

Pathophysiology of the Breast

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The human breast develops as a series of thickenings along the mammary ridge (or milk line) extending from axilla to groin. The caudal two thirds of these thickenings disappears in humans, leaving a single pectoral thickening bilaterally that becomes the primitive breast. Extra or supernumerary breasts are rare. More commonly, extra nipples occur along the mammary ridge, usually on the inferior aspect of the breast or on the chest wall ([Bland](#)).

Milk line extending from axilla to groin. From Bates B: *A guide to physical examination and history taking*, ed 6, Philadelphia, 1995, Lippincott-Raven.

Normal breast: structure, function, and epidemiology. From [Powell](#).

The female breast remains essentially dormant until puberty. During adolescence girls develop breast buds in response to the increased levels of follicle-stimulating hormone and luteinizing hormone. The areola elevates and ducts begin to elongate and branch while fibrous tissue is laid down. Lobule formation is dependent on ovulation. In young adulthood the breast has multiple lobes, each with a main branching duct and supported by fibrous tissue ([Osuch](#)). The ducts behind the areola dilate and form sinuses that can be palpated as bumps beneath the areola on CBE. The areola develops raised glands, Montgomery's tubercles, which lubricate the nipple during lactation ([Osuch](#)). During pregnancy the breast lobules proliferate and undergo further maturation and breast size increases. The nipple and areola become more darkly pigmented. Further into pregnancy the lobular cells become distended with colostrum. Several days before delivery, lactation is stimulated by high levels of prolactin and placental hormones. After breast feeding stops, the lobules regress and the breast slowly returns to a mature resting state. The ductal tree remains intact.

A. Adolescence, B. Pregnancy, C. Lactation, and D. Post-menopausal period. From Bland KI, Copeland EM: Breast. In Schwartz SI, Shires GT et al, eds: *Principles of surgery*, ed 6, New York, 1994, McGraw-Hill. In the postmenopausal breast, both the ductal structures and the lobular structures slowly recede and are replaced by adipose tissue. Some lobules remain, but they are small and scattered within the adipose tissue. CBE in postmenopausal women is easier to interpret because of this reduced nodularity. Of note, in postmenopausal women taking hormone replacement therapy the breast structure may return to a more premenopausal appearance ([Osuch](#)).