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## Facing up with acne

The prevalence of the acne is widespread, affecting 80% of the population between the ages of 12 and 30. Although acne is generally self-limiting, the psychological effect may be profound. Causes of acne are multifactorial and not completely understood.

Formation of a primary acne lesion, the comedo (or comedone) may be thought of simplistically as a plugging of the sebaceous follicle. As a result, the follicular canal widens and cell production is increased. Sebaceous glands may atrophy and sebum generally combines with excess loose cells in the follicular canal to form a keratinous plug. This lesion clinically appears as a "blackhead" or open comedo. Trauma or inflammatory changes in this lesion may lead to formation of a "whitehead" or closed comedo. If the follicular wall is damaged or ruptured by trauma or irritation, contents of the follicle wall may extrude into the dermis and initiate an inflammatory reaction clinically defined as a pustule or cyst, commonly referred to as "pimples" or "zits"

Androgens stimulate growth of sebaceous follicles and enhance sebum production. During the second decade of life, sebum production parallels androgen production and the presence of acne. Increased secretion of sebum into follicles also correlates with severity of acne. The glyceride component of sebum is converted by lipases to glycerol and free fatty acids which presumably irritate the follicular wall and cause increased cell turnover and inflammation. This explanation perhaps is an oversimplification as glycerol has been identified as a substrate for the bacteria usually *P. acnes* and free fatty acids act as a measure of *P. acnes* activity and viability, hence *P. acnes* may activate the complement cascade via classic and alternative pathways leading to vascular leakage, mast cell degranulation, leukocyte and neutrophil chemotaxis leading to direct tissue damage.

Clinically, acne can be mild and involved only a few open comedones, or it can be severe and involve multiple inflamed cysts, nodules, and pustules. Although these acne lesions may take as long as a month to develop and three to six weeks to completely heal, the fibrosis that accompanies healing may lead to permanent scarring. Severe forms of acne may be persistent and require advanced treatment. There is no "cure" for acne, however, aggressive therapy may modify or halt progression, and thereby prevent scarring.

### Treatment of Acne

**General Treatment.** Daily washing, with ordinary facial soaps, usually is a satisfactory method for removing excess sebum from skin. Antibacterial or "medicated" soaps offer very little additional benefit. Commonly available "anti-acne" soaps or cleansers containing salicylic acid, sulfur, or resorcinol are rarely considered effective and are washed away by rinsing. Abradant cleansers containing finely divided particles with cleansers and wetting agents are very popular and thought to assist removal of the outer layer of dead skin cells by abrasion, exfoliation, and loosening of comedones. These abradants, often an additional source of injury to inflamed skin, are ineffective at removing deeply rooted comedones, and are generally not recommended.

Heat and humidity, sunlight, friction, occlusion, pressure from athletic equipment, cosmetics, moisturizers, sunscreens, and stress are all capable of aggravating acne. Water-based cosmetics may be recommended to acne-prone patients since "oil-free" formulations may contain other oil-like substances capable of producing "acne cosmetica" by follicular occlusion.

**Benzoyl peroxide.** Although it improves 50% to 75% of cases of acne, its exact mechanism of action in acne is uncertain. When benzoyl peroxide is decomposed in the skin by cysteine, it liberates free oxygen radicals that oxidize bacterial proteins. This bactericidal action of benzoyl peroxide on *P. acnes* decreases the production of irritating fatty acids in sebum caused by this organism. Benzoyl peroxide also is a primary irritant that increases the sloughing rate of epithelial cells and loosens the follicular plug structure, thereby exerting a "comedolytic" effect.



**Tretinoin (Retin-A).** Tretinoin has unique mechanisms of action compared to other anti-acne agents. Tretinoin increases follicle wall cell turnover and decreases cohesiveness of cell; as a result, existing comedones are extruded and the formation of new comedones is inhibited. Thus, this drug is very effective in removing "blackheads". Tretinoin also increases the susceptibility to irritation from wind, cold, dryness, and sunlight, all of which should be avoided as much as possible.

**Isotretinoin**, a derivative of vitamin A is a pharmacologically unique agent indicated for patients with severe cystic acne unresponsive to conventional therapy. The drug inhibits sebum production, decreases sebaceous glands size, reduces the number of *P. acnes* within follicles, and normalizes the keratinization process. The bioavailability of isotretinoin is increased when taken with food. Side effects with isotretinoin are significant. Cheilitis (i.e. chapped, peeling lips) affect 90% of patients. Facial skin desquamation secondary to isotretinoin affects about 30% of patients. Conjunctivitis and/or eye irritation accounts for more than 50% incidence. Corneal opacities and decreased night visions have also been reported in patients taking isotretinoin for cystic acne.

*Noncomedogenic emollients or 1% hydrocortisone cream may be helpful in managing these particular adverse reactions.*

**Antibiotics.** Tetracycline, like other systemic antibiotics, significantly decreases the percentage of free fatty acids in skin, decreases the population of *P. acnes*, and inhibits leukocyte chemotaxis. Unlike other antibiotics, tetracycline concentrates in cells of inflamed skin more than in normal skin. Tetracycline also reduces the production of keratin in sebaceous follicles and inhibits phagocytosis as well as complement activation by the alternate pathway. Tetracycline is considered to be the systemic antibiotic of choice for acne because of its beneficial actions, relatively low cost, and low incidence of side effects despite long-term use. Other systemic antibiotics proven to be effective for acne include; erythromycin, clindamycin, cotrimoxazole, doxycycline, and minocycline.

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