Devon Local Pharmaceutical Committee

PHARMACY the Heart of our Community

Acne Vulgaris Medicines Consultation Toolkit

Introduction

Acne is a very common skin condition, which affects more than 80% of people at some point in their life.[1] Furthermore, it is a chronic condition, which along with eczema and psoriasis, accounts for 70% of all cases of skin conditions in the UK.[2] Acne affects the face, and in many cases also the chest and back. Most commonly occurring in patients in their mid to late-teens, and normally lasting for two or three years, but in a small number of patients it can persist for much longer. It is an inflammatory condition associated with papules, pustules, comedones and nodules, which, unless the condition is mild, can lead to scarring.[1] Whilst the condition only tends to persist for a few years, treatment is important in order to reduce both scarring and the effects acne has on the psychological and social wellbeing of sufferers, which can be considerable.[1,3]

The guidance document 'Quality Standards for Dermatology', produced by NHS Primary Care Commissioning in July 2011, proposes that patients with manageable skin conditions should be supported with high-quality information to empower self-care and self-management; community pharmacists were specifically mentioned as a source of such support.[4] The goal of this toolkit is to provide pharmacists with the information to provide high-quality information during a patient consultation (for example Medicines Use Review).

The purpose of an MUR for patients with acne is to improve their knowledge of the condition, and of their medication and how to use it, by:

- establishing the patient's use, understanding and experience of using their medication;
- identifying, discussing and resolving poor or ineffective use of medication by the patient;
- identifying side-effects and medication interactions that may affect the patient's adherence, and
- improving the clinical and cost-effectiveness of medication prescribed to patients, thereby reducing the wastage of such medication.[5]

Why should pharmacists review patients with acne?

Acne is easily treated, and yet where it is poorly managed, morbidity can be high. Acne can cause permanent disfigurement, pain, loss of confidence, and impairment of normal social and workplace function, with documented effects on quality of life including depression, dysmorphobia, and suicide.[1]

Furthermore, there are many false beliefs about acne; that it is caused by poor hygiene, a poor diet, or that it is an infection. Poor adherence can cause treatment failure, but is common due to a lack of understanding about the long period of treatment needed before symptoms improve. Side-effects, particularly skin irritation, and initial worsening of symptoms with retinoids, further reduce adherence; but many side-effects could be overcome through educating patients about better ways of using their medicines.[1,3,6-8]

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Learning objectives

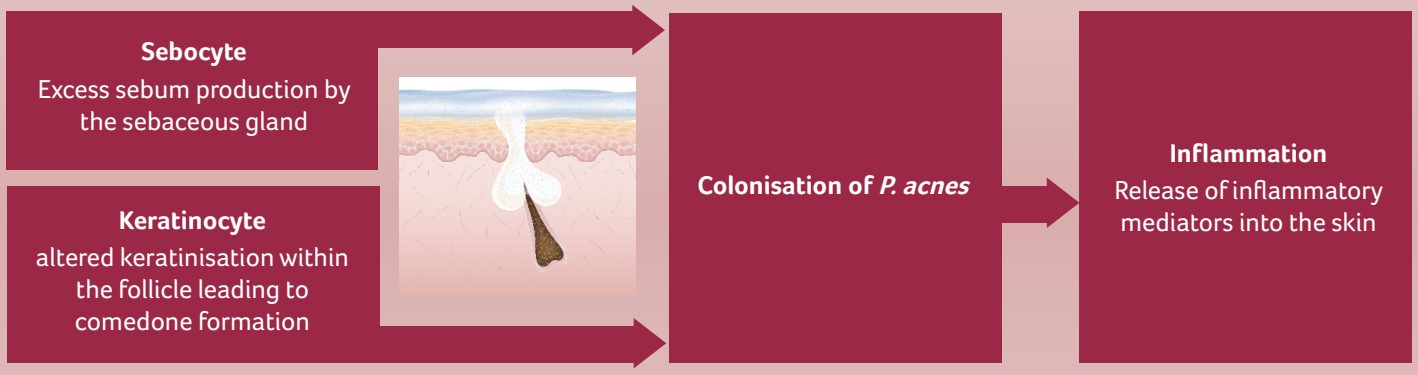
1. Update knowledge of acne.
2. Identify treatments for the management of acne.
3. Understand the range of discussion points and potential interventions that may be appropriate in order to offer a comprehensive consultation for patients with acne.
4. Be able to confidently undertake high-quality consultations for patients with acne.

