

The Cause of Acne

Sebaceous (oil) glands generate oil. The nose area is typically affected by acne because the sebaceous glands are larger and more active in this vicinity than in any other area of the face. In order to accommodate the large flow of oil produced, the pores in this area are larger. Acne tends to be found in areas where sebaceous glands are heavily concentrated: such as the neck, chest, and back-areas.

Genetics determines how much oil an individual produces. Hormones act upon the oil gland, and therefore, it is referred to as an end organ. Hormones and the oil gland, or “end organ response”, influence this condition. While many individuals may have the same level of hormones, different amounts of oil will be produced because each individual’s oil glands respond differently. During adolescence, there is a distinct rise in the level of sex hormones, or androgens, which enlarge and encourage the sebaceous glands to produce more sebum (oil). This may cause or exacerbate the problem of oily skin.

Acne patients also tend to have an abnormal desquamation (exfoliation) of follicle epithelium*, which creates altered keratinization. This condition is known as comedogenesis, a process which results in the development of a still unseen microcomedone. Eventually, this lesion will develop into a non-inflammatory lesion (blackhead or whitehead), or an inflammatory one. If the comedo bursts, the area becomes inflamed and turns into papules, pustules, or cysts. If there is a large amount of the bacterium *Propionibacterium acnes*, continued infection and inflammation may occur.

*Membranous tissue composed of one or more layers of cells separated by a small amount of intercellular substance and forming the covering of the majority of internal and external surfaces of the body and its organs.

Caring for Acne

In order to effectively treat and care for acne, it is necessary to accurately diagnose the type of acne each individual is experiencing. There are several skin conditions, which resemble acne, such as Rosacea and gram-negative Folliculitis, but these conditions are completely unrelated. It is important to see a dermatologist in order to ensure that a correct diagnosis is made and appropriate treatment may be prescribed.

Acne may be diagnosed by the age at which it strikes, or by the types of lesions which predominate the affected area: comedonal, papulopustular, or cystic. Comedonal lesions include blackheads (open comedo) or whiteheads (closed comedo). When infected or inflamed, these lesions become red and raised. Papules or pustules are milder and more common. Cysts are the large, painful lesions which seem to be buried within the skin and are responsible for most acne scars. Once acne is diagnosed, it is then categorized as mild, moderate, or severe.

There are four main factors to be considered when treating acne: Comedogenesis, Sebum production, *P. acnes* (the bacteria), and Inflammation.

Acne Treatments and their Targets			
Comedogenesis	Sebum Production	<i>P. acnes</i>	Inflammation
<ul style="list-style-type: none"> • Retinoids • Benzoyl Peroxide • Isotretinoin • Sulfur • Salicylic Acid • Azelaic Acid • Alpha hydroxy acid 	<ul style="list-style-type: none"> • Retinoids • Antiandrogens • Low-dose oral contraceptives 	<ul style="list-style-type: none"> • Antibiotics • Retinoids • Benzoyl peroxide • Mandelic Acid 	<ul style="list-style-type: none"> • Oral Antibiotics • Retinoids

There are two main categories used to describe the non-surgical treatment of acne: topical or systemic. Topical treatments include Benzoyl Peroxide, Alpha Hydroxy Acids (AHA), Topical Antibiotics, Retin-A, and various cleansers, soaps, and astringents. Systemic treatments consist of oral antibiotics, isotretinoin (Accutane), or hormonal therapies. Often a combination of treatments is usually prescribed to effectively combat all four of the factors contributing to acne.

Keratolytic (Exfoliating) Agents:

These agents affect the **comedogenesis** (see table above) process by normalizing desquamation (the exfoliation process). This, in turn, assists with proper exfoliation and softens the follicle epithelium, the tiny tissue, which covers pore openings. AHAs and benzoyl peroxide are the two most frequently used products in this category.

Alpha Hydroxy Acids (AHA):

Glycolic acid is the most recognized of the AHAs, and it is an effective adjuvant therapy for mild acne. Mandelic Acid is not as familiar to most, but it may be considered a more effective AHA in treating and healing acne lesions. Mandelic Acid combines the keratolytic properties of glycolic acid with natural antibacterial properties which aids in minimizing the presence of *P. acnes*. Also, for acne patients with sensitive skin, Mandelic Acid is a much gentler alternative to glycolic acid and other popular agents including Retin-A, benzoyl peroxide, sulfur, or salicylic acid. Mandelic Acid is an effective way to treat mild acne, and can be used in conjunction with other remedies on moderate acne.

Salicylic Acid:

Salicylic Acid is a Beta Hydroxy Acid, which is particularly useful in the reduction of non-inflammatory lesions, such as blackheads and whiteheads. It has a similar exfoliating action to glycolic acid, but it cleans out pores by remaining on the top of the skin.

Benzoyl Peroxide:

Benzoyl Peroxide is available in a number of formulations and strengths. It remains one of the most potent anti-microbial agents available to treat mild acne. For the average patient, there is not a significant difference between the effectiveness of the various formulations and concentrations.

