

1-mL tuberculin syringe can also be used if the lower portion of the barrel is cut off (a pencil sharpener works well for this). The urethral suppository can be removed from the syringe barrel by inserting the plunger and forcing out the suppository after slight warming. A large diameter needle, attached to the syringe filled with the suppository melt, will aid in transferring the product into the 1-mL tuberculin syringe.

The MUSE (alprostadil) urethral micro-suppository (Vivus, Inc.) is a single-use medicated transurethral system for the delivery of alprostadil to the male urethra. The drug is suspended in a polyethylene glycol 1450 excipient and is formed into a medicated pellet, or microsuppository, measuring 1.4 mm in diameter and 3 or 6 mm in length. Available strengths are 125, 250, 500, and 1,000 μg . The microsuppository resides in the tip of a translucent hollow applicator. It is administered by inserting the applicator tip into the urethra after urination. The pellet is delivered by depressing the applicator button. The polyethylene glycol 1450 vehicle will dissolve in the available fluid, releasing the drug for absorption. The applicator system is composed of medical grade polypropylene; each system is individually foil packaged. The MUSE microsuppository is indicated for the treatment of erectile dysfunction.

VAGINAL INSERTS

Examples of vaginal inserts (which includes vaginal tablets) are presented in Table 12.2. These preparations are employed principally to combat infections in the female genitourinary tract, to restore the vaginal mucosa to its normal state, and for contraception. The usual pathogenic organisms are *T. vaginalis*, *C. (Monilia) albicans* or other species, and *Haemophilus vaginalis*. Among the anti-infective agents in commercial vaginal preparations are nystatin, clotrimazole, butoconazole nitrate, terconazole, and miconazole (antifungals) and triple sulfas, sulfanilamide, povidone iodine, clindamycin phosphate, metronidazole, and oxytetracycline

(antibacterials). Nonoxynol-9, a spermicide, is employed for vaginal contraception. Estrogenic substances such as dienestrol are found in vaginal preparations to restore the vaginal mucosa to its normal state.

The most commonly used base for vaginal inserts consists of combinations of the various molecular weight polyethylene glycols. To this base is frequently added surfactants and preservative agents, commonly the parabens. Many vaginal inserts and other types of vaginal dosage forms are buffered to an acid pH usually about 4.5, consistent with the normal vagina. This acidity discourages pathogenic organisms and provides a favorable environment for eventual recolonization by the acid-producing bacilli normally found in the vagina.

The polyethylene glycol-based vaginal suppositories are water miscible and are generally sufficiently firm for the patient to handle and insert without great difficulty. However, to make the task easier, many manufacturers provide plastic insertion devices that are used to hold the suppository or tablet for proper placement within the vagina (Fig. 12.5).

As noted earlier, pharmacists frequently are called on to prepare progesterone vaginal suppositories. Formulas for extemporaneous preparation of these suppositories have been presented in the professional literature. Micronized progesterone powder is used in



FIGURE 12.5 Dosage forms used intravaginally, including suppositories (top and middle), vaginal inserts packaged in foil (bottom), vaginal cream, and corresponding insert devices.