About acne

Acne is characterised by five types of lesions:

1. Open comedones ('blackheads') and closed comedones ('whiteheads'): Develop from micro-comedones, formed when the sebaceous glands of people prone to acne react to elevated levels of testosterone during puberty. Testosterone stimulates the production of excess oil (sebum), enlargement of the sebaceous glands and the dead cells lining the pore not shedding properly, leading to plugs of greasy keratin getting stuck in the opening of a sebaceous gland. This blocked enlarged follicle is a micro-comedone, which can become an open or closed comedone, the non-inflammatory lesions which are associated with all severities of acne (see figure 1).

Figure 1: Pathogenesis of acne



Propionibacterium acnes, which lives naturally on everyone's skin, starts to flourish in a comedone of patients prone to acne, due to the lipid-rich anaerobic environment. As *P. acnes* thrives an inflammatory response is triggered, leading to the follicle rupturing, allowing *P. acnes* proliferation to extend to the surrounding tissue resulting in the formation of inflammatory lesions: pustules, papules, nodules and cysts (see figure 1).

2. Pustules: Pus-filled spots. Pustules occur in all types of acne, but tend to be few in number in mild acne.
3. Papules: Small elevated solid lesions, which develop in the same way as a pustule, but are associated with more inflammation, and may lead to scarring. Papules occur in all types of acne, but tend to be occasional and few in number in mild acne.
4. Nodules: Larger elevated solid lesions, which are greater than 5mm wide and deep, and are associated with a high risk of scarring. Nodules are not associated with mild acne, occur occasionally in moderate acne, but are widespread in severe acne.
5. Cysts: An abnormal swelling containing keratin and sebum. Mainly limited to severe acne, and like nodules are associated with a high risk of scarring.[1,3,6-9]

The quantity of these different lesions affecting the skin are the main tool for classifying acne:

- **Mild:** This is a non-inflammatory or mildly inflammatory form of acne, mainly consisting of comedones, with a few inflammatory lesions (papules or pustules) – Lesion count: Less than 20 comedones, fewer than 15 inflammatory lesions, or less than 30 lesions in total.
- **Moderate:** Mainly inflammatory lesions, occasionally nodules, and there may be mild scarring – Lesion count: 20-100 comedones, 15-50 inflammatory lesions, or 30-125 lesions in total.
- **Severe:** Widespread inflammatory lesions, with extensive nodules and cysts, and with scarring; [8,10] also, moderate acne that has not improved by six months of treatment, or any severity of acne causing serious psychological upset is also defined as severe – Lesion count: More than 5 cysts, more than 100 comedones, more than 50 inflammatory lesions, or more than 125 lesions in total.

Scarring

Small depressions and mild discoloration may last for six to 12 months, but usually settle, with discolouration being more noticeable on darker skin. The upper chest and shoulders are more prone to hypertrophic (keloid) scars, which tend not to persist for longer than a year. Atrophic ("ice pick") scars normally occur on the face and tend to persist, although in a small number of cases their appearance may improve to some degree over many years.[1,6] Whilst some hypertrophic scars that do persist can be improved by carefully monitored use of topical corticosteroids, generally scars require surgical intervention or specialist laser treatment to improve their appearance.[6]

To try and reduce the risk of scarring, lesions should not be picked or squeezed. Obsessive picking of lesions can cause an exacerbated version of the condition associated with extensive scarring called acne excorieè, which is most common in depressed young female patients.[7-9]

The management of acne

The aim of management is to reduce the presence and impact of acne, including psychosocial impact and scarring.[1,3]

