REVIEW

Managing acne vulgaris: an update

OPEN ACCESS

Miriam Santer,[1] Esther Burden-Teh,[2] Jane Ravenscroft[3]
[1]Primary Care Research Centre, University of Southampton, Southampton, UK
[2]University of Nottingham, Nottingham, UK
[3]Dermatology, Queen's Medical Centre, Nottingham, UK

Correspondence to Professor Miriam Santer; M.Santer@soton.ac.uk

Listen to Podcast
dtb.bmj.com

Abstract

Acne vulgaris is very common and can have significant negative impact on people. While sometimes a transient problem, acne may persist for many years and often leads to permanent scars or pigment changes. Guidelines unanimously advise topical treatments as first-line, although differ in recommending either topical benzoyl peroxide or topical retinoid (mainly adapalene) alone or in combination. Guidance published by the National Institute for Health and Care Excellence advises counselling patients regarding avoidance of skin irritation when starting topical treatments and promoting adherence (treatments take 6–8 weeks to work). Oral antibiotics are currently overprescribed for acne but have a role when coprescribed with a non-antibiotic topical treatment. Hormonal treatments, such as the combined contraceptive pill, are also effective and there is growing evidence for the use of spironolactone for women with persistent acne. Recent guidance from the Medicines and Healthcare products Regulatory Agency regarding isotretinoin has implications for specialist prescribing and monitoring, and increasing public awareness of potential risks of mental health problems and sexual dysfunction. Although acne is associated with psychiatric disorder, the mental health effects of isotretinoin remain controversial.

Key learning points

- Early effective treatment for acne may prevent scarring and pigment changes.
- Topical treatments are first line for mild/moderate acne but patients need information on how to avoid adverse effects and advice that treatments take 6–8 weeks to work.
- Oral antibiotics can be used as second-line treatment, or for moderate or severe acne, when coprescribed with a non-antibiotic topical treatment.
- Most guidelines suggest that duration of oral antibiotics for acne should be limited to 3 months, although National Institute for Health and Care Excellence suggests up to 6 months.
- Hormonal treatments, such as the combined contraceptive pill, are an alternative treatment for women but can take 3–6 months to work.
- There is a growing evidence for use of spironolactone in women with persistent acne (off-label use at present), which is also likely to take 3–6 months to work.
- Maintenance topical treatment should be continued when discontinuing oral treatments.

Introduction

Acne vulgaris (hereafter referred to as acne) is extremely common, affecting over 90% of teenagers.[1] Among people with acne, approximately 40%–60% have acne persisting into their twenties and it leads to some degree of scarring in approximately 20% of the population.[2 3] Acne can cause significant distress, decreased self-confidence and increased rates of depression and suicidal thoughts,[2] particularly among women and people identifying as non-white.[4]

As well as limiting quality of life, acne makes a major contribution to antibiotic use among young people: long courses of oral antibiotics are common and acne accounts for the majority of antibiotic exposure among people aged 11–21 years in England.[5] There is high-quality evidence supporting use of topical treatments for acne, which are recommended as first line treatment for mild-to-moderate acne.[6] However, treatment adherence is low and barriers to effective self-management include people discontinuing treatment early due to skin irritation or not seeing early treatment effects, and not differentiating between effective topical treatments and ineffective cosmetic products.[7] Healthcare professionals need to promote treatment adherence by advising about delayed onset of action and how to avoid skin irritation.[8] Providing information to patients is therefore crucial and the National Institute for Health and Care Excellence's (NICE) guideline provides a list of information that should be provided for people with acne (see table 1). This may be difficult to cover in brief consultations, highlighting the need for signposting patients towards evidence-based resources, such as those listed in box 1.

