1. Initial Assessment

i. Ask the patient if they have an allergy to any medicines, foods or other items

ii If the patient states that they have no allergies then treat as normal

iii If the patient states that they are allergic to any of the following, this should trigger additional questioning; balloons, contraceptives, rubber gloves, dental blocks, hot water bottles, erasers, rubber bands/balls, pillows, elastic dressing and bandages, elastic waistbands/underwear.

iii If the patient states that they are allergic to any of the following, this should trigger additional questioning; apples, avocados, bananas, celery, cherries, chestnuts, ficus, figs, grapes, kiwi, latex, mangoes, melons, passion fruit, peaches, pears, pistachios, potatoes, ragweed, strawberries, tomatoes.

TREAT AS HIGH RISK

2. Further questions

a Ask the patient what symptoms they experience when they eat/touch the products listed above

b If the patient states any of the following symptoms, further questions should be asked; breathlessness, skin redness, chapping or cracking of hands, swelling of lips or tongue, runny nose, congestion, hives, itching.

TREAT AS TYPE I

3. Assessment conclusion

If the patient in addition to positive responses to the questions above, suffers from any of the following then treat as a high risk individual and follow the protocol;

Contact dermatitis
Eczema
Asthma
Auto-immune disease (Lupus etc)
Hay fever

Spina bifida
Multiple genitourinary surgery

TREAT AS TYPE I

If the patient assessment results in a high-risk outcome, then label the patient's notes and notify all others who may treat the patient. If the patient is to be admitted, use a red identification bracelet.

Refer to the Ward and Department Protocols for further advice