

Deciphering Glove Allergies

Healthcare workers may experience some type of reactions to gloves but may not know the specific causes. The guide below is helpful in identifying the causes and solutions.

Reactions to Latex

Natural rubber latex is a key component of many healthcare products, including medical gloves. There are thousands of consumer products that also contain latex, such as clothes, adhesives, paint, rubber bands, etc., and avoidance of latex entirely is almost impossible. Latex-allergic individuals may typically suffer from a Type I allergic reaction to the latex proteins found in all natural rubber latex products. Symptoms may include an immediate reaction to latex gloves, respiratory problems, itchy eyes, runny nose, and hives. All natural rubber latex gloves contain latex proteins, but some gloves are specially processed to minimize protein levels. Latex-allergic individuals should use latex-free gloves and it is suggested in the literature that their coworkers should use powder-free latex gloves or latex-free gloves to prevent aeroallergen transmission.

Reactions to Chemicals

Manufacturers use a variety of chemicals to produce both latex and latex-free gloves. These chemicals include accelerators such as thiurams, carbamates, and mercaptobenzothiazole that help to speed the curing process; antiozonates; antioxidants such as BHA and BHT; and preservatives such as formaldehyde. Different manufacturers use different chemical combinations, and nearly all manufacturers leach and wash their gloves to minimize residual chemicals in the final product. Chemical-allergic individuals may suffer from a Type 4 delayed reaction. Symptoms may appear within six to

forty-eight hours. Clinically a red raised and palpable cut and slightly beyond the area of contact with the glove is observed, accompanied by subjective symptoms such as itching, burning, and tingling. Chemical-allergic individuals should use gloves that do not utilize the causative agent or gloves that have demonstrated a reduced potential for reaction in individuals sensitized to the causative agent.

Reactions to Glove Powders

Cornstarch powder is used to detackify gloves and to aid in donning. Surprisingly, true allergic reactions to cornstarch powder are rare. However, cornstarch powder applied to natural rubber latex gloves have been demonstrated in the literature to bind with latex protein and can carry these allergens to the user. Powder can also irritate and dry the skin, a situation often confused with an allergic reaction. Users irritated by glove powders should switch to powder-free gloves.

Other Types of Reactions

Skin reactions on the hands are not always caused by gloves. Clinicians can experience irritation or allergies from insufficient hand rinsing, disinfectants, soaps, hand lotions, etc.

Solving the Problem

The best way to identify the source of a reaction is to see an allergist or dermatologist. Once the causative agent is identified, exposure should be minimized or eliminated. Powder-free gloves are recommended over powdered gloves in general. Latex-allergic individuals should switch to latex-free gloves. Chemical-allergic individuals should switch to gloves that have demonstrated a reduced potential for reaction in individuals sensitized to the causative agent.

Proper Glove Storage

- Store gloves in a cool dry, environment with a temperature ranging between 50°-72° F (10°-22° C)
- Avoid storing gloves near chemicals, heat, humidity, ultraviolet light, high-energy radiation, ozone, and stress
- Avoid a large inventory of palletized powder-free, latex gloves
- Remove shrink-wrap from pallets of stacked cartons
- Break apart stacked cartons on each pallet and restack or reconfigure cartons to facilitate cooling ventilation
- Check all gloves for characteristics suggesting deterioration, such as brittleness, tackiness, or an acid chemical odor or stench, and discard if any abnormalities are noted
- Rotate your powder-free, latex glove stock using "first in, first out" practices

GLOVING MATERIALS

Gloving Materials

A Guide to Medical Glove Selection

Choosing the right glove for the right situation

With the heightened awareness of latex-allergy issues, many types of medical gloves are available to the end user. Each of them offers unique advantages, but at the same time, each of them comes with properties unique to the gloving materials.

No single glove provides the “perfect” solution for all applications, and it is nearly impossible for a hospital to standardize on a single type of glove material without encountering difficulties.

• **Latex** has long been the benchmark standard for fit, feel, comfort, strength and barrier protection. Available as an examination and sterile surgical style glove.

• **Nitrile** has become more popular in recent years because it offers excellent tear and chemical resistance, although it costs more than other glove materials. Available as an examination style glove—sterile and non-sterile.

• **Neoprene** has been a popular latex alternative in the OR and more recently as an examination style glove. It is one of the most “latex-like” synthetic glove films. It offers superior comfort but is more expensive than latex. Available as an examination and sterile surgical style glove.

• **Vinyl**, while an economical alternative to latex, is associated with reduced barrier protection due to its susceptibility to tears, breakage and pinholes. Available only as an examination style glove.

• **Polyisoprene** is the new alternative to latex. It has a fit and feel that is very close to latex. It may be associated with reduced barrier protection. Available only as a sterile surgical style glove.

Exam Glove Use

Risk	Criteria	Example	Glove Selection—Non-Sterile
Low Risk	<ul style="list-style-type: none"> No blood contact No body fluid contact Intact skin Low level of glove stress 	<ul style="list-style-type: none"> Food handling Dispensing medications Patient transport Non-invasive physical exams 	<ul style="list-style-type: none"> Vinyl exam or Latex exam glove
Medium Risk	<ul style="list-style-type: none"> Blood contact Body fluid contact Procedures that stress the glove Invasive procedures 	<ul style="list-style-type: none"> Incontinent care Wound care Rectal exams Ostomy care Staple removal IV insertion, injections Isolation precautions 	<ul style="list-style-type: none"> Latex exam glove or Nitrile exam glove or Neoprene exam glove
High Risk	<ul style="list-style-type: none"> High risk of infection of HIV, HBV, HCV Chemotherapy administration High risk of blood and bone fragments 	<ul style="list-style-type: none"> Handling chemotherapy agents Emergency department ICU 	<ul style="list-style-type: none"> Latex exam glove or Nitrile exam glove or Neoprene exam glove

This chart provides medical professionals with an easy-to-use guide for choosing the best glove film for their particular applications. Ansell’s solution-oriented approach to medical gloves provides you with product options in latex, neoprene, nitrile, polyisoprene and vinyl.