Pathogenesis of acne

Acne is primarily a condition affecting the pilosebaceous unit (hair follicles in the skin and associated oil glands), leading to inflammatory and non-inflammatory lesions and scarring, most commonly affecting the face but also the trunk.[2] The aetiology remains unclear but research into dietary, hygiene or other lifestyle causes have shown these to have little influence.[2] However, public

Table 1 Summary of information for people with acne, based on NICE guidance

All treatments—promote treatment adherence	► Positive effects can take 6 to 8 weeks to become noticeable
Topical treatments —avoiding skin irritation	► Start with alternate-day or short-contact application (eg, washing off after an hour) ► If tolerated, progress to using standard application ► Moisturisers may help reduce skin irritation and skin dryness—the moisturiser should be non oil-based and non-comedogenic
Skin care advice	► Use a non-alkaline (skin pH neutral or slightly acidic) synthetic detergent cleansing product twice daily ► Choose water based (not oil-based) and non-comedogenic preparations for skin care, make-up or sunscreen
Diet	► There is insufficient evidence to support specific diets for treating acne

NICE, National Institute for Health and Care Excellence.

perceptions around the role of diet and hygiene are linked with perceived stigma around acne.[8]

Severe acne and acne scarring have a genetic component, although the specific at-risk genes have not been identified.[2] Therefore, asking about a family history of acne scarring, acne affecting the back, and family members requiring treatment with isotretinoin is helpful.

Acne is associated with hyperandrogenism and is more common among people with polycystic ovary syndrome, as well as rarer conditions such as adrenal hyperplasia and adrenal tumours.[9]

Some medications may exacerbate acne, most importantly progesterone-only contraception, but also anabolic steroids, prednisolone, some antiepileptics and lithium.[10] Greasy topical products, such as ointments, which occlude the hair follicles, increased sweating and occlusive clothing can also trigger acne.

Clinical features and diagnosis

The diagnosis of acne is made on the clinical history and examination. There are no diagnostic criteria and the skin lesions seen are open comedones (whiteheads), closed comedones (blackheads), papules/nodules, cysts and scarring.[11] There is no strong evidence base for different treatments for different acne subtypes (comedonal vs inflammatory), and NICE and most other guidelines provide different guidance on the basis of severity rather than acne subtypes.[12] While classifications vary, the majority of acne is mild, with moderate or severe acne combined making up less than 15% of cases of acne.[3 13] See table 2 for severity classifications and linked treatment choices.

Treatment options and guidelines

International guidelines recommend either topical benzoyl peroxide or topical retinoid (mainly adapalene) as first line treatments, but with differences regarding prescribing products individually or as combination products.[12] The NICE guideline on acne, based on systematic review and network meta-analysis comparisons of acne treatments, acknowledged uncertainty in the evidence base and recommended the options in table 2 as first-line treatments.[14 15]

Box 1 Information resources for patients

- National Health Service Health A–Z: https://www.nhs.uk/conditions/acne/
- AcneSupport (British Association of Dermatologists): https://www.acnesupport.org.uk/
- Youtube video from DocMikeEvans: https://www.youtube.com/watch?v=C5Co4czoo5s

Topical treatments

First-line treatments for mild or moderate acne are fixed combination topical preparations containing retinoids, benzoyl peroxide or topical antibiotics, as outlined in table 2.[16–18] It is important that patients understand that these have a delayed onset of action (6–8 weeks) and are aware of how to avoid skin irritation when starting treatment (table 1).

Oral antibiotic treatments

The NICE guideline recommends limiting oral antibiotics to 3–6 months, while other guidelines suggest a maximum duration 3 months in order to avoid emergence of antibiotic resistance.[12 14 16–18] First-line oral antibiotic recommendations are lymecycline or doxycycline. If these are not tolerated or are contraindicated, the NICE guideline recommends that trimethoprim or an oral macrolide may be considered.[14] However, clinicians report barriers to discontinuing oral antibiotics once they have been started including patients' understandable concerns about acne relapse.[19] Monotherapy with an oral or topical antibiotic should not be used, because there is good evidence that antimicrobial resistance is significantly reduced by coprescribing benzoyl peroxide.[20] Consensus from clinical guidelines is that continuing topical treatments as maintenance therapy after discontinuing oral antibiotics is important in reducing the risk of relapse.[12]

Hormonal treatments

Hormonal treatments are an alternative for women with acne. Except for co-cyprindiol, hormonal treatments (combined oral contraceptives [COCs] or spironolactone) have an advantage over oral antibiotics and isotretinoin in that they can be continued for longer courses.

