

Acne

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Acne Overview

Acne is an inflammatory disorder of pilosebaceous units, with characteristic lesions including open (black) and closed (white) comedones, inflammatory papules, pustules, nodules, cysts, and possible scarring (Figure 1). Etiology of acne is multifactorial and includes abnormal follicular keratinisation, increased sebum production secondary to androgens, *Propionibacterium acnes* (*P.acnes*) bacteria proliferation, and inflammation. Acne has a significant impact on patient quality of life, affecting self-esteem and psychosocial development. The goal of acne treatment is to reduce severity and recurrences of skin lesions, as well as to prevent scarring. An approach to managing acne is outlined.

Topical Therapies

Retinoids

The main target of acne treatment is the microcomedone. Topical retinoids act on follicular keratinocytes, preventing follicular blockage and should be considered for all patients with acne. They may also reduce the release of pro-inflammatory cytokines. The most common side effect of topical retinoids is irritation, thus patients should always be instructed to apply small amounts. Continuous maintenance therapy can prevent flares. Topical retinoids commonly available are adapalene (e.g. Differin 0.1% and DifferinXP gel 0.3%) and tretinoin (e.g. Retin-A, Retin-A micro, Vitamin A acid gel) and Tazarotene (e.g. Tazorac).

Antimicrobials

Topical antimicrobials are effective in the treatment of inflammatory acne and include benzoyl peroxide (BP) and antibiotics. BP is a bactericidal agent that prevents *P. acnes* resistance to antibiotic therapy. It also has moderate comedolytic and anti-inflammatory properties. It is available in a variety of topical preparations ranging from 2.5% to 10%. Patients should be warned that fabrics that come into contact with BP, including towels, bed sheets, and clothing may be bleached.

Topical erythromycin and clindamycin (e.g. Clindasol, Clinda-T, Dalacin-T) can also be used. An important issue with topical antibiotic monotherapy is the development of antibiotic-resistant *Staphylococcus epidermidis* and *aureus*. Resistance can be minimized by using a topical antibiotic with BP.



Figure 1

Another new treatment option for acne vulgaris is topical dapsone (Aczone) 5% gel. It is an anti-neutrophilic drug that combines anti-inflammatory and antimicrobial effects.

Combination therapy

Combination acne therapy is typically more effective than either agent used alone and is often used as monotherapy. Common topical combination products used for acne include:

- Adapalene 0.1% and benzoyl peroxide 2.5%: Tactuo gel
- Clindamycin 1% and benzoyl peroxide 5%: Benzaclin gel and Clindoxyl gel
- Erythromycin 3% and benzoyl peroxide 5%: Benzamycin gel
- Clindamycin 1.2% and tretinoin 0.025%: Biacna gel
- Erythromycin 4% and tretinoin 0.01%/0.025%/0.05%: Stievamycin gel mild/regular/forte

The goal of acne therapy is to manage as many pathogenic factors as possible. Specifically, adapalene and benzoyl peroxide combination (Tactuo gel) is effective for the major acne factors (abnormal desquamation, *P. acnes* colonization, and inflammation) and avoids the issue of antibiotic use and resistance. According to current treatment guidelines from the Global Alliance to Improve Outcomes in Acne Group (Figure 2), the combination of topical retinoid and antimicrobial agent is the first-line therapy for acne, used as initial therapy and maintenance. Topical or oral antibiotics are typically not recommended for maintenance therapy as they may increase the risk of antibiotic resistance.

Physical Therapies

Physical treatments for acne include comedone extraction, chemical peels, microdermabrasion and photodynamic therapy. Intralesional injections of corticosteroids may be used for the treatment of nodules and cysts. Injectable fillers, laser resurfacing, punch excisions, CROSS trichloroacetic acid therapy and subcision can improve the appearance of scarring.

**Global
Alliance
Acne
Treatment
Algorithm**
Figure 2

Acne Severity	MILD		MODERATE		SEVERE
	Comedonal	Mixed and Papular/ pustular	Mixed and Papular/ pustular	Nodular	Nodular/conglobate
1 st Choice	Topical Retinoid	Topical Retinoid + Topical Antimicrobial	Oral Antibiotic + Topical Retinoid ± BPO	Oral Antibiotic + Topical Retinoid + BPO	Oral Isotretinoin
Alternatives	Alt. Topical Retinoid or Azelaic acid or Salicylic acid	Alt. Topical Retinoid Antimicrobial Agent + Alt. Topical Retinoid or Azelaic Acid	Alt. Oral Antibiotic + Alt. Topical Retinoid ± BPO	Oral Isotretinoin or Alt. Oral Antibiotic + Alt. Topical Retinoid ± BPO/Azelaic Acid	High Dose Oral Antibiotic + Topical Retinoid + BPO
Alternatives for Females	See 1 st Choice	See 1 st Choice	Oral Antiandrogen + Topical Retinoid/ Azelaic Acid ± Topical Antimicrobial	Oral Antiandrogen + Topical Retinoid ± Oral Antibiotic ± Alt. Antimicrobial	High Dose Oral Antiandrogen + Topical Retinoid ± Alt. Topical Antimicrobial
Maintenance Therapy	Topical Retinoid		Topical Retinoid ± BPO		

BPO: benzoyl peroxide

Systemic Therapies

Systemic therapies for acne include oral antibiotics, hormonal therapies for women (e.g. combined oral contraceptives, spironolactone), and isotretinoin. Oral isotretinoin is typically considered in moderate and severe acne, scarring, and inadequate improvement with systemic antibiotics or hormonal therapy.

Systemic antibiotics

In cases of moderate to severe acne, systemic antibiotics are often considered the next line of care, used in combination with topical regimen and typically prescribed for 2-6 months. Doxycycline, minocycline and tetracycline are the most common oral antibiotics used. A response is usually seen after six weeks of therapy. If control is maintained for 2 months, the antibiotic may be stopped with continued use of only topical therapy. Due to increasing resistance, long-term use of systemic antibiotics in acne should be avoided.

Hormonal therapies

Hormonal therapies, such as estrogen-containing oral contraceptives, are effective second-line therapies in women with acne regardless of underlying hormonal abnormalities. Clinical observation suggests that deep-seated nodules on the lower face and neck are especially responsive to hormonal therapy. The choice of oral contraceptive should be based on patient tolerability and side effect profile.

The oral anti-androgen spironolactone (50-200mg/day) is a 5-alpha reductase inhibitor and can be used on its own in women of non-child bearing age, or can be added to an oral contraceptive if the OCP is insufficiently effective on its own.

Isotretinoin

Isotretinoin is unique in affecting all etiologic mechanisms of acne. Indications for isotretinoin include scarring disease, and less than 50% improvement with oral antibiotics or hormonal therapies after 4 months. Isotretinoin therapy must be monitored carefully because side effects include teratogenicity, hypertriglyceridemia and pancreatitis, hepatotoxicity, blood dyscrasias, and night blindness. Although a causal relationship is controversial, patients must be warned about depression, suicide risk, and inflammatory bowel disease, and monitored closely for these potential side effects. Prior to starting oral isotretinoin, patients should have baseline blood-work including pregnancy test for women, complete blood count, liver enzymes, renal function tests, and fasting lipids and triglycerides. This blood-work should be repeated monthly during therapy. Women of childbearing age should be on two forms of birth control during therapy and for 1 month following therapy.

Toronto Dermatology Centre specialty clinics:

- Acne & rosacea clinic
- Skin cancer clinic
- Psoriasis clinic
- Warts & molluscum clinic