GLOVE TYPE	Level of Barrier Protection	Allergen Content	Strength and Durability	Elasticity	Puncture Resistance	Fit and Comfort	Chemical Resistance*	Economy	Recommended Use	Environmental Impact
 LATEX	Excellent The long-standing benchmark for barrier protection due to its strength and elasticity.	Varies Latex contains protein and chemical allergens. Powder-free gloves are lower in allergens than powdered gloves.	Excellent Natural rubber latex is very strong and durable. Tensile strength is typically 3000 psi or better.	Excellent Latex elasticity is superior to the other glove films currently available. Memory is very high allowing the film to always return to its original shape. Elongation limit is about 750%.	Very Good Latex is very resistant to punctures but can be pierced by very sharp objects.	Excellent Latex provides excellent comfort and fit due to its high elasticity and memory.	Good Provides good protection from most caustics and detergents. Also recommended by OSHA for cytotoxic drugs.	Very Good Latex provides very good economy for general use. Powder-free versions are more expensive than powdered.	This is for layout purposes only and not meant to be read for content.	Excellent Easily decomposes in landfills because it is a natural product. Incineration produces mostly water and carbon dioxide.
 NEOPRENE	Very Good Neoprene provides barrier protection similar to latex.	Excellent Neoprene contains no latex proteins but contains a low level of chemical allergens.	Very Good Unbroken neoprene is strong. However, once punctured, the film tends to tear easily. Tensile strength is typically 3000 psi or better.	Excellent Neoprene elasticity is close to that of latex and memory is very high, allowing the film to retain its original shape. Elongation limit is about 750%.	Good Neoprene is somewhat puncture resistant.	Excellent Neoprene provides excellent comfort and fit due to its high elasticity and memory.	Excellent Neoprene exhibits good resistance to most chemicals, oils and fats.	Good Neoprene is more expensive than latex but can be justified when weighed against the cost of managing latex allergies.	This is for layout purposes only and not meant to be read for content.	Varied Does not decompose in landfills. Incineration produces significant amounts of hydrochloric acid.
 NITRILE	Excellent Nitrile film is highly resistant to punctures and tears.	Very Good Nitrile contains no latex proteins but contains some curing agents.	Excellent Nitrile film is extremely strong with puncture resistance superior to all glove films. Tensile strength is typically well above 3000.	Very Good Nitrile elasticity is very good with elongation limits typically 500% or better. Nitrile exhibits some memory, allowing the film to adapt to the wearer’s hand.	Excellent One of nitrile’s strong points. Puncture resistance is superior to all other medical glove films currently available.	Very Good Nitrile provides very good comfort and fit due to its high elasticity and memory. Due to a slightly tighter fit, users often choose a larger size.	Excellent Nitrile exhibits excellent resistance to most chemicals especially harsh solvents. OSHA recommends nitrile for cytotoxic drugs.	Good Nitrile is more expensive than latex but can be justified when weighed against the cost of managing latex allergies.	This is for layout purposes only and not meant to be read for content.	Varied Does not decompose in landfills. Incineration produces mostly water and carbon dioxide.
 POLYISOPRENE	Fair Polyisoprene is a good barrier protection but is more permeable than latex. Resistant to punctures.	Very Good Polyisoprene contains no latex proteins but contains some curing agents.	Very Good Polyisoprene is durable. Tensile strength is typically 2500 psi or better.	Excellent Polyisoprene elasticity is similar to natural rubber.	Good Polyisoprene is somewhat puncture resistant.	Very Good Polyisoprene provides very good comfort and fit due to similar properties to natural rubber latex, but slightly stiffer.	Fair Polyisoprene provides fair protection against alcohol and other water-based solutions.	Good Polyisoprene is more expensive than latex but can be justified when weighed against the cost of managing latex allergies.	This is for layout purposes only and not meant to be read for content.	Varied Does not decompose in landfills. Incineration produces mostly water and carbon dioxide.
 VINYL (Polyvinyl Chloride, PVC)	Poor Vinyl breaks and punctures easily during use, and the fit around the wrist is baggy, making it a poor barrier.	Very Good Vinyl contains no natural rubber proteins and no chemical curing agents.	Poor Vinyl is the weakest of the glove films and tends to break and puncture easily when stressed. Tensile strength is typically below 2000 psi.	Fair to Poor Vinyl elasticity is limited and varies from brand to brand. Typical elongation limit is less than 500%. The film exhibits limited memory.	Poor Vinyl is easily punctured by sharp objects.	Fair Low elasticity limits fit and comfort for many users. The wrist diameter is usually very large making the glove baggy around the cuff.	Fair Offers less protection than the other polymer materials.	Very Good Vinyl costs are typically similar to those of latex. Vinyl is a low-cost alternative.	This is for layout purposes only and not meant to be read for content.	Poor Does not decompose in landfills. The plasticizers in vinyl are hormone mimics; if they leach out into the environment, they can have significant impact on wildlife. Incineration produces significant amounts of hydrochloric acid.

For more information on these products or for information regarding latex allergies and other educational materials, contact your Ansell Clinical Consultant or your Ansell Account Manager.

*When used within accordance with published guideline.