Section 1: Epidemiology and aetiology

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit. It is characterised by seborrhoea, non-inflammatory and inflammatory lesions, and scarring.

Almost all teenagers can expect some degree of acne, with moderate to severe disease in about 15% of 15-17-year-olds.¹ Acne develops earlier in girls, but more boys are affected. Late-onset acne (>25 years) is seen in 8% of patients and significant lesions are seen in 1% of men and 5% of women at the age of 40.²

Aetiology

Four main factors are involved:

- Increased sebum (dependent on androgen drive or increased androgen receptor sensitivity)
- Abnormal keratinisation
- Colonisation of pilosebaceous duct by Propionibacterium acnes
- Inflammation

Genetic factors play a part. There is a high concordance between monozygotic twins and a greater risk of severity is associated with a positive family history, maternal acne being associated with the greatest risk.¹,³

Acne is associated with increased insulin resistance and high serum dehydroepiandrosterone, which may explain its association with polycystic ovary syndrome (PCOS).

Abnormal androgen production drives acne in Cushing's syndrome, congenital adrenal hyperplasia, patients using anabolic steroids and virilising tumours in females.

Factors that can cause acne to flare include menstruation, emotional stress, picking and smoking.⁴ Antiepileptics are associated with a monomorphic acne rash and it has been suggested the severity of the acneiform eruption produced by the chemotherapy drug erlotinib may correlate with increased survival.⁵

There is little evidence to support the belief that diet or sunlight affect acne. There is also limited data on the natural history of acne and more longitudinal studies are needed to identify factors that may predict persistence into adulthood.
Other less common forms of acne are shown in table 1.

<table>
<thead>
<tr>
<th>TABLE 1: LESS COMMON FORMS OF ACNE</th>
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<tbody>
<tr>
<td><strong>Pomade acne</strong></td>
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<tr>
<td><strong>Tropical acne</strong></td>
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<tr>
<td><strong>Chloracne</strong></td>
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<tr>
<td><strong>Acne conglobata</strong></td>
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</table>

**Section 2: Making the diagnosis**

Acne is a clinical diagnosis. The distribution corresponds to areas with the densest population of pilosebaceous units, such as the face (99%).

Comedones may be open (blackheads) or closed (whiteheads) and show no clinical inflammation.

Inflammatory lesions may be superficial (papules or pustules) or deep (pustules or nodules) and are raised erythematous lesions.

Nodulocystic acne is a severe form consisting of comedones, inflammatory lesions and large nodules, with a high risk of scarring.

Scarring may occur with superficial or deep lesions in scar-prone patients and may be described as ice-pick, depressed fibrotic, atrophic, hypertrophic or keloidal. Deeply pigmented skin is more susceptible to persistent postinflammatory hyperpigmentation.

Acne fulminans, a severe form, is associated with fever, arthralgia and lymphadenopathy. Acne carries a significant psychological morbidity.

Further investigations may be needed in these cases:

- **PCOS in females with hirsutism or dysmenorrhoea.** Bloods, including testosterone, SHBG, LH:FSH ratio, TSH, lipids; pelvic ultrasound.
- **Prepubertal patients with signs of virilisation.** Bloods, including TFTs, testosterone, dehydroepiandrosterone sulphate, androstenedione and 17-hydroxyprogesterone.
- **Skin swabs if Gram-negative folliculitis is suspected.**

<table>
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<th>DIFFERENTIAL DIAGNOSIS</th>
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<tr>
<td><strong>Rosacea</strong></td>
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<tr>
<td>Characterised by facial flushing induced by heat, alcohol or spicy food</td>
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<tr>
<td>Features include erythema,</td>
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<td><strong>Milia</strong></td>
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<tr>
<td>May be confused with white-heads but appear whiter</td>
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</tbody>
</table>
telangiectasia, inflammatory papulopustular eruption
Lacks comedones, nodules, cysts or scarring
Central facial distribution
Ocular involvement
May coexist with acne
Perioral dermatitis
Often preceded by a history of topical steroid use
Red papules in nasolabial folds and perioral area

No central punctum

**Folliculitis**
Pustular lesions of beard area or trunk
Swabs usually yield Staphylococcus aureus
Pityrosporum folliculitis predominantly on trunk
Gram-negative folliculitis occurs following long-term antibiotic therapy and may complicate acne treatment

**Section 3: Managing the condition**
Treatment is based on disease severity, extent and patient factors (table 2). Most commonly, combinations are used to address comedonal and inflammatory components.

<table>
<thead>
<tr>
<th>TABLE 2: SUMMARY OF ACNE TREATMENT</th>
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<tbody>
<tr>
<td><strong>Mild acne</strong></td>
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<tr>
<td>Comedonal</td>
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<tr>
<td>Papulopustular</td>
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<tr>
<td></td>
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<tr>
<td><strong>Moderate acne</strong></td>
</tr>
<tr>
<td>Papulopustular/nodular</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Severe acne</strong></td>
</tr>
<tr>
<td>Nodulocystic or unresponsive to antibiotics</td>
</tr>
</tbody>
</table>

**Mild acne**
Topical retinoids (for example, adapalene, tretinoin) are antiproliferative and used to treat comedonal acne. Available as gels and creams, they should be applied once or twice daily. They are recommended first-line for maintenance and can be continued indefinitely and combined with topical antibiotics or benzoyl peroxide (BPO). All retinoids are contraindicated in pregnancy.

BPO, a non-antibiotic antimicrobial agent, can be used on its own or in combination for mild acne. BPO (2.5-5% strength) should be started at a low frequency (such as three times a week) and titrated up to daily use, to reduce irritation.