Treatment should be started as soon as possible and reviewed after treatment starts to take effect, at 6 to 8 weeks, and then, as long as treatment is beneficial, it can be continued for 4 to 6 months before being reviewed again.[1,3,6,8-11] When a new treatment is prescribed it is essential that the patient understands that it can take 6 to 8 weeks for the benefits to become evident. The prescriber does not need to see them before the 6-8 weeks have elapsed; so they need to persevere with the treatment, using it regularly and as prescribed. At the review, the effectiveness and tolerability, and the impact of these on adherence, needs to be assessed.[1,3,6,8-11]

In the absence of a national clinical guideline for the management of acne, the Primary Care Dermatology Society (PCDS) and NICE Clinical Knowledge Summaries (CKS) offer stepwise recommendations for the management of acne. Both guidelines are referred to below, however they use differing classifications of acne severity; CKS classifies acne as mild, moderate and severe, where as PCDS differentiates comedonal acne from mild acne, to have a total of four classifications for the condition.[6,9]

Managing mild acne (and comedonal acne) - topical treatments only

PCDS advise using a topical retinoid: adapalene (or combination product with benzoyl peroxide) or (iso)tretinoin applied once daily first line to manage comedonal acne, with azelaic acid being reserved for second line treatment. Topical treatments are initially applied two to three times a week, and increased to once every day as tolerated.[6] For mild papular/pustular acne, they recommend a fixed dose combination topical treatment, which includes two of a topical antibiotic, a topical retinoid and benzoyl peroxide (see figure 2). Treclin®, Duac® and Epiduo® are cited as specific examples of appropriate treatments.[6]

For mild acne, CKS advise the use of a topical retinoid or benzoyl peroxide first line, with azelaic acid being reserved as second line, the guideline highlights that combination therapy is unlikely to be necessary for mild acne.

Where treatment failure does occur, CKS recommend:

- Where skin irritation is a problem; decreasing the strength of treatment, using a less irritant formulation, or using a less irritant treatment, either azelaic acid or a topical antibiotic.
- Where adherence is not a problem; increasing the strength or frequency of application of the treatment, using a topical antibiotic combined with either benzoyl peroxide or a topical retinoid, or using a topical retinoid combined with benzoyl peroxide (may be poorly tolerated due to skin irritation).[9]

CKS also recommend the use of a standard combined oral contraceptive for female patients with acne, particularly when the condition is having a negative psychosocial impact.[9]

Benzoyl peroxide and topical retinoids both cause skin irritation and this can be reduced by taking a short break from treatment until irritation subsides. Treatment can be applied on alternate days, and an oil-free moisturiser can be applied 30-60 minutes after application. Additionally, PCDS suggests the use of hydrocortisone 1% cream twice daily for five days.[1,3,6,9,11] There is a risk of teratogenicity with topical retinoids and they should not be used during pregnancy, female patients using topical retinoids should use effective contraception for the duration of treatment.[1,3,11]

Topical antibiotics cause less irritation than both topical retinoids and benzoyl peroxide, but pose the risk of resistance and sensitisation, combinations of a topical antibiotic with a non-antibiotic topical treatment are effective alternatives to oral antibiotics with less risk of systemic side-effects or resistance.[1]

Managing moderate acne

In moderate acne, PCDS advise first line combining a topical retinoid with an oral antibiotic, azelaic acid is reserved for second line use. Tetracyclines are recommended first line, either doxycycline 100mg daily or lymecycline 408mg daily. Oxytetracycline 500mg twice daily is mentioned as a lower cost option, but it is noted that adherence may be poorer due to twice daily dosing and that it is less effective in some patients. Minocycline is advised against due to the risk of hepatotoxicity and lupus-like reactions. Erythromycin (can be considered in pregnancy) and clarithromycin are mentioned as second line options.[6]

PCDS also recommend, where not contraindicated, the addition of co-cyprindiol to the treatment of female patients with moderate or severe acne.[6]

In moderate acne, CKS initially recommend:

