



Pediatric Clinic

ACNE

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Patient information: Acne (Beyond the Basics)

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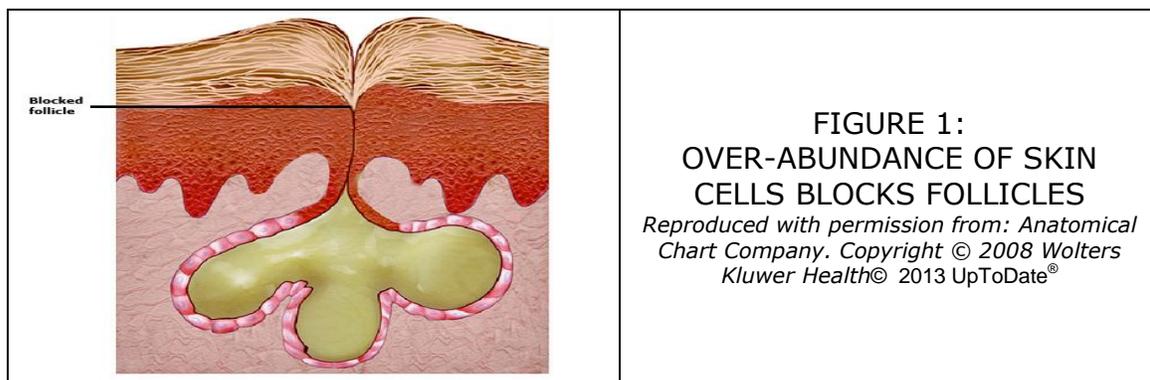
Disclosures: All topics are updated as new evidence becomes available and our [peer review process](#) is complete.

Literature review current through: Apr 2013. | **This topic last updated:** May 15, 2013.

ACNE OVERVIEW — Acne is a skin condition in which the pores become blocked, causing pimples to develop. Acne is the most common skin disorder in North America, affecting an estimated 85 percent of adolescents.

Effective acne treatments are available to treat existing pimples and prevent new ones from developing. In addition, cosmetic treatments can help to reduce scarring and changes in skin color caused by acne.

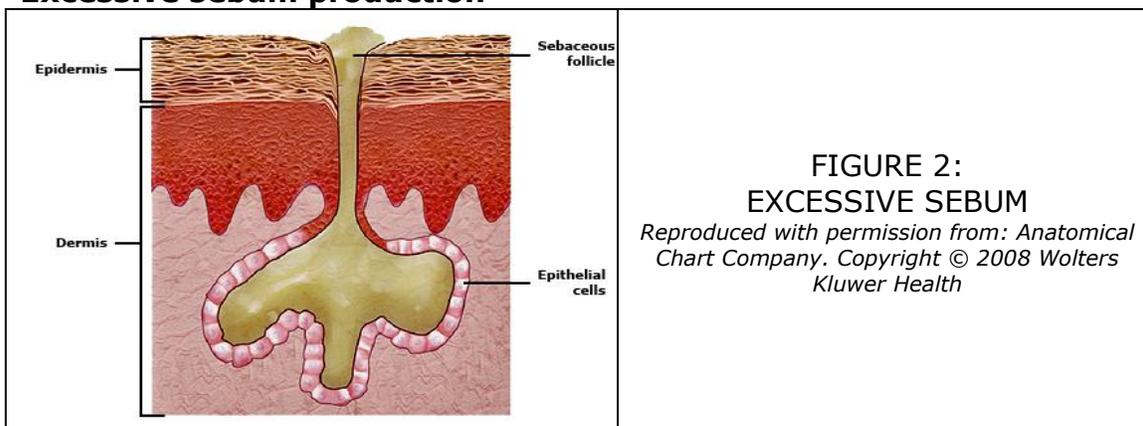
HOW DOES ACNE DEVELOP? — There are four basic steps involved in the development of an acne lesion. Hair follicles become blocked with an **overabundance of normal skin cells** ([figure 1](#)). These cells combine with **sebum** (an oily substance that lubricates the hair and skin), **creating a plug in the follicle**. How acne develops. Increased shedding of epithelial cells..



