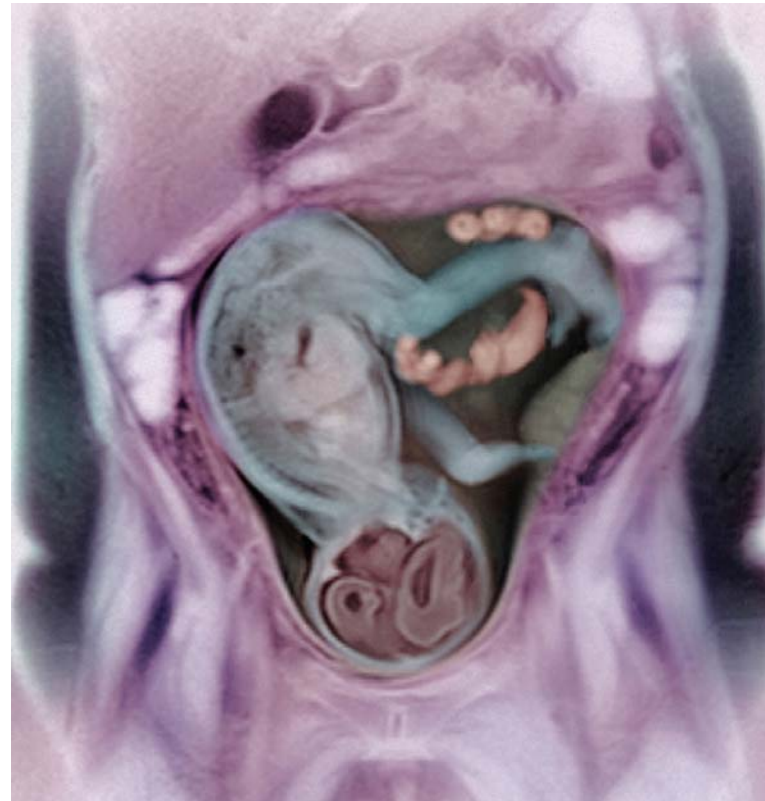


Chapter 28

Lactation / Contraceptive Devices / Sexual Transmitted Diseases



Lactation

- **lactation** – the synthesis and ejection of milk from the mammary glands
 - lasts as little as a week in women who do not breast-feed their infants
 - can continue for many years as long as the breast is stimulated by a nursing infant or a mechanical device (**breast pump**)
 - women traditionally nurse their infants until a median age of about **2.8 years**

Mammary Gland Development

- high estrogen level in pregnancy causes the ducts of the mammary glands to grow and branch extensively
- **growth hormone, insulin, glucocorticoids,** and **prolactin** contribute to this development
- **progesterone** stimulates the budding and development of acini at the end of the ducts
- acini organized into grape-like clusters (**lobules**) within each breast lobe

Colostrum and Milk Synthesis

- **colostrum** forms in late pregnancy
 - similar to breast milk in protein and lactose, but contains 1/3 less fat
 - first 1 to 3 days after birth
 - thin watery consistency and a cloudy yellow color
 - contains IgA to protection the baby from gastroenteritis
- **prolactin** (from anterior pituitary) promotes milk synthesis
 - inhibited by dopamine when not pregnant
 - synthesis of hormone begins 5 weeks into pregnancy, by full term it is 10 to 20 times normal level
 - little effect on mammary glands until after birth
 - steroid hormones from placenta oppose prolactin until birth
 - milk synthesis also requires growth hormone, cortisol, insulin, and parathyroid hormone to mobilize necessary amino acids, fatty acids, glucose, and calcium

Colostrum and Milk Synthesis

- at birth, prolactin secretion drops to nonpregnancy levels
- every time the infant nurses prolactin levels jump to 10 to 20 times this level for the next hour
 - stimulates the synthesis of milk for the next feeding
 - without nursing, milk production stops in 1 week
- only 5-10% of women become pregnant while breast-feeding
 - inhibition of GnRH and reduced ovarian cycling
 - natural means of spacing births

