

ACNE

BACKGROUND

Acne affects between 50-80% of teenagers and young adults. It is a disorder of the pilosebaceous unit (hair follicle and associated oil gland). Factors that contribute to acne formation include increased sebum (a substance made up of oil and wax that functions to protect the skin), increased build-up of material in the hair follicle, increased levels of *Cutibacterium acnes* (a bacteria that is commonly present on the skin in low numbers), and inflammation. Clinically, there are three categories of acne including comedonal (whiteheads and blackheads), inflammatory (red bumps), and nodular (large, painful cysts).

Hormones signal oil glands in the skin to increase their production of sebum. A plug of sebum and keratin (a protein that helps maintain the structure of the skin, hair, and nails) forms and blocks the opening of the hair follicle creating whiteheads and blackheads. The increased sebum supports increased concentrations of *P. acnes*. This leads to further blockage of the hair follicle opening and to increased inflammation. Ultimately the hair follicle can rupture, resulting in large, painful nodules. Insulin also contributes to the formation of acne. Insulin and insulin-like growth factor act by directly increasing the activity of the oil gland, as well as by indirectly increasing the levels of other hormones that stimulate the oil gland including insulin-like growth factor and androgens.

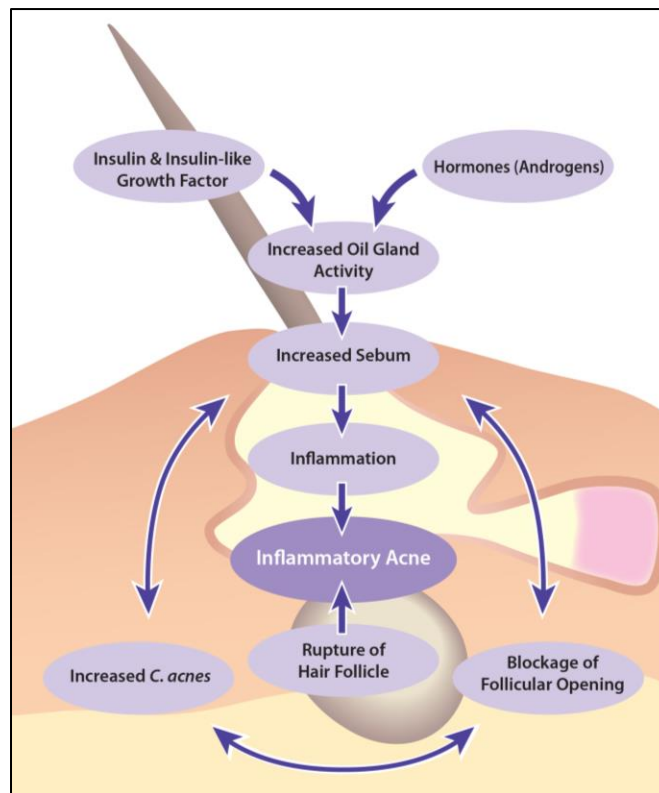


Figure 1. Pathophysiology of Acne

There are many factors to take into account when deciding on a treatment plan: the type of acne, the severity of acne, whether there is scarring, what has been tried in the past, and the psychological impact should all be assessed. In girls and women, information about menstrual history (specifically regularity, duration, and quantity of bleeding) and signs of hormonal abnormalities (excessive facial hair, insulin resistance) can also be helpful.

TREATMENT

SKIN CARE

The first step to managing acne is to adhere to gentle skin care practices. The skin should be rinsed gently with warm water once or twice a day. Washcloths or other abrasive materials should be avoided, and only gentle, nonsoap-based cleansers should be used. Detergent-based soaps, toners, and astringents further dry and irritate the skin. While they do remove oil and sebum from the surface of the skin, they do not alter sebum production within the oil gland. Ultimately, overly dry skin signals the pilosebaceous units to make more oil in order to adequately protect the skin. Moisturizers can help acne, but it is important to make sure any moisturizers or cosmetics are not oil based and are labeled noncomedogenic.

The impulse to pick and squeeze acne lesions is common and can be difficult to overcome. These practices can lead to immediate gratification, but ultimately slow down the disappearance of specific acne lesions. These practices also result in tissue injury, which creates more inflammation and potential scarring that is very difficult, if not impossible, to reverse.

