

1. ACNE

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Approach

The general approach to summarizing the key literature on acne in adolescents and adult women was to review two adolescent health text books (Vernon and Lane, 1992; Paller et al., 1992) and two articles chosen from a MEDLINE search of all English language articles published between the years of 1990 and 1995 on the treatment of acne.

IMPORTANCE

Acne is the most common skin disorder seen during adolescence. Forty percent of children between the ages of 8 and 10 develop early acne lesions, and eventually 85 percent of adolescents develop some degree of acne (Vernon and Lane, 1992; Paller et al., 1992). Acne can persist into mid-adulthood in some persons, and can also present initially in adulthood. It is estimated that 40 to 50 percent of adult women are affected by a low-grade persistent form of acne (Nguyen et al., 1994). Overall, acne affects approximately 10 percent of the U.S. population (Glassman et al., 1993). Acne was the most common reason for visits to dermatologists over the two-year period from 1989 to 1990, accounting for 16.6 percent of all visits (Nelson, 1994). Although acne is not associated with severe morbidity, mortality, or disability it can produce psychological effects. For instance, it has been reported that some adolescents with acne avoid social situations or athletic activities (Brook et al., 1980). Furthermore, in severe cases, acne can lead to physical scarring which may exacerbate the emotional effects of the disease.

EFFICACY AND/OR EFFECTIVENESS OF INTERVENTIONS

Screening

There is no role for screening for acne.

Diagnosis

Common acne is a disorder of the pilosebaceous glands and is characterized by follicular occlusion and inflammation (Paller et al., 1992). Acne occurs primarily on the face, but it can occur on the back, chest, and shoulders. Four factors contribute to the development of acne: 1) the sebum excretion rate, 2) sebaceous lipid composition, 3) bacteriology of the pilosebaceous duct, and 4) obstruction of the pilosebaceous duct. The anaerobic bacterium *Propionibacterium acnes* appears to play an important role in the pathogenesis of acne (Paller et al., 1992). *P. acnes* is capable of releasing lipolytic enzymes that convert the triglycerides in sebum into irritating fatty acids and glycerol, which may contribute to inflammation (Paller et al., 1992).

There are six types of acne lesions: comedones, papules, pustules, nodules, cysts, and scars. Individual patients may have one or more predominant type of lesion or a mixture of many lesions (Paller et al., 1992).

Vernon and Lane (1992) and Glassman et al. (1993) recommend the following in diagnosing acne:

Documentation of the acne history including:

- age at onset of acne;
- location (face, back, neck, chest);
- aggravating factors (stress, seasons, cosmetics, cremes);
- menstrual history and premenstrual worsening of acne;
- previous treatments;
- family history of acne; and
- medications and drug use.

The physical examination should include:

- location of acne;
- types of lesions present;
- severity of disease (numbers of each type of lesion and intensity of inflammation); and
- complications (extent and severity of hyperpigmentation and scarring).

Treatment

Medical treatment of acne is determined by the extent and severity of disease, prior treatments, and therapeutic goals. Each regimen must be followed for a minimum of 4 to 6 weeks before determining whether it is effective (Vernon and Lane, 1992). Table 1.1 lists guidelines to be used in the treatment of acne.

Table 1.1
Guidelines for the Treatment of Acne

Clinical Appearance	Treatment
Comedonal Acne - no inflammatory lesions	Topical tretinoin or benzoyl peroxide
Mild to Moderate Inflammatory Acne - red papules, few pustules	Topical tretinoin <i>and</i> benzoyl peroxide <i>and/or</i> topical antibiotic If acne is resistant to above therapy, add oral antibiotic.
Moderate to Severe Inflammatory Acne - red papules, many pustules	Topical tretinoin; topical antibiotic <i>or</i> benzoyl peroxide; <i>and</i> oral antibiotics
Severe Nodulocystic Acne - red papules, pustules, cysts and nodules	Topical tretinoin; benzoyl peroxide <i>or</i> topical antibiotic; oral antibiotics; <i>and</i> consider isotretinoin

Adapted from: Weston and Lane, 1991; Vernon and Lane 1992; Nguyen, 1994; Taylor, 1991.