- **For acne limited to the face that is unlikely to scar:** A topical retinoid or benzoyl peroxide first line, with azelaic acid being reserved for second line.
- **For acne that is more likely to scar:** A topical antibiotic combined with either benzoyl peroxide or a topical retinoid, or as an alternative a topical retinoid combined with benzoyl peroxide (may be poorly tolerated due to skin irritation).
- **For extensive acne affecting the back and shoulders, or where there is a higher risk of scarring or pigmentation change:** Add on an oral antibiotic to the topical treatment. The choice is the same as that offered by PCDS, although oral clarithromycin is not mentioned.[9]

In addition, where treatment failure occurs with the initial treatment, CKS go on to further recommend:

- Where adherence is a problem; decreasing the strength of treatment, using a less irritant formulation, or using a less irritant treatment, either azelaic acid or a topical antibiotic.
- Where adherence is not a problem; increasing the strength or frequency of application of the treatment may be appropriate, prescribing a combined topical treatment for patients using a single topical treatment, or using an oral antiobiotic combined with either a topical retinoid or benzoyl peroxide.
- Where treatment failure occurs to the combination of oral antibiotics with a topical treatment, after a 2-3 month trial, specialist advice should be sought with regards to the choice of antibiotic or female patients could also be prescribed co-cyprindiol until 3-4 months after acne has resolved.[9]

Tetracyclines can harm developing bones and teeth so should be avoided in children under 12, and in pregnant or breastfeeding women, and if used in women of childbearing age should use adequate contraceptive protection.[1,3,6] Due to the gastro-intestinal side-effects associated with erythromycin, and the high levels of resistance to it, it is best reserved for those patients who do not tolerate tetracyclines, or for whom tetracyclines are inappropriate.[1,3,6] Regardless of the choice of oral antibiotic, if it is tolerated and effective, it should be used for at least 3 months, and continued until there is a sustained improvement, or up to 6 months of treatment, then stepped down to topical treatments.[6,9]

Figure 2: Table of available topical combination therapies[12,13]

Name	Vehicle	Antibiotic	Retinoid	Benzoyl peroxide	Application Regimen	Cost
Aknemycin® plus	Alcoholic solution	Erythromycin 4%	Tretinoin 0.025%	-	Once or twice daily	£7.05 for 25ml
Duac® Once daily	Gel	Clindamycin 1%	-	3%	Once daily	£13.14 for 30g
Duac® Once daily	Gel	Clindamycin 1%	-	5%	Once daily	£10.95 for 25g; £21.89 for 50g
Epiduo®	Gel	-	Adapalene 0.1%	2.5%	Once daily	£17.91 for 45g
Isotrexin®	Gel	Erythromycin 2%	Isotretinoin 0.05%	-	Once or twice daily	£7.47 for 30g
Treclin®	Gel	Clindamycin 1%	Tretinoin 0.025%	-	Once daily	£11.94 for 30g

Managing severe acne

PCDS advise for early referral to a consultant dermatologist for patients with severe acne.[6]

CKS guidance agrees but, highlights treatment with the combination of an oral antibiotic combined, as before, with either a topical retinoid, benzoyl peroxide, or second line, azelaic acid, whilst waiting for the referral appointment.[9]

Both PCDS and CKS recommend, where not contraindicated, the addition of co-cyprindiol to the treatment of female patients with severe acne.[6,9]

Patients with severe acne are assessed by consultant dermatologists for the appropriateness of oral isotretinoin, which, due to the range of serious adverse effects posed, is only prescribed by consultant dermatologists.[1,6]