“Benzoyl Peroxide rapidly improves both inflammatory and noninflammatory lesions by reducing the population of *P. acnes*, and facilitating a decrease in the free fatty acids that ultimately lead to retention hyperkeratosis, and microcomedo formation.” – *Cosmetic Dermatology – April 1999*

Sulfur and Resorcinol:

Older medications which work on the surface of the skin to heal existing blemishes by unclogging pores.

Tretinoin (Retin-A):

Tretinoin normalizes the exfoliation of the follicular epithelium and eliminates the microorganisms that encourage inflammation. It also drains clogged pores, supports the healing of blemishes, and prevents new blemishes from forming.

“...tretinoin may enhance penetration of other drugs, such as topical antibiotics and antimicrobials (Benzoyl peroxide), by facilitating the unplugged follicle to become less anaerobic and more accessible. This inhibits the growth of *P. acnes* and minimizes the rupturing of comedones into surrounding tissue. As a result, tretinoin is a first line agent for both inflammatory and non-inflammatory acne.”

– *Cosmetic Dermatology April 1999.*

Peeling, redness, irritation, dryness, and increased sun sensitivity are all possible side effects of tretinoin. When applied at acne sites in small doses, plasma Vitamin A levels are not affected, which suggests that topical tretinoin is a safe choice for pregnant women

Tretinoin Formulas:

Tretinoin is available in an assortment of formulations such as cream, gel, and liquid. Choosing a formulation depends upon an individual's skin type, skin condition, and environment. There have been several new developments in the Tretinoin field which include the introduction of generic formulations and a new microsphere formulation. The microsphere formulation was developed to diminish irritation, characteristic of the traditional Tretinoin. Instead of releasing the tretinoin into the skin upon application, the formulation contains the Tretinoin in a microsponge which attaches to the hair follicle before releasing the drug. The microsphere formulation has been proven to reduce twice the number of inflammatory and noninflammatory lesions as the regular formulation. Improvement, including decreased irritation, is evident in as quickly as two weeks. The first generic version of Retin-A, Avita, was approved by the FDA in 1997. Both formulations are composed of the same active ingredient, but the delivery system varies. A study illustrated that the efficacy of the two were comparable, though there are some lingering reservations with generic substitutes. The primary concern arises from a patient starting with the original product, who then switches to the generic version. Differences in innovator and generic products may trigger an allergic reaction (this is a concern with all products, not just Tretinoin). Switching products during the course of treatment may ultimately result in minimal progress or treatment failure.

Isotretinoin:

More commonly referred to as Accutane, this drug affects all four of the contributing factors to the manifestation of acne. Accutane prevents comedogenesis by increasing exfoliation. It reduces sebum production, which may result in dryness in the skin, mucous membranes, and eyes. It also discourages inflammation, a result of the reduced growth of *P. acnes*. Generally reserved for individuals with severe and/or cystic acne, Accutane is also prescribed for patients who have not responded to other treatments. The average treatment period is four months, and

doses vary according to the severity of the acne. This drug provides long-lasting remissions and skin is usually acne-free after treatment is completed. Teenagers with cystic acne are at an increased risk of relapse after the program is finished and another session may be necessary. It may take between two to four treatment sessions before permanent remission is reached. Treatment failure may be the result of insufficient dosing or interference of other drugs such as lithium and phenytoin. Sinus tract disease may also present some minor complications; individuals with a history of the disease should consult with their physician first. Possible side effects include dryness of the skin, eyes and/or mucous membranes, headaches, nasal irritation, increased sun sensitivity, hair loss, diminished night vision, and birth defects (if pregnancy occurs during treatment). Isotretinoin **MUST NOT** be taken while pregnant, and two forms of reliable birth control are crucial while taking the medication. After completing Accutane therapy, it is advisable to wait at least three months before becoming pregnant.

Topical Antibiotics:

The two most frequently used antibiotic treatments are Clindamycin and Erythromycin. The efficacy of these treatments, which are clinically equal, arises from their ability to reduce the P. acnes bacteria on the skin's surface and in the follicle. Though topical antibiotics are naturally anti-inflammatory, they have no comedolytic effects, and do not help preexisting blemishes. Topical clindamycin is available in solution, gel, and lotion formulations; topical erythromycin is available in cream, solution, gel, pledget and wipes. Lesions are typically reduced by 50%-60% with the use of topical antibiotics; the inclusion of zinc with erythromycin enhances the effectiveness of the therapy, and reduces blemishes even further. Once progress with topical antibiotics starts to wane, temporarily discontinue the treatment to prevent a tolerance to the drug from occurring.

Oral Antibiotics:

Oral antibiotics such as tetracycline, minocyclene, and erythromycin are usually reserved for the treatment of moderate to severe acne. They are typically prescribed for an extended period of four to six months. Oral antibiotics possess anti-inflammatory properties, and suppress P. acnes. As with topical antibiotics, if oral antibiotics are paired with Retin-A, results will be enhanced, response time improved, and side effects will be minimized.

