American Latex Allergy Association

Selecting Surgical Gloves

Milt Hinsch?Technical Services Director, Regent Medical
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Appropriate surgical glove selection necessitates thorough education and knowledge about available gloves and materials. Selecting surgical gloves today depends on many different factors which vary from practitioner to practitioner and facility to facility. A few of these are enumerated:

- What type of surgery is being performed?
- Will a thin, smooth glove be most appropriate, or does the procedure require a thicker, textured glove?
- If a procedure is rigorous or high-risk, should one double-glove?
- Are surgical staff members or patients allergic to natural rubber latex (NRL)?

Natural rubber latex gloves (NRL) remain the gold standard to which all other glove materials are compared. They provide excellent barrier protection against small viral penetration such as hepatitis B,C and HIV as well as against the many resistant bacteria which present clinical challenges today. The strengths of the NRL glove are familiar and they:

- are a renewable source
- are comfortable (flexible, elastic)
- can be incinerated
- have some self-sealing properties
- form a microbial barrier
- are chemically resistant to many common medical and hospital chemicals
- serve as electrical insulation
- are ideal for double gloving
- have low odor
- are durable
- can be manufactured with low extractable protein and low chemical content
- are held to higher American Society for Testing and Materials (ASTM) requirements than are synthetic gloves

Contrasted with these are synthetic gloves. Current figures show that 90% of surgical and 76% of examination gloves are made of NRL but synthetic is slowly gaining in popularity. While a change to synthetic certainly protects against NRL allergy, there is not a lot of information about reactions to chemicals used to produce these gloves. Some synthetics are made with the same chemicals that are used to manufacture NRL, so the change may not result in clinical improvement. The most common synthetic materials on the market today are:

- polyvinyl chloride (PVC or vinyl)
- butadiene-acrylonitrile (nitrile)
- polycholoroprene
- styrene-butadiene rubber (SBR)
- styrene-ethylene-butadiene-styrene (SEBS)
- polyurethane (PU)

Polyvinyl chloride

While PVC represents approximately 23% of the exam glove market, it is not used for surgical gloves because of its lack of elasticity and poor barrier qualities.

Butadiene-acrylonitrile

Nitrile is relatively new on the market and is a growing segment of the exam glove market. It is an alternative for those with a NRL allergy and has a wide range of chemical resistance (although these chemicals are different from those to which NRL is resistant). There are a few studies that show nitrile has a failure rate of 1%-3% for holes and tears compared to 0%-4% for NRL.

Polychloroprene

Polychloroprene?s estimated share of the surgical glove market is 2% and it is an alternative for those with NRL allergy. It is similar to NRL in its ability to serve as an electrical insulator and is resistant to many chemicals. It offers good protection and is less permeable to alcohols than NRL or vinyl.

Styrene-butadiene rubber, styrene-ethylene-butadiene-styrene, and polyurethane

Gloves made from these are relatively new to the surgical glove market. They are an alternative to one with NRL allergy. These products are held to a lower standard than NRL and their tensile strength is lower than NRL. SBR gloves are affected by ozone and disintegrate in contact with uncured methylmethacrylate (bone cement), as do SEBS. Current PU gloves feel slippery in comparison to NRL and they dissolve in the presence of common alcohols.

Glove use in the United States steadily increased after implementation of Universal Precautions, with 22 billion gloves in 1997. The FDA estimates that by 2007 that number will increase to 32 billion gloves and the powder-free segment will increase seven-fold. In considering a change to synthetic gloves, one should bear in mind that these gloves are not without risk as to allergy or reaction because of the chemicals used in the manufacturing process.

Finally, regarding powder-free gloves, one should consider that starch powder may cause wound healing issues, post-operative complications, misdiagnosis and facilitate latex allergy exposure. In spite of this data, powdered

gloves continue to make up the majority of medical gloves worn in the U.S. The powder-free segment is growing and numerous professional health care organizations have issued protocols and position statements supporting the use of powder-free, low allergen NRL gloves.

In conclusion, know what you are looking for in a surgical glove. They should provide:

- durability
- a barrier to viruses and other pathogens
- powder-free donnability
- low extractable latex proteins (if latex)
- low residual chemicals
- sterility
- ability to easily don with wet or dry hands
- a sure grip
- gentleness to the skin
- right and left hand specificity
- comfort
- sensitivity

This summary of a published scientific paper has been compiled by Carolyn Twomey, Clinical Nurse Consultant, Regent Medical as a service to healthcare professionals. It does not contain the complete text, and Regent Medical makes no representation as to its completeness in addressing all issues in the paper. A reprint of the original paper may be obtained through Regent Medical by Email or direct from the publishers of the journal in which it appeared.

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American Latex Allergy Association

P.O. Box 198
Slinger, WI 53086
Phone: 262-677-9707 1-888-97-ALERT
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