Combined oral contraceptives

COCs remain an option for women ('off-label' use in acne). Although inferior to oral antibiotics at 3 months, COCs are equivalent to antibiotics at reducing acne at 6 months.[21] There is no firm evidence to support the use of any one COC over another in terms of acne.[22]

Co-cyprindiol

Co-cyprindiol 2000/35 (cyproterone acetate 2 mg, ethinylestradiol 35 µg) is licensed as a second-line treatment for women with severe acne, but is not recommended for long-term use due to safety concerns about rare, but cumulative dose-dependent, increased risk of meningioma.[23]

Spironolactone for adult women

The results of the spironolactone for adult female acne trial, published in *The BMJ* in 2023, showed that oral spironolactone

Table 2 Summary based on NICE guidance on first-line treatments for acne

	Brand names and notes
Mild to moderate acne: 12-week course of one of the following first-line options to be applied once daily in the evening	
Fixed combination of topical adapalene with topical benzoyl peroxide (adapalene 0.1% or 0.3% with benzoyl peroxide 2.5%)	Epiduo (POM)
Fixed combination of topical clindamycin with topical tretinoin (clindamycin 1% with tretinoin 0.025%)	Treclin (POM)
Fixed combination of topical benzoyl peroxide with topical clindamycin (benzoyl peroxide 3% or 5% with clindamycin 1%)	Duac (POM)*
Topical benzoyl peroxide 5% is an alternative if other options are contraindicated or the person wishes to avoid using a topical retinoid or an antibiotic	Acnecide (P medicine)
Moderate to severe acne: 12-week course of one of the following first-line options	
Fixed combination of topical adapalene with topical benzoyl peroxide to be applied once daily in the evening	Epiduo (POM)
Fixed combination of topical clindamycin with topical tretinoin to be applied once daily in the evening	Treclin (POM)
Fixed combination of topical adapalene with topical benzoyl peroxide to be applied once daily in the evening, together with either oral lymecycline 408 mg or oral doxycycline 100 mg once daily	Epiduo (POM). Antibiotics maximum duration 3–6 months
Topical azelaic acid (15% or 20%) applied twice daily, with either oral lymecycline 408 mg or oral doxycycline 100 mg once daily	Finacea 15%, Skinoren 20% (POM). Antibiotics maximum duration 3–6 months
Combined oral contraceptives in combination with topical agents can be considered as an alternative in women	If not contraindicated
Co-cyprindiol (ethinylestradiol/cyproterone acetate) can be considered in women where other treatments have failed but require careful discussion of the risks and benefits with the patient	Careful discussion of risks and benefits. Discontinue 3 months after acne is controlled

* generic versions also available
NICE, National Institute for Health and Care Excellence; P, pharmacy only; POM, prescription only medicine.

alongside topical treatment is effective for improving outcomes for women with persistent acne, with greater effects seen at 6 months than 3 months.[24 25] Spironolactone was well-tolerated starting at a dose of 50 mg increasing to 100 mg per day, although higher doses can be associated with adverse effects, particularly menstrual irregularity.[24 26] Previous small trials suggest that the effectiveness of spironolactone may be similar to oral tetracycline for acne, but comparable data are limited.[26] Ongoing trials of spironolactone compared with oral tetracycline for acne mean that more information should be available in the next few years.[27 28]

Baseline check of renal function and potassium levels is advised prior to starting spironolactone for acne.[17] However, large observational studies show that abnormal renal function or potassium levels are very unusual in this population.[29] Ongoing monitoring is unnecessary for most young women and has recently been advocated just for women aged over 45 years.[17 29] Spironolactone is less teratogenic than oral tetracyclines commonly used for acne, so it would be appropriate for spironolactone to be treated with no special restriction beyond contraceptive counselling, as is the case for oral tetracyclines.[30]

Spironolactone is not currently licensed for the treatment of acne. However, the Medicines and Healthcare products Regulatory Agency (MHRA) advises that clinicians can use a licensed medicine outside the terms of its licence (off-label prescribing) if they are satisfied that this is in the best interest of the patient, an alternative, licensed medicine would not meet the patient's needs and there is sufficient safety and efficacy evidence.[31] In addition, the prescriber should take responsibility for prescribing the medicine and for overseeing the patient's care, including monitoring and follow-up.