Topical antibiotics, such as clindamycin and erythromycin, are commonly used, but monotherapy should be avoided to prevent resistance developing. Topical antibiotics should be combined with BPO or a retinoid for best results.

Topical azelaic acid can be used alone or with a topical retinoid for mild papulopustular disease.
**Moderate acne**

The key to success in moderate acne is to combine treatments to treat both the comedonal and the inflammatory components. A typical combination is an oral antibiotic with a topical retinoid and BPO. Tetracyclines are usually used first-line, in particular tetracycline and doxycycline, both of which offer the added convenience of once-daily dosing.

Minocycline is best avoided because it has a higher incidence of adverse effects compared with other tetracyclines. Oral erythromycin (500mg twice daily) or trimethoprim (300mg twice daily) are useful alternatives. Resistance to oral antibiotics can be minimised by using topical BPO concurrently.

In young women requiring contraception or with features of PCOS, an anti-androgenic combined oral contraceptive is recommended as part of combination therapy (either with or without an oral antibiotic), along with a topical agent.

In older women, or if estrogens need to be avoided, spironolactone is an alternative when used with contraception.

**Severe acne**

Severe acne includes nodulocystic acne and acne that has failed to respond to at least two categories of oral antibiotics.

In such patients, oral isotretinoin is most effective, inducing long-term remission in about 90% of cases. Isotretinoin significantly reduces sebum production, prevents comedone formation, reduces P acnes colonisation and is anti-inflammatory.

It is usually prescribed in secondary care, owing to its side-effects and teratogenicity. Women of childbearing age must use contraception during and after treatment.

**Antibiotic resistance**

Increasing concern about antibiotic resistance has driven attempts to limit the frequency and duration of antibiotic use in acne.

Resistance manifests in acne as reduced/no response or relapse. BPO is strongly bactericidal and its addition to antibiotic therapy minimises resistance at sites of application.

Light and laser therapy can improve inflammatory acne in the short term. Pain, erythema, swelling and hyperpigmentation are common side-effects. More comparative data and longer outcome studies are needed to define their role.

**Section 4: Prognosis**

Most patients can be managed in primary care. The treatment combinations should be tried for approximately three months and their effect then assessed. Effective treatment should be continued for six months, then re-evaluated.

Patients with nodulocystic acne should be referred to secondary care for consideration of oral isotretinoin and commenced on oral antibiotic treatment in the meantime. NICE has further recommendations about referral (see section 6).
Acne usually resolves by the age of 25, but persistent disease is seen in 4% of people aged 40-49. Scarring can be more disabling than the acne itself. The best way to reduce scarring is to treat the acne early and to continue therapy for as long as necessary.

**Section 5: Case study**

A 12-year-old girl was brought in by her mother, who was worried that ‘teenage spots’ were making her daughter self-conscious and affecting her confidence.

The patient had used OTC preparations containing BPO, but with no improvement. She had no other medical conditions and had not yet reached menarche.

Examination revealed mostly closed comedones (whiteheads) on the forehead and jawline, with occasional papules on the cheeks.

Treatment was started with a combination adapalene and BPO gel, with instructions to apply it on alternate nights for two weeks before increasing to every night if tolerated. On review after two months, there was no improvement and there were more papules and some pustules present. Lymecycline 408mg daily was added to the regimen.

At the next two-month review, there was significant improvement. She was advised to continue both topical and oral treatment for a further four months. After that, there was minimal acne, although she had started menstruation and reported occasional perimenstrual spots.

She was advised to continue topical treatment and to return if she developed further papules or pustules.

Six months later she had more severe acne, which was not related to her menses. She had some early scarring on her cheeks, which was making her worried that she would have permanent scarring.

She was advised to avoid squeezing the spots and started on trimethoprim 300mg twice daily in conjunction with her adapalene/BPO gel. She was also referred to the dermatology department to consider oral isotretinoin in view of her scar risk.

When she was seen two months later in secondary care she was considered to be a suitable candidate for oral isotretinoin as she had not cleared on her second category of oral antibiotic. She was switched to oral isotretinoin monotherapy on a low dose for eight months (to minimise side-effects). This cleared her acne completely and there has been no relapse for the past two years.

**Section 6: Evidence base**

**Guidelines**

- **UK Clinical Knowledge Summary. Acne vulgaris.** [www.cks.nhs.uk/acne_vulgaris](http://www.cks.nhs.uk/acne_vulgaris)
  Last updated in May 2012, this website provides quick access to a range of information about acne management and prescribing, and summarises the underlying evidence.

  This article provides a more in-depth review of all of the current evidence pertaining to new developments in acne management.

  The authors provide some useful short summaries of the current data. There is also a succinct treatment algorithm.

- **NICE. Referral Advice.** A guide to appropriate referral from general to specialist services. [www.nice.org.uk/media/94D/BE/Referraladvice.pdf](http://www.nice.org.uk/media/94D/BE/Referraladvice.pdf)
  Summarises information on when to refer to secondary care.
  Summaries of acne pathogenesis, diagnosis and treatment.


  Contributed by Dr Anshoo Sahota, consultant dermatologist, Whipps Cross University Hospital and Barts and the London NHS Trust.

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### CPD IMPACT: EARN MORE CREDITS

These further action points may allow you to earn more credits by increasing the time spent and the impact achieved.

- Audit patients on topical antibiotics and consider adding BPO or retinoids if needed after review.
- Discuss a practice protocol for prescribing in acne vulgaris and agree a formulary for prescribing.
- Review patients of childbearing age using retinoids and ensure they have been given appropriate advice about the use of contraception during their treatment.
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### References


3. Walton S, Wyatt E, Cunliffe WJ.


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