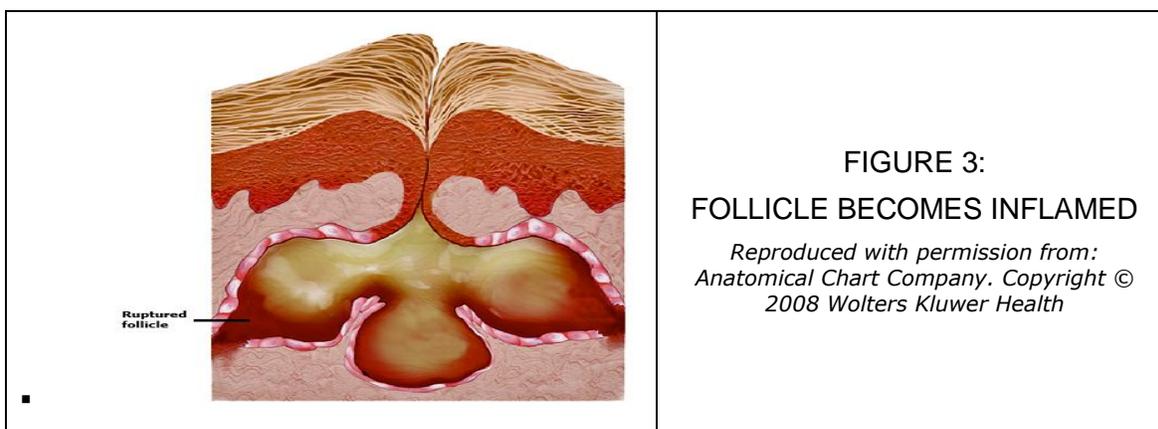
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The glands that produce sebum, known as sebaceous glands, enlarge during adolescence and sebum production increases (figure 2). Numerous sebaceous glands are found on the face, neck, chest, upper back, and upper arms.

- **Excessive sebum production**



- The increase in sebum production allows for the **overgrowth of bacteria** that normally lives on the skin.
- Bacterial overgrowth causes local inflammation, which causes rupture of the follicle (figure 3). This can lead to the formation of a red or tender pimple.



ACNE CAUSES

Hormonal changes — Hormonal changes during adolescence cause the sebaceous glands to become enlarged and sebum production increases. In most people with acne, hormone levels are normal, but the sebaceous glands are highly sensitive to the hormones.

Less often, women's hormone levels are affected by an underlying medical problem known as polycystic ovary syndrome (PCOS).

Acne tends to resolve between ages 30 to 40, although it can persist into or develop for the first time during adulthood. Post-adolescent acne predominantly affects women, in contrast to adolescent acne, which predominantly affects men. Acne can flare before a woman's menstrual period, especially in women older than 30 years.

External factors — Oil-based cosmetics may contribute to the development of acne. Oils and greases in hair products can also worsen skin lesions. Water-based or "non-comedogenic" products are less likely to worsen acne.

People with acne often use soaps and astringents. While these treatments remove sebum from the skin surface, they do not decrease sebum production; frequent or aggressive scrubbing with these agents can actually worsen acne.

Diet — The role of diet in acne is controversial. Some studies have found weak associations between cow's milk and an increased risk of acne, perhaps because of hormones that occur naturally in milk. However, there is no strong evidence that milk, high-fat foods or chocolate increase the risk of acne.

Stress — Psychological stress can probably worsen acne. In several studies of students, acne severity appeared to worsen during times of increased stress [1].

ACNE TREATMENT — There is no single best treatment for acne, and combinations of treatments are sometimes recommended. Since acne lesions take at least eight weeks to mature, you should use a treatment for a minimum of two to three months before deciding if the treatment is effective.

Acne skin care — Skin care is an important aspect of acne treatment.

Skin hygiene — Wash your face no more than twice daily using a gentle non-soap facial skin cleanser (eg, Cetaphil®, Oil of Olay® bar or foaming face wash, or Dove® bar) and warm (not hot) water. Some providers recommend avoiding use of a washcloth or loofah, and instead using the hands to wash the face. Vigorous washing or scrubbing can worsen acne and damage the skin's surface.

