Some patients cannot use MDIs properly. Thus, after a new prescription is dispensed, it is advisable for the pharmacist to follow up with the patient to make sure the patient can use the inhaler. If the patient cannot use the inhaler, it is advisable for the pharmacist to recommend to the patient or the patient's physician the use of an extender device with the inhaler. Extender devices, or spacers, were originally developed for patients who could not learn to coordinate release of the medication with inhalation. These are now considered an important therapeutic aid because they can effectively assist the delivery of medication despite improper patient inhalation technique. By placing an extender device between the MDI's mouthpiece and the patient's mouth, the patient is permitted to separate activation of the aerosol from inhalation by up to 3 to 5 seconds (a valve in the spacer opens when the patient inhales). Another advantage of the extender is that aerosol velocity is reduced and droplet size is decreased because there is time for evaporation of the fluorohydrocarbon propellant. Thus, extender devices also cause less deposition of medication in the oropharynx. Extender devices can be used with most pressurized canisters, such as Brethancer Inhaler (Novartis) and InspirEase (Key).

To ensure continuity of therapy, it is wise for the pharmacist to share with the patient ways to assess how much medication is left in the canister. This is important to ensure continuity of therapy, especially for those who have respiratory illness and may need their medication on a moment's notice.

Examples of oral *inhalation aerosols* (solutions and powders) include Asmanex Twisthaler (mometasone furoate inhalation powder, Schering), Ventavis (iloprost inhalation solution, Cotherix), Pulmicort Flexhaler (budesonide inhalation powder, AstraZeneca), Atrovent HFA (ipratropium bromide HFA inhalation aerosol, Boehringer Ingelheim), and Brovana (arformoterol tartrate inhalation solution, Sepracor Inc.).

For topical administration of aerosol dosage forms, the patient should first clean the affected area gently and pat it dry. Holding the canister with the nozzle pointing toward the body area and about 6 to 8 inch away, the patient should press down the button to deliver enough medication to cover the area. The patient should allow the spray to dry and not cover the area with a bandage or dressing unless instructed to do so by the physician. The patient should avoid accidentally spraying the product into the eyes or mouth. If it is necessary to apply the product to a facial area, the patient should spray the product into the palm of the hand and apply it by this means.

As presented in Table 14.6, a number of drug substances are administered through pressure-packaged inhalation aerosols like the type shown in Figure 14.14. For the inhaled drug substance or solution to reach the bronchial tree, the inhaled particles must be just a few microns in size.

Topical Aerosols

Convenient aerosol packages for use on the skin include the anti-infective agents povidone iodine, tolnaftate, and thimerosal; the adrenocortical steroids betamethasone dipropionate and valerate, dexamethasone, and triamcinolone acetonide; and the local anesthetic dibucaine hydrochloride.

The use of topical aerosols provides the patient a means of applying the drug in a convenient manner. The preparation may be applied to the desired surface area without the use of the fingertips, making the procedure less messy than with most other types of topical preparations. Among the disadvantages to the use of topical aerosols are the difficulty in applying the medication to a small area and the greater expense associated with the aerosol package.

Vaginal and Rectal Aerosols

Aerosol foams containing estrogenic substances and contraceptive agents are commercially available. The foams are used intravaginally in the same manner as for creams. The aerosol package contains an inserter that is filled with foam and the contents placed in the vagina through activation of the plunger. The foams are generally o/w