American Association of Nurse Anesthetists
Latex Allergy Protocol

This latex allergy protocol was developed by the AANA Infection/Environmental Control Task Force and was approved by the AANA Board of Directors in April 1993.

Introduction

In the past four to five years, latex allergy has been recognized as a significant problem for specific patients (e.g., patients with spina bifida requiring multiple surgeries) and healthcare workers. Approximately 0.8% of the population is latex sensitive. However, patients and/or healthcare workers who have frequent exposure to latex devices such as gloves, catheters, and drains may be sensitized. It has been reported that 6-7% of surgical personnel and 18-40% of spina bifida patients are latex sensitive. It is estimated that 7.5% of surgeons and 5.6% of nurses are sensitive to latex or the chemicals used in processing latex. Latex, the sap of the rubber tree Hevea Brasiliensis, contains low molecular weight soluble proteins which are the likely allergy cause. New rubber products, especially very soft (“dipped”) products contain the greatest proportion of these soluble proteins.

Immediate hypersensitivity reactions to latex vary from contact urticaria to systemic anaphylaxis that requires lifesaving intervention.

Anaphylactic reactions have complicated a variety of common medical procedures including surgery (particularly of the genitourinary tract) and anesthesia, barium enemas, as well as oral, vaginal, and rectal examinations utilizing latex gloves. In most cases, there has been contact between latex products and mucous membranes. However, in some exquisitely sensitive individuals, exposure through inhalation of aerosolized latex or through intravenous administration has led to severe reactions. The type of reactions is similar to immediate drug reactions or stinging insect venom and may be associated with rapidly progressive anaphylaxis and death.

The most reliable screening test for predicting an anaphylactic reaction to latex is a medical history, as sensitive and specific reagents with rapidly progressive anaphylaxis and death. This should encompass a first-aid protocol in the event a severe reaction should arise.

The room needs to be labeled latex free to avoid personnel from bringing rubber products (wrist bands, chart labels, bed, room signs, etc.) into the room.

A readily available master list of latex-free devices and products should be developed.

Establish a latex consultant in your institution; an allergist is recommended.

Develop programs to educate healthcare workers in the care of latex-sensitive patients.

Develop educational programs for patients and their families in the care and precautions that should be taken to prevent latex exposure. This should encompass a first-aid protocol in the event a severe reaction should arise.

Encourage latex-sensitive patients to obtain and carry with them, at all times, some type of identification such as a medical alert bracelet.

Population Considered High Risk for Developing Latex Allergy

Individuals considered high risk for developing latex allergy should be labeled latex risk, and those that have known or suspected allergy to latex should be labeled latex allergy.

Patients (particularly of the pediatric age group) who are considered high risk include:

- Those with neural tube defects — Myelomeningocele/meningocele
- Spina bifida
- Lipomyelomeningocele
- Patients requiring chronic bladder catheterizations — Spinal cord trauma
- Exstrophy of the bladder
- Neurogenic bladder
- Patients that have multiple operations
- Those with a history of atopy and multiple allergies
- Patients with occupational exposure to latex — Workers in latex industry
- Healthcare workers
- Those with a history of allergic reaction after touching balloons, rubber gloves or powder from rubber gloves, dental dams, latex consumer products, and medical devices; especially atopic patients
- Those with a history of having experienced anaphylactic reaction during surgery, urinary catheterization, rectal or vaginal examination, and/or bladder stimulation
- Healthcare personnel and others who wear latex gloves, due to the generalized usage of universal precautions, may become sensitized
- Healthcare providers or other workers who give a history of mild latex glove eczema rarely have anaphylactic events. However, a history of severe or worsening latex glove induced eczema, urticaria, or work-related conjunctivitis, rhinitis, asthma, or urticaria may indicate allergic sensitization and increase the risk for more severe reactions in the future.

Late Avoidance Precautions

By touching any latex object, the healthcare worker can transmit the allergen by hand to the patient. Caution should be taken to keep the powder from the gloves away from the patient because the powder will act as a carrier for the latex protein. Therefore, in order to reduce the possibility of the latex protein becoming airborne, care must be taken not to snap gloves on and off.

Patients should be identified as being latex sensitive. The Operating Room

The Operating Room

- Remove all latex products from the operating room.
- Bring a latex-free cart (if available) into the room.
- Use a latex-free reservoir bag. If not available, cover the existing one with a plastic bag and secure with tape.
- Use a non-latex circuit with plastic mask and bag.
- Ventilator bellows must be a non-latex bellows.
- Place all monitoring devices, cords/tubes (oximeter, blood pressure, ECG wires) in stockinet and secure with tape.

Intravenous Line Preparation

- Use intravenous (IV) tubing without latex ports.
- If unable to obtain IV tubing without latex ports, cover latex ports with tape.
- Cover all rubber injection ports on IV bags with tape and label in the morning. This will allow latex dust (from the previous day) to be removed overnight.

Operating Room Patient Care

- Use non-latex gloves. (Use caution when selecting non-latex gloves. Not all substitutes are equally impermeable to bloodborne pathogens; care and investigation should be taken in the selection of substitute gloves.)

Schedule latex-allergy and/or latex-risk patients as the first case(s) in the morning. This will allow latex dust (from the previous day) to be removed overnight.

The Operating Room

- Remove all latex products from the operating room.
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Intravenous Line Preparation

- Use intravenous (IV) tubing without latex ports.
- If unable to obtain IV tubing without latex ports, cover latex ports with tape.
- Cover all rubber injection ports on IV bags with tape and label in the following way: Do not inject or withdraw fluid through the latex port.

