

EXPOSURE:

Specialty

Durability Challenge

- High risk of contact with bloodborne pathogens or other potentially infectious materials
- Greater than normal physical or chemical challenges
- Chemotherapy procedures[†]

Examples

- X-ray procedures
- Handling hazardous chemicals[†]
- Preparing and administering chemotherapeutic agents[†]
- Surgical instrument decontamination and cleaning

Glove Selection

Sterile or non-sterile, standard or extended length:

- Natural Rubber Latex (NRL)
- Nitrile
- Others may qualify

[†] Obtain appropriate test data and/or FDA clearance from the manufacturer.

[‡] Ask manufacturer for information regarding resistance to specific chemicals.



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Durability Needs Assessment for Medical Gloves



Recommended areas and tasks are based on feedback from a research panel of 300 Registered Nurses, Infection Preventionists, and Materials Managers. Ultimately, health care personnel must make the final decision on which level of glove protection is appropriate given the anticipated risk of fluid exposure.

EXPOSURE:**Low****Durability Challenge**

- Little to no risk of contact with bloodborne pathogens or other potentially infectious materials
- Contact with intact skin of patient
- Chemicals contacted are not harmful and do not break down the glove material
- Low levels of twisting, abrasion, or other glove stress
- Short-term use
- General housekeeping

Examples

- Food handling
- Routine oral exams
- Transporting patients
- Specimen container transport
- Dispensing general medications
- Non-invasive general physical examinations

Glove Selection

Non-Sterile:

- Nitrile
- Vinyl

Studies

| Author | Date | Durability Challenge (|
|-------------------------|------|------------------------|
| Kerr ¹ | 2004 | X(c) X(d) |
| Kerr ² | 2002 | X |
| Korniewicz ³ | 2002 | X |
| Rego ⁴ | 1999 | X(e) X(f) |

EXPOSURE:**Moderate****Durability Challenge**

- Some risk of contact with bloodborne pathogens or other potentially infectious materials
- Twisting, torquing, abrasion, snagging
- No immersion in potentially harmful chemicals[†]

Examples

- Ostomy care
- Dental fillings
- Dental cleaning
- Staple removal
- Starting or changing IVs
- Endotracheal suctioning
- Oral care of ventilated patients
- Gastrointestinal/Gastrourinary procedures
- Changing contaminated or soiled linen or clothing

Glove Selection

Sterile or non-sterile:

- Natural Rubber Latex (NRL)
- Nitrile
- Neoprene and polyurethane may be appropriate

† Ask manufacturer for information regarding resistance to specific chemicals.

| a) | Leakage Percentage Rates (b) | | | | |
|----|------------------------------|---------------|-------------|---------|-------------|
| | Standard Vinyl | Stretch Vinyl | Latex (NRL) | Nitrile | Chloroprene |
| | 33.0% | | 9.2% | 5.5% | 3.0% |
| | 35.5% | | 9.0% | 7.5% | 8.0% |
| | 35.0% | | 9.0% | | |
| | 8.2% | | 2.2% | 1.3% | |
| | 43.5% | 16.0% | 2.0% | 2.0% | |
| | | | 0.0% | | |

(a) Simulated use

(b) When more than one brand of a particular material was evaluated, failure rates were averaged

(c) Glove Durability Method

(d) Simulated Clinical Method

(e) Powdered latex

(f) Powder-free latex

EXPOSURE:

High



Durability Challenge

- High risk of contact with bloodborne pathogens or other potentially infectious materials
- Greater than normal physical or chemical challenges
- Highly infectious agents
- Extremely long procedures
- Contact with sharps, wires, bone fragments, etc.

Examples

- Root canal
- Tooth extraction
- Handling liquid sterilants and harsh disinfectants
- Contact with bone fragments, wires, sharp objects

Glove Selection

Sterile or non-sterile:

- Natural Rubber Latex (NRL)
- Nitrile
- Neoprene
- Others may qualify

1. Kerr LN, Chaput MP, Cash LD, et al. 2004 Sep. Assessment of the Durability of Medical Examination Gloves. *Journal of Occupational and Environmental Hygiene* 1: 607-612.

A 10 minute glove durability test was performed on vinyl, latex, nitrile and chloroprene examination gloves after which leak rates were determined. Failure rates: 42% powder-free vinyl, 24% powdered vinyl, 11% powder-free latex, 12% powder-free, textured latex, 9% polymer coated, powder-free, textured latex, 8% powdered latex, 6% powdered, textured latex, 3% powder-free, textured chloroprene, 5% powder-free, textured nitrile, 6% powder-free nitrile.

A 12 minute simulated use study was performed on vinyl, latex, nitrile and chloroprene examination gloves after which leak rates were determined. Failure rates: 38% powder-free vinyl, 33% powdered vinyl, 4% powder-free latex, 5% powder-free, textured latex, 10% polymer coated, powder-free, textured latex, 17% powdered latex, 9% powdered, textured latex, 8% powder-free, textured chloroprene, 12% powder-free, textured nitrile, 12% powder-free nitrile. The majority of the defects were located in the finger regions of the gloves.

2. Kerr LN, Boivin WS, Chaput MP, et al. 2002 Sep. The Effect of Simulated Clinical Use on Vinyl and Latex Exam Glove Durability. *Journal of Testing and Evaluation* 30(5): 415-420.

A 12 minute simulated use study was performed on 100 vinyl and 100 latex gloves by ten analysts after which leak rates were determined. Failure rates: 35% vinyl, 9% latex.

3. Korniewicz DM, El-Masri M, Broyles JM, et al. 2002 Apr. Performance of Latex and Nonlatex Medical Examination Gloves during Simulated Use. *American Journal of Infection Control*, 30(2): 133-8.

1,988 vinyl, 1,006 vinyl/copolymer (base material is vinyl), 1,052 latex and 1,464 nitrile gloves were worn during a simulated use study. Failure rates: 8.2% vinyl and vinyl/copolymer, 2.2% latex and 1.3% nitrile.

4. Rego A, Roley L. 1999 Oct. In-Use Barrier Integrity of Gloves: Latex and Nitrile Superior to Vinyl. *American Journal of Infection Control* 27(5): 405-410.

400 vinyl, 300 powdered latex, 100 powder-free latex and 200 nitrile gloves were evaluated for leaks after simulated use activities. Failure rates: 26-61% standard vinyl, 12-20% stretch vinyl, 2.3% powdered latex, 0% powder-free latex, 2% nitrile.