FOOD & DRINK

Healthy dietary choices are important for overall health. Anti-inflammatory or Mediterranean-style dietary approaches have been found to enhance many aspects of health—especially in the setting of inflammatory diseases. Acne is an inflammatory condition and will likely improve when dietary choices better align with foods that inhibit rather than promote inflammation.[1] In particular, low glycemic index/low glycemic load diets have been shown to improve acne in clinical trials.[2] More information about these dietary approaches can be found in the [“Food and Drink,”](#) Whole Health overview.

Avoiding or limiting all forms of dairy may be beneficial. Dairy intake has been linked to increased risk and severity of acne. This is likely in part due to stimulating increased levels of insulin-like growth factor.[3] Limiting the intake of foods high in added hormones (such as meat and dairy) may also be helpful since these foods may alter hormonal balances and may lead to overstimulation of the oil gland.

There is also evidence that increasing plants in the diet can help treat acne. We know that plants are full of prebiotics—compounds that are either indigestible or partially digestible by humans, which can be metabolized by the microbiome in our guts. Basically, plants help feed the gut microbiome and help keep it healthy. Maintaining a healthy balance of

microbes in the gut is important for many areas of health including acne. Other mechanisms that have been proposed for benefits of diets rich in plants for patients with acne include modulation of hormones, normalization of blood sugar and insulin sensitivity and anti-inflammatory benefits.[4]

SUPPLEMENTS

Note: Please refer to the [Passport to Whole Health](#), Chapter 15 on Dietary Supplements for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

OMEGA-3 FATTY ACIDS

Omega-3 fatty acids have been shown to decrease the production of inflammatory compounds and of the hormones important in acne formation.[5] Additionally, groups of people who consume high amounts of omega-3 fatty acids have less acne than groups of people who have lower levels of this nutrient. Ideally, omega-3 fatty acids should come from foods such as fatty fish (salmon, mackerel, and sardines), flaxseeds, and walnuts. When that is not possible, supplements can be helpful. The omega-3s in flax are not as potent as those from fish oil; refer to the Whole Health overview "[Food and Drink](#)" for details.

Dose:[6]

- 1tbsp of flax oil for every 100 lb daily
- 1-2 tbsp of ground flaxseeds daily
- 1-2 gm of fish oil capsules twice daily

BREWER'S YEAST

Brewer's yeast (*Saccharomyces cerevisiae*) is commonly used to treat acne in Eastern Europe. It has a high concentration of chromium picolinate, which has been shown to improve glucose tolerance and insulin sensitivity (thereby reducing insulin and insulin-like proteins in the blood stream). One study looked at brewer's yeast supplementation in people with acne and found significant improvement in 80% of those taking the supplement.[7] It is generally quite safe, but due to high levels of tyramine, it can cause headaches in people sensitive to this compound and can cause higher blood pressures in people who are also taking monoamine oxidase inhibitors. Brewer's yeast may also worsen Crohn's disease.[8] Oral antifungal medications may decrease the effectiveness of the yeast.

- **Dose:[7]** 2 gm of dried brewer's yeast three times a day

PROBIOTIC

Both Lactobacillus and Bifidobacterium are lactic acid producing bacteria found in high numbers in the human gut. There have been a few small studies that have found probiotics (particularly strains of Lactobacillus and Bifidobacterium) to be helpful in the treatment of acne.[9-11]

- **Dose:** No clear dosing has been established for acne. Consider a product that contains both Lactobacillus and Bifidobacterium strains and at least 10 billion colony forming units (CFUs).

VITAMINS AND MINERALS

Studies have found that vitamin A, vitamin E, and/or zinc are decreased in patients with acne.

Zinc. Zinc is a cofactor in many reactions important in maintaining skin health and immune function. It has anti-inflammatory properties as well as inhibitory effects on *C. acnes*. Many studies show that supplementation can improve acne. It is likely that the formulation of zinc is important, and it appears that effervescent preparations of zinc, zinc picolonate, and methionine-bound zinc are more bioactive than other formulations such as zinc gluconate.

- **Dose:**[12] 30 mg elemental zinc a day*

*At doses higher than 30 mg a day, zinc can induce a copper deficiency; 2 mg of copper should be added for every additional 30 mg of elemental zinc.