Tretinoin and Benzoyl Peroxide

Topical keratolytic therapy is recommended as the primary treatment for comedonal acne to prevent new acne lesions as well as to treat preexisting ones (Paller et al., 1992). Two classes of keratolytics, tretinoin (retin A) and benzoyl peroxide, can be used alone or in combination with each other and will control 80 to 85 percent of acne (Taylor, 1991; Weston and Lane, 1991; Nguyen, 1994). Cream preparations of both tretinoin and benzoyl peroxide should be used because they are less irritating to the skin than gel forms. Tretinoin has a propensity to severely irritate the skin if used incorrectly. To avoid irritation, a low strength (0.025 percent) cream should be applied every other night for one week and then nightly. In addition, because skin treated with tretinoin is more sensitive to sun exposure, sunscreen should be used.

Tretinoin should be avoided during pregnancy because of the potential of photoisomerization to isotretinoin (a teratogen) (Weston and Lane, 1991; Vernon and Lane, 1992).

Improvement of acne after treatment of tretinoin can take six to twelve weeks and flare-ups of acne can occur during the first few weeks due to surfacing of the lesions onto the skin (Nguyen, 1994). Benzoyl peroxide is available over-the-counter in various strengths and applications (gels, creams, lotions, or soaps). All concentrations seem to be therapeutically equivalent (Nguyen, 1994). Mild redness and scaling of the skin may occur during the first week of use.

Topical Antibiotics

Topical antibiotics decrease the quantity of *P. acnes* in the hair follicles. However, they are less effective than oral antibiotics because of their low solubility and consequent difficulty in penetrating sebum-filled follicles (Nguyen, 1994). Topical erythromycin and clindamycin are similar in efficacy and can be used once or twice a day (Weston, and Lane, 1991; Nguyen, 1994). Some percutaneous absorption may rarely occur with clindamycin, resulting in diarrhea and colitis (Weston and Lane, 1991; Nguyen, 1994). Topical antibiotics are frequently used in combination with keratolytics and are most useful for maintenance therapy if improvement after 1 to 2 months of oral antibiotics is observed (Weston and Lane, 1991).

Oral Antibiotics

Patients with moderate to severe inflammatory acne will require oral antibiotics in addition to topical therapy. Tetracycline and erythromycin are the most commonly used systemic antibiotics. Because tetracycline can cause enamel hyperplasia and tooth discoloration it should not be used in pregnant women or in children under 12 years of age (Nguyen, 1994). Minocycline is very effective for many adolescents who have used tetracycline without success (Weston and Lane, 1991). The cost of minocycline, however, limits its use to those patients with severe or recalcitrant acne. When tetracycline is prescribed for female patients, pregnancy status must be monitored since tetracycline is teratogenic (Glassman et al., 1993). There is the potential for broad-

spectrum antibiotics to alter the absorption of oral contraceptives (OCs); therefore, it may be prudent for women on OCs to use an alternate method of birth control when possible.

Isotretinoin

The oral retinoid isotretinoin has been very efficacious in nodulocystic acne resistant to standard therapeutic regimens. In appropriate regimens, isotretinoin has resulted in long-term remission of acne in approximately 60 percent of patients treated (Weston and Lane, 1991). However, it is not recommended as the drug of first choice because of its severe teratogenicity. Current recommendations for women of child-bearing age are: to obtain informed consent; to perform pregnancy tests throughout treatment; to postpone initiating therapy until the menstrual cycle begins; and, to use two effective birth control methods from the month before treatment to one month after discontinuing treatment (Weston and Lane, 1991). Side effects of isotretinoin include dryness and scaliness of the skin, dry lips and occasionally dry eyes and nose. It can also cause decreased night vision, hypertriglyceridemia, abnormal liver function, electrolyte imbalance, and elevated platelet count. Glassman et al. (1993) recommend monthly liver function tests to monitor potential for liver toxicity. Up to 10 percent of patients experience mild hair loss, but the effect is reversible (Weston and Lane, 1991).