The Acne MUR consultation

MUR questions and prompts	Key Messages
How are you getting on with your medicines? Talk me through your medicines. Do you ever take medicines that you have purchased, either from a pharmacy or anywhere else?	• Discuss the condition as well as the treatment, reassuring patients that acne will eventually clear as they get older, usually without significant scarring, however you should avoid trivialising it.[9] • Highlight that if the condition is to be controlled treatment needs to be adhered to until acne resolves in time.[1,3] • Reassure that acne is a very common skin condition that is not due to an infection, poor hygiene or a poor diet.[1,3,7-11] • Light, non-greasy/acnegenic/comedogenic moisturisers and make up do not worsen acne, in fact such a moisturiser can reduce dryness and irritation caused by benzoyl peroxide and topical retinoids.[1,11]
How do you use each of these medicines? How do you take/apply each medication/preparation? When and how often do you take/apply each medication/preparation? How long do you use each medication/preparation for?	• Highlight that it can take at least 6-8 weeks for treatments to have any effects on acne, so they need to be used persistently and continuously to find out if they work. It may take longer to reach their full effect but if treatments are adhered to and have no effect after 2 months patients should see their prescriber, whilst effective treatments require continued adherence.[1,3,6-11] • Highlight that topical treatments help control acne rather than getting rid of individual 'spots' so should be applied to all the affected areas rather than just to existing lesions.[3] • If topical treatments are new, recommend they are initially applied two to three nights a week, and the frequency of application increased to every night as tolerated.[6]
Do you have any problems or concerns with your medicines? How do you feel about using these medicines/preparations? Do you have any concerns about using these medicines/preparations?	• See note above in previous section – it can take at least 6-8 weeks for treatments to have any effects on acne.[1,3,6-11] • A light non-greasy moisturiser can be applied 30-60 minutes after applying topical treatments that irritate or dry the skin, to reduce this.[11] • If unmanageable skin irritation occurs with topical preparations, treatment can be stopped for a few days until the skin settles and then restarted with less frequent application (alternate day application may be considered if already applying only once daily).[1,3,6,9,11]

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MUR questions and prompts	Key Messages
Do you think they are working? Is this different from what you were expecting? Do you know why this medicine/preparation has been prescribed to you? Tell me in your own words what you think it is for. Do you think it works? Do you know how it works?	
Do you think you are having any side-effects or unexpected effects? Describe those effects for me.	
People often miss using their medicines at times for a wide range of reasons. Have you missed a dose or application of your medicine or changed when, or how often, you use it? How and when do you take/apply your medicines/ preparations? How often have you not taken or applied your medicines in the last two weeks? Why? Do you ever change the way in which you use it? When do you change it and why?	• See notes on previous page – a light non-greasy moisturiser can be applied 30-60 minutes after topical treatments to reduce irritation.[11] • See notes on previous page – if skin irritation occurs with topical preparations, treatment can be stopped for a few days then restarted with less frequent application.[1,3,6,9,11]
Do you have anything else that you would like to ask about your medicines or is there anything that you would like me to go over again? Are you happy with the information you have about your condition and medicines? Has your doctor given you any information on the use of your medicines? Have you been given any written information about your condition and medicines? Have you got information on your condition and medicines from any other source (for example, the internet)?	• Read the leaflets provided with each preparation. • Signpost to the websites on the main document. • Return to the pharmacy if you have any questions and problems. • Reinforce verbal advice with written information, such as the British Association of Dermatologists leaflet for patients with acne, or Patient UK resources.[7,9] • Warn against over washing, scrubbing the skin or using abrasive cleansing products, as acne is not caused by not washing the skin enough or properly this will not improve acne but will dry and irritate skin.[1,3,9] • Similarly warn that excessive exposure to UV light from sunbathing or sunlamps has little benefit but can dry and damage skin.[9] • Remind that inflammatory lesions should not be picked or squeezed as this aggravates and increases the risk of scarring and secondary infection.[1,7-9]

Treatments prescribed for acne

NB. It can take 6-8 weeks for any treatment to start to improve acne, and it may take even longer for some treatments to reach their full effect, so they need to be used persistently and continuously to find out if they will benefit an individual.[1,3,6-11]