Food sources: oysters, beef, poultry (dark meat), pork, beans, nuts

Vitamin A. Vitamin A modulates the immune system and decreases keratinization of the hair follicle. However, studies looking at the effectiveness of preformed vitamin A supplementation in acne have found that only very high doses effectively improve acne. These doses were well above the upper limit of safety set by the Recommended Daily Allowance (RDA), and most participants had significant side effects consistent with hypervitaminosis A. Hypervitaminosis A is a set of symptoms caused by the intake of toxic amounts of preformed vitamin A. Symptoms can include headaches, sore muscles, nausea, dry skin and mucous membranes, fatigue, nausea, hair loss, liver damage, and severe damage to a fetus when levels are high in pregnant women.

Because of the significant risks, it is reasonable to recommend conservative supplementation to the levels set by the RDA, but higher doses should be avoided.

- **Dose:** RDA for women is 2,300 IU a day and for men is 3,000 IU a day

Food sources: liver, cod liver oil, fish oils, milk, eggs

Vitamin E. This vitamin is a strong antioxidant. Although it has been found in lower concentrations in patients with acne, the specific role vitamin E plays in the development of acne is not clear. It is generally considered safe up to doses of 1,500 IU a day. At higher doses, there is a risk of problems with blood clotting, which can lead to increased bleeding.

- **Dose:** RDA for people older than 14 years is 22.5 IU

Food sources: eggs, fortified cereals, fruit, leafy greens (spinach), meat, nuts and nut oils, other oils, poultry, wheat germ, whole grains

NicAzol. NicAzol is a prescription dietary supplement that contains zinc and copper along with some B vitamins and azelaic acid (a compound found in grains that is used topically as a prescription formulation to treat acne). It is fairly new but does offer an alternative to prescription antibiotics for the treatment of acne.[13]

TOPICAL BOTANICALS

TEA TREE OIL

Tea tree oil is an essential oil extracted from the Australian tea tree (*Melaleuca alternifolia*). It has been shown to have antimicrobial effects against *C. acnes* and does appear effective for mild to moderate acne. It can produce contact dermatitis in some people.

- **Dose:**[14] 5%-15% solution or gel applied once daily as spot or area treatment

GREEN TEA

Some of the compounds in green tea have antimicrobial and anti-inflammatory properties. Additionally, it appears to decrease sebum production. Studies looking at its use in mild to moderate acne are promising.

- **Dose:**[15] 2%-3% cream, lotion, or gel applied twice a day

TOPICAL OVER-THE-COUNTER MEDICATIONS

SULFUR

Sulfur helps by unclogging blocked pores (comedones) and blocking the growth of *C. acnes*. It can cause irritation, and many formulations have an unpleasant odor.

- **Dose:**[16] 1%-10% available as a bar soap, liquid wash, cream, or ointment

BENZOYL PEROXIDE

Benzoyl peroxide has antibacterial properties against *C. acnes* and is useful in treating acne. It can cause irritation—especially at higher concentrations—and will bleach fabric.

- **Dose:**[16] 2.5%-10% (cream, lotion, gel, or wash) applied once or twice a day

SALICYLIC ACID

Salicylic acid can be useful in treating acne by unclogging blocked pores (comedones). It can cause irritation.

- **Dose:**[16] Creams, lotions, and washes in concentrations up to 2%. Higher concentrations are available in prescription formulations or as chemical peels.

MIND-BODY

Acne is a condition that can carry a significant emotional and social burden. Many people with acne have associated lower self-esteem, depression, and anxiety. Additionally, stress can exacerbate flares. Mind-body approaches such as biofeedback, clinical hypnosis, Guided Imagery, mindful awareness, and cognitive behavioral therapy can help minimize depression and anxiety, and boost self-esteem.[17] Finally, picking at acne lesions can lead to permanent scarring, and this behavior can be addressed through mind-body approaches as well.

ACUPUNCTURE

There have been a few studies looking at acupuncture for treating acne. A review and meta-analysis found that while the results have not been overwhelmingly positive, it does appear that acupuncture may be as effective as pharmacological treatment for acne vulgaris. While evidence does not support using acupuncture widely in acne patients, it may be a good option for some patients who do not tolerate or respond to more traditional approaches.[18]

PHARMACOLOGIC APPROACHES

There are many topical and oral medications that can be used successfully to treat acne. This document is intended to focus on other therapeutic options within the realm of integrative approaches to this common skin condition.