Azelaic Acid Cream (A New Treatment):

Recently approved by the Food and Drug Administration, Azelaic Acid Cream contains anti-keratinizing, anti-bacterial, and anti-inflammatory properties.

“Azelaic Acid Cream (20%) has been shown to significantly reduce inflammatory and non-inflammatory acne lesions with an efficacy comparable to that of tretinoin (0.05%), benzoyl peroxide (5%), and topical erythromycin (2%), for the management of mild to moderate acne.” – *Cosmetic Dermatology April 1999*

Moisturizers for Acne:

Typically, the medications used to combat acne are drying to the skin. Moisturizers are an integral step in healing acne prone skin as they help rebalance the skin and reduce excess oil production. Liquid or serum moisturizers are the best choices because most solid moisturizers, such as lotions and creams, are made of pore-clogging waxes and emulsifiers. Squalane, a predominant ingredient in the skin's sebum, is a good choice for acne-prone skin. Gentle and allergy free, it accommodates sensitive skin also. Whether plant or animal-derived, Squalane is fast-absorbing and non-greasy,. ProCyte Squalane (listed above) whose 100% squalane formula is plant-derived is often recommended. Also watch for hyaluronic acid, a natural

moisturizing ingredient found in abundance in tissues throughout the body. It also provides cushioning for the cells and helps to transport nutrients.

Adult Onset Acne

Acne can strike at any age. Once thought to be an adolescent condition, there is a new realization that acne can affect all ages, especially adults. Unfortunately, adults also need to consider the sun damage they have incurred during their early years. Adults suffering from acne need a treatment, which will address breakouts and the maturation of the skin.

Alpha Hydroxy Acids (mandelic acid), Vitamin A (retinol, tretinoin), and Vitamin C (anti-inflammatory properties, which help to minimize redness and swelling) all help with breakouts and also provide anti-aging benefits. An anti-bacterial skin cleanser, such as the NuCèlle® Mandelic Marine Complex® Wash is advised in addition to one or more of these remedies.

As skin ages, it tends to become drier, regardless of breakouts. If skin feels uncomfortably dry, apply a replenishing moisturizer such as NuCèlle®'s Mandelic Marine Complex® Anti-Oxidant Moisturizer or the ProCyte Squalane. These products will replenish the skin's protective barrier and help it to trap water, without clogging pores.

Other Useful Tips

Though there is no guarantee against breakouts, it is hoped that by following these suggestions, excess oil production and acne breakouts will be manageable:

- ❖ Proper cleansing is an important step in developing an effective skin maintenance regime, and preventing the situation from deteriorating. Though surface dirt and oil do not cause acne, excessive oil may worsen the condition by clogging the pores. Avoid washing with hot water and harsh soaps or cleansers: these may further aggravate and overly dry the skin to the point where acne therapies in a cream or gel form may no longer be a viable solution. The majority of topical acne medications have a drying effect on oily skin.
- ❖ Wash with a gentle cleanser that cleans the skin without over drying
- ❖ Use water-based, non-comedogenic cosmetics and avoid using any oil-based formulations, which will irritate oily skin and create further blemishes
- ❖ Make it a habit to always remove makeup before going to bed, but stay away from formulations, which may leave a greasy residue on your skin, such as cold creams and lotions
- ❖ Pay attention to your diet. On an interesting note, it is not chocolate or sweets that appear to be the problem. Some physicians believe that an increase in iodine consumption aggravates acne and recommend a reduction or elimination of fish and iodized salt.
- ❖ **Try to Relax!!!** Physicians have long witnessed a link between stress and acne. Studies show that a person under stress produces more androgens, an increase, which may encourage acne breakouts by stimulating the sebaceous glands, which then pump

out more sebum. Even physical strains, such as colds, allergies, surgery, or menstruation, can cause break-outs.

Skin Care

In order to prevent skin from becoming overly irritated or dried out during acne treatments, it is necessary to follow a regular skin maintenance regime. A clear indication that skin has become too dry may be when you feel that it is necessary to apply a moisturizer. A moisturizer may not be necessary for oily skin. It may be time to adjust the regime if skin begins feeling uncomfortably tight or dry, unless an individual is using a physician prescribed medication. For patients using Retin-A or Accutane, who are looking for a light moisturizer, the LRS Lipid Recovery Serum is an excellent choice. Specially formulated to replenish lipids in the skin, the LRS is a lightweight, anti-inflammatory hydrator that eases inflammation, and supports tissue healing and rebuilding. The NuCelle[®] Mandelic Marine Complex[®] (Mandelic Acid is a natural anti-bacterial Alpha Hydroxy Acid) is a gentle skin conditioning system for acne, which effectively peels and loosens pore-clogging dead skin, removing it before a problem can begin. NuCelle[®] formulations destroy the bacteria, which clogs pores and causes blemishes. The system includes a wash, toner, serum and moisturizer. The system also offers a special oil-controlling moisturizer for oily skin types. NuCelle[®]'s formulations are also safe for darker skin types.