657—13.24(124,155A) Sterilization methods. The selected sterilization method employed shall be based on experience and appropriate information sources.

13.24(1) *Presterilization requirements for high-risk preparations.*

a. During all compounding activities that precede terminal sterilization, such as weighing and mixing, compounding personnel shall be garbed and gloved in the same manner as when performing compounding in an ISO Class 5 environment. All presterilization procedures shall be completed in an ISO Class 8 or superior environment.

b. Immediately before use, all nonsterile measuring, mixing, and purifying devices used in the compounding process shall be thoroughly rinsed with sterile, pyrogen-free water, and then thoroughly drained or dried.

13.24(2) *Sterilization methods for high-risk preparations.*

a. Sterilization by filtration. This method of sterilization involves the passage of a fluid or solution through a sterilizing grade membrane to produce a sterile effluent.

(1) Sterile filters used to sterile filter preparations shall be pyrogen-free and have a nominal porosity of 0.22 microns. The filter dimensions and liquid material to be sterile filtered shall permit the sterilization process to be completed rapidly without the replacement of the filter during the filtering process.

(2) Compounding personnel shall ascertain that selected filters will achieve sterilization of the specific preparation.

(3) Sterilization by filtration shall be performed entirely within an ISO Class 5 or superior air quality environment.

b. Terminal sterilization. Use of saturated steam under pressure, or autoclaving, is the preferred method to terminally sterilize aqueous preparations.

(1) All materials shall be exposed to steam at 121 degrees Celsius under the recommended pressure and duration, verified by testing the sterility of the finished preparation.

(2) The description of steam sterilization conditions and duration for specific preparations shall be included in written documentation maintained in the compounding facility.

(3) Before or during entry into final containers, all high-risk preparations in solution form that are subjected to terminal steam sterilization shall pass through a filter with nominal porosity not larger than 1.2 microns for removal of particulate matter.

c. Dry heat sterilization. Dry heat sterilization shall be completed in an oven designed for sterilization and shall be used only for those materials that cannot be sterilized by steam. The effectiveness of dry heat sterilization shall be verified using appropriate biological indicators and temperature-sensing devices.

13.24(3) *Records.* Record requirements for high-risk preparations shall include documentation of the following:

a. Lot numbers of nonsterile components used in compounding high-risk preparations.

b. Sterilization records including methods used for each preparation.

13.24(4) *Testing and quarantine requirements.* All high-risk preparations that are prepared in groups of 25 or more identical single-dose containers or in multiple-dose vials for administration to multiple patients, or that are exposed longer than 12 hours at 2 to 8 degrees Celsius and longer than 6 hours at warmer than 8 degrees Celsius, shall be quarantined and tested to ensure that the preparations are sterile before they are dispensed or administered.

13.24(5) *Release of preparations prior to receipt of testing results.* If a preparation may be needed before the results of sterility testing have been received, the pharmacy shall have a written procedure requiring daily observation of incubating test specimens and immediate recall of the dispensed preparations when there is any evidence of microbial growth in the test specimens.

13.24(6) *Bacterial endotoxin (pyrogen) testing.* All high-risk preparations, except those for inhalation and ophthalmic administration, that are prepared in groups of more than 25 identical individual single-dose containers, or in multiple-dose vials for administration to multiple patients, or that are exposed longer than 12 hours at 2 to 8 degrees Celsius and longer than 6 hours at warmer than 8

degrees Celsius before they are sterilized, shall be tested to ensure that the preparations do not contain excessive bacterial endotoxins.