Treatments	How it works	Advantages	Disadvantages	Optimisation
Topical Retinoids Tretinoin, isotretinoin or adapalene. Adapalene is a third-generation retinoid that is better tolerated.[8,11] A more recent formulation of tretinoin is now available and which has good tolerability vs adapalene[14]	Comedolytic agent: Prevent the formation of comedones. As comdeones are the precursor to inflammatory lesions they in-turn prevent these forming as well.[8,11]	The most effective topical treatment for preventing the formation of comedones (comedolytic).[8,11] Comedones are pre-requisite to inflammatory lesion, hence topical retinoids are effective in reducing the formation of such lesions.[8,11] Initial redness and peeling often settles in time.[1,3,11] Topical retinoids in conjunction with another treatment, particularly antibiotics, make the most effective combinations, with faster and more significant results.[6,8,9,11]	Dose-related irritation of the skin (peeling, burning, erythema) requires careful counselling and the slow increase of both strength and application frequency to prevent side-effects and related adherence issues.[1,3,6,8,9,11] Initial worsening of acne may occur for the first few weeks of treatment.[1,3,11] Can cause photosensitivity and skin irritation.[1,3,8,11] Teratogenic: female patients need to use effective contraception (preferably two complementary forms) for the duration of treatment and one month after.[1,3,11] Oral retinoid, isotretinoin, is known to be teratogenic, and pregnany must be avoided. Topical retinoids are not recommended in fertile, sexually active females who are not taking precautions against falling pregnant. It make take up to three or four months for the maximum benefit to be seen.[8,11]	Avoid UV lamps and overexposure to sunlight due to sensitivity caused by topical retinoid, also using sunscreen and applying retinoid at night will manage this risk.[1,3,11] To reduce the risk of skin irritation, when treatment is initiated the frequency and potency of application can be slowly increased. Thereafter, if skin irritation occurs, treatment should be stopped until this settles and then recommenced with less frequent application.[1,3,6,8,9,11] A light non-greasy moisturiser can be applied 30-60 minutes after application to reduce irritation.[11] As with oral treatments, topical treatments act to reduce the appearance of new acne lesions rather than getting rid of existing lesions, so need to be applied to the entire affected area.[3]

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Treatments	How it works	Advantages	Disadvantages	Optimisation
Benzoyl peroxide	Oxidising agent: Bactericidal and anti-comedogenic activity.[8,11]	Lots of evidence and clinical experience in the use of benzoyl peroxide alone, or in combination, to manage acne, and useful where topical retinoids are contraindicated, such as during pregnancy or where trying to conceive.[1,3,6-9,11]	Dose-related irritation of the skin (redness, dryness, stinging and scaling) requires careful counselling and the slow increase of both strength and application frequency to prevent side-effects and related adherence issues.[1,3,6,8,9,11] Bleaches hair, clothing and linen.[1,3,11] A significant proportion of cost-effective products containing benzoyl peroxide alone have been discontinued, many new or remaining products containing benzoyl peroxide are not available in a range that allows the flexibility to increase or decrease the strength prescribed. The pricing of BPO products varies dramatically and many have ongoing and/or intermittent supply problems.	To reduce the risk of skin irritation, when treatment is initiated the frequency and potency of application should be slowly increased, starting with alternate day application, and can be increased up to twice daily application. Thereafter, treatment can be temporarily stopped and the frequency and/or potency reduced if irritation occurs.[1,3,6,8,9,11] Evidence suggests that less potent preparations are no less effective than stronger ones, so if irritation does occur and the potency of the preparation needs to be decreased or maintained at a low strength, the patient can be reassured that this will not reduce the successfulness of benzoyl peroxide treatment.[1,3] As benzoyl peroxide can bleach hair, clothing and linen, hands should be washed after use, contact avoided between clothing and treated areas for as long as possible. Do not use just before bed and avoid use of best/new towels and bedding during treatment.[1,3,11] A light non-greasy moisturiser can be applied 30-60 minutes after application to reduce irritation.[11] As with oral treatments, topical treatments act to reduce the appearance of new acne lesions rather than getting rid of existing lesions, so need to be applied to the entire affected area.[3]