Operating Room Patient Care

- Use non-latex gloves. (Use caution when selecting non-latex gloves. Not all substitutes are equally impermeable to bloodborne pathogens; care and investigation should be taken in the selection of substitute gloves.)
Use non-latex tourniquets/may use non-latex examination glove or polyvinyl chloride tubing.

- Draw medication directly from opened multidose vials (remove stoppers) if medications are not available in ampoules.
- Draw up medications just prior to the beginning of the case. The rubber allergen could leach out of the plunger of the syringe causing a reaction.
- Glass syringes are another alternative.
- Use stopcocks to inject drugs rather than latex ports.
- Minimize mixing/agitating lyophilized drugs in multidose vials with rubber stoppers.
- Notify Pharmacy and Central Supply that the patient you are caring for is latex sensitive so that these departments can use the appropriate procedure when preparing preparations for the patient.

**Signs and Symptoms of Allergic Reactions to Latex**

Symptoms usually occur within 30 minutes from anesthesia induction. However, the time of onset can range from 10-290 minutes.

<table>
<thead>
<tr>
<th>Awake Patient</th>
<th>Anesthetized Patient</th>
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<tbody>
<tr>
<td>Itchy eyes</td>
<td>Tachycardia</td>
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<tr>
<td>Generalized pruritus</td>
<td>Hypotension</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>Wheezing</td>
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<tr>
<td>Feeling of faintness</td>
<td>Bronchospasm</td>
</tr>
<tr>
<td>Feeling of impending doom</td>
<td>Cardiorespiratory arrest</td>
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<tr>
<td>Nausea</td>
<td>Flushing</td>
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<tr>
<td>Vomiting</td>
<td>Facial edema</td>
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<tr>
<td>Abdominal cramping</td>
<td>Laryngeal edema</td>
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<tr>
<td>Dizziness</td>
<td>Unicaria</td>
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<tr>
<td>Wheezing</td>
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**Management**

- All the following should be done to manage a latex allergic reaction:
  - Remove latex agents, if possible. **Do not delay immediate emergency therapy.**
  - Stop treatment/procedure.
  - Support airway—administer 100% oxygen.
  - Start intravascular volume expansion with *Ringer's lactate* or normal saline.
  - Administer epinephrine* 0.5-1.0 mg/kg bolus (10 mg/mL dilution). May need to repeat dose or give subcutaneously or by continuous infusion.

**Secondary Treatment:**

- Diphenhydramine* 1 mg/kg IV (maximum dose 50 mg).
- Methylprednisolone* 2 mg/kg IV (maximum dose 125 mg).
- Rantididine 0.5 mg/kg IV every 6 hours for 2-4 doses (maximum dose 50 mg).

*These drugs and fluids should be readily available for timely administration.

**Recommended Premedication Prior to Procedure**

The use of preoperative prophylaxis may not change the rate of anaphylaxis but may lessen the severity of a reaction. All of the following are recommended:

**Outpatient**

- Prednisone: 1mg/kg by mouth every 6 hours (maximum dose 40 mg/dose) for 12-24 hours prior to the patient arriving at the hospital and 1 hour prior to the induction of anesthesia
- Hydroxyzine: 0.7 mg/kg by mouth every 6 hours (maximum dose 50 mg/dose) for 12-24 hours prior to the patient arriving at the hospital and 1 hour prior to the induction of anesthesia

**Inpatient**

- Methylprednisolone: 1 mg/kg IV every 6 hours for 2-4 doses (maximum dose 125 mg)
- Diphenhydramine: 1 mg/kg IV every 6 hours for 2-4 doses (maximum dose 50 mg)
- Rantididine: 0.5 mg/kg IV every 6 hours for 2-4 doses (maximum dose 50 mg)

Medication may be discontinued postoperatively if there is no evidence of an allergic reaction intraoperatively or postoperatively.

Inpatients with known latex allergy should be continued on the inpatient protocol for 24 hours postoperatively.

**Common Latex Medical Devices Used in the Hospital**

- Mattresses found on stretchers
- Rubber gloves
- Adhesive tape
- Urinary catheters
- Electrode pads
- Wound drains
- Stomach and intestinal tubes
- Condom urinary collection devices
- Protective sheets
- ENEMA tubing kits
- Dental cofferdams
- Rubber pads
- Fluid circulating warming blankets
- Hemodialysis equipment
- Ambu bags
- Bulb syringes
- Elastic bandages, Ace™ wraps
- Medication vial stoppers
- Stethoscope tubing
- Band-Aids™ and other similar products
- Gloves — examination and sterile
- Patient controlled analgesia syringes
- Tourniquets

**Anesthesia Equipment Containing Latex**

- Rubber masks
- Electrode pads, e.g., electrocardiogram, peripheral nerve stimulator
- Head straps
- Rubber tourniquets
- Rubber nasal-phyrgeal airways
- Rubber oral-phyrgeal airways
- Teeth protectors
- Bite blocks
- Blood pressure cuffs (inner bladder and tubing)
- Rubber breathing circuits
- Reservoir breathing bags
- Rubber ventilator hoses
- Rubber ventilator bellows
- Rubber endotracheal tubes
- Latex cuffs on plastic tracheal tubes
- Latex injection ports on intravenous tubing
- Certain epidural catheter injection adapters
- Multidose vial stoppers
- Patient controlled analgesia syringes
- Rubber suction catheters
- Injection ports on intravenous bags

**References**