Isotretinoin

The oral retinoid isotretinoin is used for treating severe acne. It was originally marketed under the brand name Roaccutane. The MHRA licensed indication for isotretinoin is for severe forms of acne (such as nodular or conglobate acne, or acne that is at risk of permanent scarring) that is resistant to adequate courses of standard therapy with systemic antibacterials and topical therapy.[23 32] The licence states that it should only be prescribed by or under the supervision of physicians with expertise in the use of systemic retinoids for the treatment of severe acne and a full understanding of the risks of isotretinoin therapy and monitoring requirements. The MHRA has defined the groups of healthcare professionals who can take the role of Lead Prescriber in making the decision to initiate isotretinoin treatment following a face-to-face assessment with the patient.[32]

Acne conglobate (severe nodular cystic acne) and acne fulminans (acne conglobate with systemic symptoms) require urgent specialist dermatology review and potentially earlier treatment with isotretinoin. Otherwise, it is first necessary to follow the stepwise management of acne recommended in the NICE guidance.

Isotretinoin is an effective treatment for severe acne.[14] There are a number of known and potential adverse effects associated with treatment.[33] Most people will experience dryness of the skin and lips, which can be helped by emollients and lip balm, and a flare in acne is common at the start of treatment.[33] Both of these adverse effects are dose dependent. Blood abnormalities are reasonably common, but in healthy people are usually not serious.[34]

Isotretinoin is highly teratogenic, and therefore, pregnancy must be avoided during treatment and for 1 month after stopping. All people with childbearing potential (people who may be able to become pregnant) must be entered into the Pregnancy Prevention Programme (PPP).

Psychiatric and sexual dysfunction adverse effects are the focus of an Expert Working Group of the Commission on Human Medicines report and have led to new MHRA guidance.[32] The effect of isotretinoin on mood remains controversial; new population based studies have not shown an increased risk of suicide, however, there are reports of individual distressing cases.[35] The MHRA has recommended better provision of information to patients regarding possible risk of mental health and sexual function adverse effects; standardised assessment of mental health prior to starting and improved monitoring for adverse effects while on treatment.[32] Patients under the age of 18 years require two health professionals to agree their acne is severe and that isotretinoin is the most appropriate treatment before initiation of isotretinoin therapy. The aim of these changes is to improve the safety of isotretinoin for the treatment of acne.

New compulsory risk minimisation materials have been developed including an Acknowledgement of Risk form for all patients (which includes the PPP for appropriate patients), a Patient Reminder Card and a Pharmacist checklist. These materials are produced and circulated by the Market Authorisation holders. Patient information and other supporting and training resources are freely available on the British Association of Dermatologists Isotretinoin Clinical Resources webpage (https://www.bad.org.uk/guidelines-and-standards/isotretinoin-clinical-resources/).

In the future, new studies are needed to further investigate these potential adverse effects, including the effect of a reduced isotretinoin dose on effectiveness and reduction of potential harms.[36]

Management of acne in skin of colour

The NICE guidance does not provide different treatment recommendations for acne in skin of colour. Postinflammatory hyperpigmentation and scarring are more frequent and a particular concern for people with skin of colour and acne, and both atrophic and keloid scarring have been reported to be more common.[37] It is important to avoid significant irritation with acne treatments, as this can worsen hyperpigmentation, but topical retinoids and azelaic acid can help both acne and hyperpigmentation.[38]

When to refer patients

Urgent (same day) referral is required for acne fulminans (acne conglobata associated with systemic symptoms).

Specialist referral is recommended by NICE for:

- Nodulocystic acne or acne conglobata (severe nodulocystic acne with interconnecting sinuses and abscesses).
- Diagnostic uncertainty.
- Mild to moderate acne that has not responded to two completed courses of treatment (see table 2).
- Moderate to severe acne which has not responded to treatment that includes an oral antibiotic.
- Acne scarring or persistent pigmentary changes.
- Acne contributing to persistent psychological distress or mental health disorder.
- Acne linked to medication use, including self-administered anabolic steroids.

