

1. ACNE¹

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The general approach to summarizing the key literature on acne was to review relevant sections of two medical text books (Vernon and Lane, 1992; Paller et al., 1992) as well as journal articles chosen from a MEDLINE search of all English language articles published between the years of 1990 and 1997 on the treatment of acne.

IMPORTANCE

Acne is the most common skin disorder seen in the United States, affecting approximately 17 million persons (Tolman, 1992). Acne can persist into mid-adulthood in some persons, and can also present initially in adulthood. Overall, acne affects approximately ten 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. Furthermore, in severe cases, acne can lead to physical scarring which may exacerbate the emotional effects of the disease.

SCREENING

Screening patients for acne is not recommended.

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,

¹ This chapter is a revision of one written for an earlier project on quality of care for women and children (Q1). The expert panel for the current project was asked to review all of the indicators, but only rated new or revised indicators.

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).

With the aim of guiding treatment, Vernon and Lane (1992) and Glassman et al. (1993) recommend the following history elements in diagnosing acne (Indicator 1):

- age at onset of acne;
- location (face, back, neck, chest);
- aggravating factors (stress, seasons, cosmetics, creams);
- 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).

Location, previous treatment, and potentially aggravating medications were felt to be especially important.

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 four to six 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 or benzoyl peroxide; <i>and</i> oral antibiotics
Severe Nodulocystic Acne - red papules, pustules, cysts and nodules	Topical tretinoin; benzoyl peroxide or topical antibiotic; oral antibiotics; <i>and</i> consider isotretinoin

Source: Adapted from Weston and Lane (1991), Vernon and Lane (1992) Nguyen (1994), and 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, 1992; 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, 1992; Vernon and Lane, 1992). Improvement of acne after treatment of tretinoin can take six to 12 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 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, 1992; Nguyen, 1994). Some percutaneous absorption may rarely occur with clindamycin, resulting in diarrhea and colitis (Weston and Lane, 1992; Nguyen, 1994). Topical antibiotics are frequently used in combination with keratolytics and are most useful for maintenance therapy if improvement after one to two months of oral antibiotics is observed (Weston and Lane, 1992).

Oral Antibiotics

Patients with moderate to severe inflammatory acne will require oral antibiotics in addition to topical therapy (Indicator 2). Tetracycline and erythromycin are the most commonly used systemic antibiotics. Minocycline is also effective with more convenient dosing; however, its cost limits its use to those patients with severe or recalcitrant acne (Nguyen, 1994; and Glassman et al., 1993).

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, 1992). Because of its severe teratogenicity, isotretinoin should be avoided during pregnancy (Weston and Lane, 1992). 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 (Indicator 4). Up to ten percent of patients experience mild hair loss, but the effect is reversible (Weston and Lane, 1992). Because of the seriousness of these side effects, isotretinoin should be reserved for patients with severe acne who have failed previous therapy (Indicator 3)(Glassman et al., 1993; Nguyen, 1994; Vernon and Lane, 1992; and Weston and Lane, 1992).

FOLLOW-UP

Follow-up visits for acne should be scheduled initially every four to six weeks. Ideal control is defined as no more than a few new lesions every two weeks (Weston and Lane, 1992).

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RECOMMENDED QUALITY INDICATORS FOR ACNE

The following indicators apply to men and women age 18 and older who have acne. These indicators were endorsed by a prior panel and reviewed but not rated by the current panel.

Indicator	Quality of Evidence	Literature	Benefits	Comments
Diagnosis				
1. For patients presenting with a chief complaint of acne, the following history should be documented in their chart: a. location of lesions (back, face, neck, chest), b. previous treatments, and c. medications and drug use.	III	Glassman, et al., 1992; Vernon and Lane, 1992	Improve acne; decrease psychological effects of acne; 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				
2. If oral antibiotics are prescribed, papules and/or pustules must be present.	III	Vernon and Lane, 1992; Glassman et al., 1993; Weston and Lane, 1992	Improve acne; decrease psychological effects of acne; 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. If isotretinoin is prescribed, there must be documentation of cysts and/or nodules.	III	Vernon and Lane, 1992; Glassman et al., 1993; Weston and Lane, 1992; Nguyen, 1994	Improve acne; decrease psychological effects of acne; decrease potential physical scarring.	Isotretinoin has potential for liver toxicity. Its use should be restricted to those with severe, recalcitrant nodulocystic acne.
Follow-up				
4. If isotretinoin is prescribed, monthly liver function tests should be performed, for three months.	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