Do not pick or squeeze pimples because this may worsen acne and cause skin swelling and scarring. It can also cause lesions to become infected.

Moisturizers — Use of a moisturizer minimizes dryness and skin peeling, which are common side effects of some acne treatments. Moisturizers that are labeled as "non-comedogenic" are less likely to block skin pores.

Sun protection — Some acne treatments increase the skin's sensitivity to sunlight (eg, retinoids, [doxycycline](#)). To minimize skin damage from the sun, avoid excessive sun exposure and use a sunscreen with SPF 15 or higher before sun exposure.

Can I treat my own acne? — If you have mild acne, you can try to treat yourself with non-prescription products initially. Non-prescription acne treatments may include salicylic acid, [benzoyl peroxide](#), sulfur, alpha hydroxy acids, or tea tree oil, all of which are available in non-prescription strengths. A combination of these treatments may be more effective than using one single product alone.

If you do not improve after three months of using non-prescription products or you have moderate or severe acne, consult a healthcare provider for advice on the most effective treatments.

Noninflammatory acne — Noninflammatory acne causes whiteheads or blackheads without redness or skin swelling ([picture 1](#)).



PICTURE 1

The combination of open and closed comedones, as seen here, is most common in younger patients.

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Retinoids — Topical retinoid medications are often recommended for noninflammatory acne. Examples of these medications include tretinoin (Retin-A®, Avita®, Atralin®), [adapalene](#) (Differin®) and [tazarotene](#) (Tazorac®).

Retinoids are usually applied once per day, although people who develop skin irritation can reduce this to every other day or less, then increase as tolerated over time. Most people become more tolerant of retinoids over time.

Most retinoids are available in a gel or cream. People with oily skin may prefer gels because they have a drying effect, while people with dry skin may prefer a cream.

Retinoids can cause skin irritation. While using topical retinoids, you should apply a sunscreen with SPF 15 or greater before sun exposure.

Other acne products — People who cannot tolerate retinoids may try other topical medications, such as salicylic acid, glycolic acid, or [azelaic acid](#) (Azelex®, Finacea®). All of these treatments can be helpful in reducing noninflammatory acne, and azelaic acid may reduce acne-related darkening of skin.

Mild to moderate inflammatory acne — Mild to moderate acne with some inflammation ([picture 2](#)) is usually treated with topical retinoids (see '[Retinoids](#)' above), topical antibiotics, or [benzoyl peroxide](#).



PICTURE 2

Acne can cause the skin to become inflamed, turn red, and swell.

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A combination of two medications, usually [benzoyl peroxide](#) with a topical antibiotic or retinoid (eg, tretinoin), is more effective than treatment with one agent alone.

Benzoyl peroxide — [Benzoyl peroxide](#) is usually applied twice per day. It may be combined with a topical retinoid, in which case the benzoyl peroxide is applied in the morning and the retinoid is applied at night. Benzoyl peroxide can irritate the skin, sometimes causing redness and skin flaking, and it can bleach clothing, towels, bedding, and hair.

Topical antibiotics — Topical antibiotics (creams or liquids) control the growth of acne bacteria and reduce inflammation. Topical antibiotics include [erythromycin](#), [clindamycin](#), [sulfacetamide](#), and [dapson](#).

Moderate to severe inflammatory acne — For people with moderate to severe inflammatory acne ([picture 3](#)), oral antibiotics or an oral retinoid known as [isotretinoin](#) (Amnesteem®, Clavaris®, Sotret®) may be recommended. Topical medication may be used in combination with oral treatments.

Severe cystic acne



PICTURE 3

This patient was subsequently treated with isotretinoin (Accutane).

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Women often benefit from hormonal treatment with a birth control pill (see '[Hormone therapy](#)' below).

Oral antibiotics — Oral antibiotics work to slow the growth of acne-producing bacteria. However, oral antibiotics can have bothersome side effects, including vaginal yeast infections in women and stomach upset.