Prolactin and Lactation

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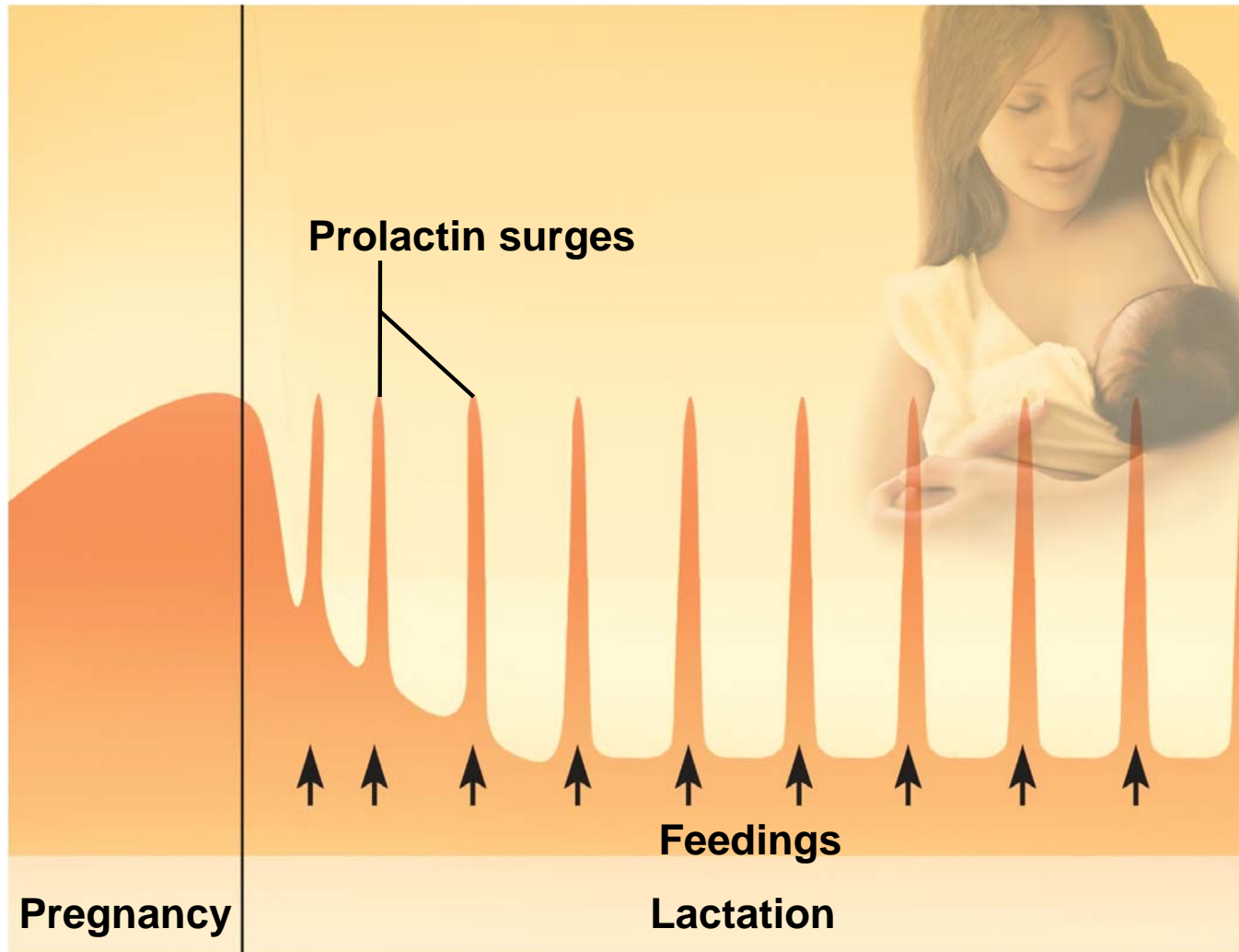


Figure 28.22

Milk Ejection

- milk is continually secreted into the mammary acini, but does not easily flow into the ducts
- **milk ejection** (letdown) is controlled by a **neuroendocrine reflex**
 - infant's suckling stimulates sensory receptors in nipple, signaling hypothalamus and posterior pituitary to release oxytocin
 - **oxytocin** stimulates **myoepithelial cells** around each acinus
 - contract to squeeze milk into duct
 - milk flow within 30-60 seconds after suckling begins

Breast Milk

- breast milk changes composition over the first two weeks
 - varies from one time of day to another
 - at the end of a feeding there is less lactose and protein, but six times the fat
- cow's milk not a good substitute
 - 1/3 less lactose but 3 times as much protein
 - harder to digest and more nitrogenous waste (diaper rash)
- colostrum and milk have a laxative effect that clears intestine of **meconium** (green, bile-filled fecal material in newborn)
- supplies antibodies and colonizes intestine with beneficial bacteria
- nursing woman can produce 1.5L per day

Contraceptive Devices

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Male condom



Female condom



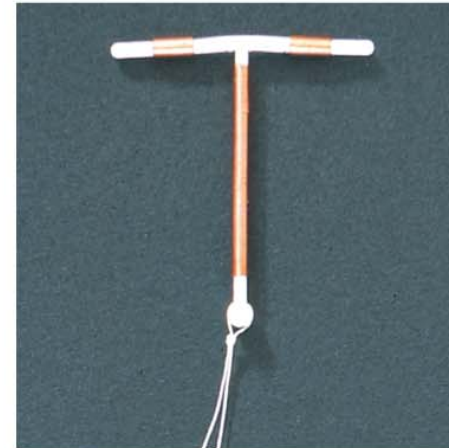
Diaphragm with contraceptive jelly



Contraceptive foam with vaginal applicator



Birth-control pills



Intrauterine device (IUD)

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Methods of Contraception

- **contraception** - any procedure or device intended to prevent pregnancy
- **behavioral methods**
 - abstinence
 - rhythm method (periodic abstinence)
 - withdrawal (coitus interruptus)
- **barrier and spermicidal methods** // male and female condom, diaphragm, sponge
- **hormonal methods**
 - “the pill”, patch, injection or vaginal ring - ovarian follicles do not mature
 - “morning after pills” – induces menstruation providing implantation has not occurred
 - RU-486 – induces abortion up to 2 months into pregnancy
- **preventing implantation** // intrauterine device (IUD)
- **surgical sterilization** // clamping or cutting the genital ducts (uterine tubes or ductus deferens)

Sexually Transmitted Diseases

- STDs have an **incubation period** in which the pathogen multiplies with no symptoms and a **communicable period** in which the disease can be transmitted to others // symptomless carriers do exist
- **bacterial STDs**
 - **chlamydia** – may cause urethral discharge and testicular pain
 - **gonorrhea** – pain and pus discharge – may result in sterility from pelvic inflammatory disease
 - **sypphilis** – hard lesions (chancres) at site of infection
 - disappearance of chancres ends first stage
 - second stage is widespread pink rash
 - neurosyphilis is third stage with cardiovascular damage and brain lesions
- **viral STDs**
 - **genital herpes** – most common STD in US
 - blisters and pain
 - **genital warts** – warts on perineal region, cervix, anus
 - **hepatitis B and C** – inflammatory liver disease