



Sustainable Hospitals Program

A Project of the Lowell Center for Sustainable Production, University of Massachusetts Lowell

Questions to Ask When Selecting Medical Gloves for Handling Chemotherapy Drugs

What to Ask Yourself

The starting point, and the most important point, for selecting any type of protective glove is to define:

Who is being protected? **What** is being protected against?

Medical gloves are typically used to protect clinicians from a range of hazards encountered in the workplace, including:

- Biological exposures (bacterial and viral)
- Chemotherapy drugs
- Sterilants
- Hazardous chemicals

To ensure that a glove provides the proper protection, you must know **who** is being protected and exactly **what** they may be exposed to and must be protected against. For **chemotherapy drugs**, different staff members may be exposed to the drugs during preparation, administration, disposal or cleaning up an unintentional spill. It is important to know what chemotherapy drugs are being used in your hospital and the nature of the job tasks (including the length of time the glove will be worn) during which exposure might occur. With this basic knowledge, you can then talk to manufacturers and determine which gloves can provide an appropriate barrier.

Chemotherapy Gloves: What to Ask Manufacturers

In addition to other criteria routinely used for selecting gloves, your selection process for chemotherapy gloves must **verify that the glove provides barrier protection against the chemotherapy drugs** that might be encountered in your workplace. The FDA does not require manufacturers to test permeation resistance of their gloves to chemotherapy drugs, but some manufacturers voluntarily perform this important testing. There are two standard test methods that manufacturers may use for evaluating the resistance of gloves to permeation by chemotherapy drugs:

- ASTM D6978* is a new test method (as of Summer 2005) specifically designed to test a medical glove's barrier resistance to 10 different chemotherapy drugs. (It is the more stringent of these two tests).
- ASTM F739* is an older and more general test method used by some manufacturers to evaluate their protective clothing materials as a barrier to chemicals, including chemotherapy drugs.

Ideally, gloves will be tested using ASTM D6978, the newer and more stringent method. In the short term, however, it may be necessary to evaluate gloves using data obtained per the ASTM F739 test method.

Contact the glove manufacturer(s) and ask if they have tested their gloves using ASTM D6978-05. If they have done this testing, ask for a copy of the lab's test results for the glove being

considered. (Manufacturers typically hire an independent laboratory to perform the glove testing, using the ASTM standard procedure). If the company has not tested their gloves per this procedure, ask for the results of their ASTM F739 testing for each of the chemotherapy drugs your department uses. (This is the older test protocol and a number of companies have tested their gloves using this protocol for common chemotherapy drugs).

The result of either test will be reported as "break-through time", or the time it takes for the chemical to permeate from the outer surface of the glove to the inside surface. (Higher break-through time is better). For either D6978 or F739 results, look at the break-through time and compare it with the time that your clinician will be wearing the gloves. The break-through time should be much, much longer than the glove wear time to ensure adequate protection. If an adequate break through time cannot be found, keep looking for a more protective glove. As a last resort, gloves may have to be changed during the medical procedure to ensure adequate protection.

If the manufacturer hasn't yet tested their gloves using ASTM D6978, let them know that you want and expect them to do that testing in a timely manner.

Summary

1. Define who is being protected and what they are being protected against. Be knowledgeable about the work tasks and the length of time the gloves will be worn.
2. Ask manufacturers to provide test results showing the barrier resistance of their gloves to chemotherapy drugs. Ideally, gloves should be tested using the standard test method ASTM D6978. However, because this is a new test method (Summer 2005), for the short term it may be necessary to accept testing results from ASTM F739.
3. For each of the chemotherapy drugs used in your facility, look at the "break-through time" (ASTM test result). This tells the length of time it took for the drug to permeate from the outside of the glove to the inside. Make sure that this break through time is much, much longer the length of time your clinicians will be wearing the gloves while they handle the chemotherapy drug. (If an adequate break through time cannot be found, clinicians should use a more protective glove or as a last resort, change gloves during the procedure).

*Note: ASTM International, originally known as the American Society for Testing and Materials (ASTM), develops voluntary technical standards for materials, products and services. An ASTM standard, such as ASTM F739 or D6978, is a test method which manufacturers may use to evaluate the performance of their products or materials. The full titles of the 2 test methods referenced in this fact sheet are:

- D6978-05 Standard Practice for Assessment of Resistance of Medical Gloves to Permeation by Chemotherapy Drugs
- F739-99a Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Continuous Contact

For more information on medical gloves, visit the Sustainable Hospitals Website at www.sustainablehospitals.org or contact the Sustainable Hospitals Program by email (shp@uml.edu) or phone (978-934-3386).