Treatments	How it works	Advantages	Disadvantages	Optimisation
Azelaic acid Second line where topical retinoids and benzoyl peroxide are not tolerated, as causes less skin irritation. [6,8,9,11]	Anti-keratinising agent: antimicrobial and anti-comedogenic activity.[8,11]	Azelaic acid has similar properties and effect as benzoyl peroxide but is less irritant.[1,11]	Irritation of the skin leading to dryness and burning similar to topical retinoids and benzoyl peroxide, but less common than with either.[8,11]	As with other topical treatments, if skin irritation occurs, treatment should be stopped until this settles and then recommenced with less frequent application.[1,6,9] A light non-greasy moisturiser can be applied 30-60 minutes after application to reduce irritation.[11] As with oral treatments, topical treatments act to reduce the appearance of new acne lesions rather than getting rid of existing lesions, so need to be applied to the entire affected area.[3]
Topical antibiotics	Antibiotic	Less risk of skin irritation than other topical treatments.[6,9] Relatively quick and significant results in combination with topical retinoid.[6,8,9,11] Less risks of resistance, sensitisation and side-effects than oral antibiotics.[1,3] Topical erythromycin can be considered in pregnancy.[6,9]	Do not affect the formation of comedones.[8,11] Overall less risk of skin irritation but can cause contact dermatitis and sensitisation to antibiotic.[1,3]	Due to the risk of sensitisation, refer back to GP if side-effects occur, including significant irritation to the skin.[1,3] Adherence is essential to reduce the risk of resistance.[3,11] Concomitant use of oral and topical antibiotics from different classes must be avoided to reduce the risk of resistance.[3,6,9] To reduce the risk of resistance antibiotics should not be prescribed in mild acne until the response to non-antibiotic topical treatment has been assessed.[6,9] As with oral antibiotics, topical antibiotics act to reduce the appearance of new inflammatory lesions rather than getting rid of existing lesions, so need to applied to the entire affected area.[3]

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Treatments	How it works	Advantages	Disadvantages	Optimisation
Topical nicotinamide	Anti-inflammatory effect.[3,11]		Insufficient evidence to support its use in practice and not recommended in guidance.[3,6,9,11]	Not recommended for the management of acne.
Tetracyclines	Antibiotic	Relatively quick and significant results in combination with topical retinoid.[6,8,9,11] Improved adherence with doxycycline and lymecycline. Minocycline but should not be used) due to once daily dosing.[1,6,9]	Teratogenic: female patients need to use effective contraception (preferably two complementary forms) for the duration of treatment and one month after. Also affects the formation of developing bones and teeth so needs to be avoided during breastfeeding and in children under 12.[1,3,11] Where minocycline is being used (not recommended) the risk of hepatotoxicity and systemic lupus erythematosus necessitates regular monitoring.[1,3,6,9]	Concomitant use of oral and topical antibiotics from different classes must be avoided to reduce the risk of resistance.[3,6,9] Adherence is essential to reduce the risk of resistance.[3,11] Minocycline should not be used due to the risk of hepatotoxicity and systemic lupus erythematosus.[1,3,6,9] Doxycycline, lymecycline (and minocycline) can be taken with food but tetracycline and oxytetracycline are very sensitive to minerals in food and medicines so cannot be taken one hour before or two hours after meals, antacids, iron tablets and other mineral supplements.[3,8,11]
Erythromycin (and clarithromycin) Much more limited discussion of using oral clarithromycin in evidence but mentioned as an option in PCDS guidelines.[3,6]	Antibiotic	Relatively quick and significant results in combination with topical retinoid.[6,8,9,11] Erythromycin can be considered in pregnancy.[6,9]	High levels of resistance in *P. Acnes* to erythromycin limits effectiveness and use in practice to where tetracycline are contraindicated.[1,3,8,11] Adherence may be limited by high incidence of gastro-intestinal side-effects.[1,2,8,11]	Concomitant use of oral and topical antibiotics from different classes must be avoided to reduce the risk of resistance.[3,6,9] Adherence is essential to reduce the risk of resistance.[3,11] Take with or immediately after meals to help manage gastro-intestinal side-effects.

Signposting

Primary Care Dermatology Society
http://www.pcds.org.uk/

Patient UK
www.patient.co.uk/

The British Association of Dermatologists
http://www.bad.org.uk/

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