[Doxycycline](#) and [minocycline](#) are the most commonly prescribed oral antibiotics for acne. They cannot be used during pregnancy or in children less than 9 years of age.

Oral isotretinoin — Oral [isotretinoin](#) (Amnesteem™, Claravis™, Sotret®) is a potent retinoid medication that is extremely effective in the treatment of severe acne. It cures or significantly improves acne in the majority of patients. Oral isotretinoin is effective in treating the most disfiguring types of acne. (See "[Oral isotretinoin therapy for acne vulgaris](#)".) Isotretinoin used to be sold as Accutane®, but that brand name is no longer available

Oral [isotretinoin](#) is usually taken in pill form once or twice daily with food for 20 weeks, then stopped. In some cases, acne can initially worsen before it improves. To reduce the risk for this initial flare of acne, isotretinoin is sometimes given at a lower dose for the first month of treatment. After treatment is stopped, improvement can continue for up to five months.

Side effects and risks — Despite its positive effects, oral [isotretinoin](#) can have serious side effects and should be used with caution. Taking isotretinoin during pregnancy can cause miscarriage and life-threatening malformations in the baby. For these reasons, there are strict rules in the United States for healthcare providers, pharmacists, and patients regarding the use and prescription of oral isotretinoin. Prescriptions of isotretinoin are regulated by the iPLEDGE program (www.ipledgeprogram.com), which requires the following:

- All women must have two negative pregnancy tests before receiving a prescription, and then they must have monthly pregnancy tests throughout the course of treatment.
- Women who could become pregnant must fill their prescription within seven days of receiving it; after this time, a new prescription must be written.
- Any woman who is or might become sexually active with a male partner must use two forms of birth control for at least one month before starting therapy and continue until one month after stopping [isotretinoin](#).
- Women who cannot become pregnant and men must also participate in iPLEDGE, but do not require pregnancy testing or use of birth control.

Information about oral [isotretinoin](#) can be found at the United States Food and Drug Administration web site, (www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/DrugSafetyInformationforHealthcareProfessionals/ucm085227.htm).

A variety of non-pregnancy related side effects may occur during [isotretinoin](#) therapy:

- Dryness or peeling of skin, soreness and cracking of the lips, itching, muscle pain, nosebleeds, difficulty wearing contact lenses, and sensitivity to the sun may occur during treatment.
- There is concern about the relationship between [isotretinoin](#) and depression and suicidal behavior. While there is not enough evidence to conclude that it causes depression or suicidal behavior, patients taking isotretinoin should report any sadness, depression, or anxiety to their healthcare provider.
- [Isotretinoin](#) can cause increases in blood levels of triglycerides (fatty substances related to cholesterol), liver damage, pancreatitis, and changes in the blood counts. It is unclear whether isotretinoin treatment increases the risk for inflammatory bowel diseases such as ulcerative colitis and Crohn's disease.

While many of these side effects can be managed without stopping the drug, others can be dangerous and require that you immediately stop taking it. Stay in touch with your doctor, and follow instructions for getting regular blood tests to monitor cholesterol, triglycerides, liver function, and blood counts.

Hormone therapy — The hormone estrogen can help to offset the effect of androgens (hormones responsible for acne development). Estrogen treatment in the form of a birth control pill is sometimes recommended for women with moderate or severe acne.

Not all oral contraceptives should be used for the treatment of acne; some can actually worsen acne. Certain types of intrauterine devices (IUDs) and some injectable forms of birth control also may worsen acne. Discuss the best options with your healthcare provider.

Other medications are available to reduce the effects of androgens in women, including [spironolactone](#). Rarely, spironolactone can cause high blood levels of potassium. In addition, spironolactone can cause birth defects.

The benefits of birth control pills and other hormonal medications may not be noticeable until three to six months after treatment is started.

Acne and pregnancy — Many acne treatments are not safe for use during pregnancy. Women who are pregnant or intending to become pregnant should consider stopping all acne treatments before becoming pregnant. If acne therapy becomes necessary, discuss the options with your healthcare provider.

WHERE TO GET MORE INFORMATION — Your healthcare provider is the best source of information for questions and concerns related to your medical problem.

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