Follow-up

Follow-up visits for acne should be scheduled initially every 4 to 6 weeks. Ideal control is defined as no more than a few new lesions every two weeks (Weston and Lane, 1991).

RECOMMENDED QUALITY INDICATORS FOR ACNE

The following criteria apply to adolescents ages 13-18.

Diagnosis

Indicator	Quality of evidence	Literature	Benefits	Comments
<p>1. For all patients presenting with acne, the following history should be documented in their chart:</p> <ul style="list-style-type: none"> • location of lesions (back, face, neck, chest) • aggravating factors (stress, seasons, cosmetics, creams) • menstrual history and premenstrual worsening of acne • previous treatments • medications and drug use 	III	Paller et al., 1992; Vernon and Lane, 1992	Improve acne; decrease psychological effects of acne; and, decrease potential physical scarring.	An adequate history is necessary to determine any potential causes or exacerbating factors of the acne and to document severity and response to treatments.

Treatment

Indicator	Quality of evidence	Literature	Benefits	Comments
2. If oral antibiotics are prescribed, there must be documentation of moderate to severe acne (papules and pustules).	III	Vernon and Lane, 1992; Glassman et al., 1993; Weston and Lane, 1991	Improve acne; decrease psychological effects of acne; and, decrease potential physical scarring.	If only comedones are present, antibiotics should not be prescribed since they are not effective for comedones and have potential toxicities.
3. Tetracycline should not be prescribed for adolescents less than 12 years of age.	III	Nguyen, 1994	Prevent tooth discoloration.	
4. If tetracycline is prescribed, there must be documentation of the last menstrual period or a negative pregnancy test for all girls who have reached puberty.	III	Vernon and Lane, 1992	Prevent birth defects.	Tetracycline is a known teratogen.
5. If isotretinoin is prescribed, there must be documentation of severe acne (papules, pustules, cysts and nodules) and failure of previous therapy.	III	Vernon and Lane, 1992; Glassman et al., 1993; Weston and Lane, 1991; Nguyen, 1994	Improve acne; decrease psychological effects of acne; and, decrease potential physical scarring.	Isotretinoin has severe teratogenic effects and potential for liver toxicity. Its use should be restricted to those with severe, recalcitrant nodulocystic acne.

6. If isotretinoin is prescribed, a negative serum pregnancy test should be obtained within two weeks of start of therapy.	III	Vernon and Lane, 1992; Glassman et al., 1993; Weston and Lane, 1991	Prevent teratogenic effects to fetus.	Isotretinoin has severe teratogenic effects.
7. If isotretinoin is prescribed, there should be documentation that counseling regarding use of an effective means of contraception (including abstinence) was provided.	III	Weston and Lane, 1991	Prevent teratogenic effects to fetus.	Isotretinoin has severe teratogenic effects.

Follow-up

Indicator	Quality of evidence	Literature	Benefits	Comments
8. If isotretinoin is prescribed, monthly serum pregnancy tests should be performed.	III	Vernon and Lane, 1992; Glassman et al., 1993; Weston and Lane, 1991	Prevent teratogenic effects to fetus.	Isotretinoin has severe teratogenic effects.
9. If isotretinoin is prescribed, monthly liver function tests should be performed.	III	Glassman et al., 1993	Prevent liver disease.	Isotretinoin has the potential effects on the liver such as toxicity or failure.

Quality of Evidence Codes:

- I: RCT
- II-1: Nonrandomized controlled trials
- II-2: Cohort or case analysis
- II-3: Multiple time series
- III: Opinions or descriptive studies

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