PREVENTION

- Take gentle care of your skin.
- Eat a plant-rich, low glycemic index/low glycemic load diet that contains foods rich in omega-3 fatty acids (salmon, nuts, flax).
- Consider taking a probiotic that contains at least 10 billion CFU and is composed of a mix of Lactobacilli and Bifidobacterium species.
- Avoid dairy and meat from animals treated with exogenous hormones.
- Consider taking an omega-3 supplement.
- Consider taking a good-quality multivitamin that contains appropriate doses of zinc, vitamin A, and vitamin E.
- Learn about different approaches to stress management.
- Avoid picking or squeezing acne lesions.

RESOURCE LINKS

- [Food and Drink](https://www.va.gov/WHOLEHEALTHLIBRARY/self-care/food-and-drink.asp): <https://www.va.gov/WHOLEHEALTHLIBRARY/self-care/food-and-drink.asp>
- [Passport to Whole Health](https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf): https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf

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REFERENCES

- 1 Smith RN, Mann NJ, Braue A, Makelainen H, Varigos GA. A low-glycemic-load diet improves symptoms in acne vulgaris patients: a randomized controlled trial. *Am J Clin Nutr.* 2007;86(1):107-115.
- 2 Ismail NH, Manaf ZA, Azizan NZ. High glycemic load diet, milk and ice cream consumption are related to acne vulgaris in Malaysian young adults: a case control study. *BMC Dermatol.* 2012;12:13.
- 3 Melnik BC, Schmitz G. Role of insulin, insulin-like growth factor-1, hyperglycaemic food and milk consumption in the pathogenesis of acne vulgaris. *Exp Dermatol.* 2009;18(10):833-841.
- 4 Clark AK, Haas KN, Sivamani RK. Edible plants and their influence on the gut microbiome and acne. *Int J Mol Sci.* 2017;18(5).
- 5 McCusker MM, Grant-Kels JM. Healing fats of the skin: the structural and immunologic roles of the omega-6 and omega-3 fatty acids. *Clin Dermatol.* 2010;28(4):440-451.
- 6 *Integrative Medicine.* 2nd ed. Philadelphia, PA: Elsevier Saunders; 2007.
- 7 Weber G, Adamczyk A, Freytag S. [Treatment of acne with a yeast preparation]. *Fortschr Med.* 1989;107(26):563-566.
- 8 Barclay GR, McKenzie H, Pennington J, Parratt D, Pennington CR. The effect of dietary yeast on the activity of stable chronic Crohn's disease. *Scand J Gastroenterol.* 1992;27(3):196-200.
- 9 Siver RH. Lactobacillus for the control of acne. *J Med Soc New J.* 1961;59:52-53.
- 10 Volkova LA, Khalif IL, Kabanova IN. [Impact of the impaired intestinal microflora on the course of acne vulgaris]. *Klin Med (Mosk).* 2001;79(6):39-41.
- 11 Marchetti F, Capizzi R, Tulli A. [Efficacy of regulators of the intestinal bacterial flora in the therapy of acne vulgaris]. *Clin Ter.* 1987;122(5):339-343.

- 12 Dreno B, Amblard P, Agache P, Sirot S, Litoux P. Low doses of zinc gluconate for inflammatory acne. *Acta Derm Venereol*. 1989;69(6):541-543.
- 13 Shalita AR, Falcon R, Olansky A, et al. Inflammatory acne management with a novel prescription dietary supplement. *J Drugs Dermatol*. 2012;11(12):1428-1433.
- 14 Enshaieh S, Jooya A, Siadat AH, Iraj F. The efficacy of 5% topical tea tree oil gel in mild to moderate acne vulgaris: a randomized, double-blind placebo-controlled study. *Indian J Dermatol Venereol Leprol*. 2007;73(1):22-25.
- 15 Elsaie ML, Abdelhamid MF, Elsaie LT, Emam HM. The efficacy of topical 2% green tea lotion in mild-to-moderate acne vulgaris. *J Drugs Dermatol*. 2009;8(4):358-364.
- 16 Akhavan A, Bershad S. Topical acne drugs: review of clinical properties, systemic exposure, and safety. *Am J Clin Dermatol*. 2003;4(7):473-492.
- 17 Shenefelt PD. Biofeedback, cognitive-behavioral methods, and hypnosis in dermatology: is it all in your mind? *Dermatol Ther*. 2003;16(2):114-122.
- 18 Mansu SSY, Liang H, Parker S, et al. Acupuncture for Acne Vulgaris: A Systematic Review and Meta-Analysis. *Evid Based Complement Alternat Med*. 2018;2018:4806734.