Pharmacy management of acne

NHS England describes mild acne as a condition appropriate for self-management with community pharmacy advice and use of over-the-counter medicines.[39] Effective topical treatment (benzoyl peroxide) is available via community pharmacies and many offer advice about acne.[40]

Conclusion

Early effective treatment for acne improves patient well-being and may prevent permanent scars or pigment changes. Initial management includes a range of topical treatments, with the option of adding oral antibiotics for patients with more severe acne. There are significant opportunities for reducing oral antibiotic prescribing in acne. These include: promoting effective use of topical treatments; avoiding prolonged courses of oral antibiotics; coprescribing topical treatments alongside oral antibiotics; continuing topical treatments as maintenance treatment and considering alternatives, such as the combined contraceptive pill and spironolactone in primary care. When acne is unresponsive to these measures, timely referral for consideration of isotretinoin should be initiated.

Competing interests None declared. Refer to the online supplementary files to view the ICMJE form(s).

Provenance and peer review Commissioned; externally peer reviewed.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

© Author(s) (or their employer(s)) 2024. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

References

1 Hay RJ, Johns NE, Williams HC, *et al.* The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. *J Invest Dermatol* 2014;134:1527–34.
2 Williams HC, Dellavalle RP, Garner S. Acne vulgaris. *The Lancet* 2012;379:361–72.
3 Bhate K, Williams HC. Epidemiology of acne vulgaris. *Br J Dermatol* 2013;168:474–85.
4 Hassan J, Grogan S, Clark-Carter D, *et al.* The individual health burden of acne: appearance-related distress in male and female adolescents and adults with back, chest and facial acne. *J Health Psychol* 2009;14:1105–18.
5 Lown M, McKeown S, Stuart B, *et al.* Prescribing of long-term antibiotics to adolescents in primary care: a retrospective cohort study. *Br J Gen Pract* 2021;71:e887–94.
6 National Institute for Health and Care Excellence. Clinical knowledge summaries Acne Vulgaris [online] 2023. Available: https://cks.nice.org.uk/topics/acne-vulgaris/ [Accessed 24 Nov 2023].
7 Ip A, Muller I, Geraghty AWA, *et al.* Young people's perceptions of acne and acne treatments: secondary analysis of qualitative interview data. *Br J Dermatol* 2020;183:349–56.
8 Ip A, Muller I, Geraghty AWA, *et al.* Views and experiences of people with acne vulgaris and healthcare professionals about treatments: systematic review and thematic synthesis of qualitative research. *BMJ Open* 2021;11:e041794.
9 Teede HJ, Tay CT, Laven J, *et al.* Recommendations from the 2023 International evidence-based guideline for the assessment and management of polycystic ovary syndrome. *Fertil Steril* 2023;120:767–93.
10 Oakley A, Ngan V. Acne due to a medicine [online] 2014, Available: https://dermnetnz.org/topics/acne-due-to-medicine [Accessed 24 Nov 2023].
11 Griffiths CEM, Barker J, Bleiker T, *et al. Rook's textbook of Dermatology,* 9th edition. Chichester: Wiley Blackwell, 2016.
12 Corcoran L, Muller I, Layton AM, *et al.* Systematic review of clinical practice guidelines for Acne Vulgaris published between January 2017 and July 2021. *Skin Health Dis* 2023;3:e240.
13 Ghodsi SZ, Orawa H, Zouboulis CC. Prevalence, severity, and severity risk factors of Acne in high school pupils: a community-based study. *J Invest Dermatol* 2009;129:2136–41.
14 National Institute for Health and Care Excellence. Acne vulgaris: management (NG198) [online] 2021, Available: https://www.nice.org.uk/guidance/NG198 [Accessed 24 Nov 2023].

15 Mavranezouli I, Daly CH, Welton NJ, *et al.* A systematic review and network meta-analysis of topical pharmacological, oral pharmacological, physical and combined treatments for acne vulgaris. *Br J Dermatol* 2022;187:639–49.
16 Xu J, Mavranezouli I, Kuznetsov L, *et al.* Management of acne vulgaris: summary of NICE guidance. *BMJ* 2021;374:1800.
17 Zaenglein AL, Pathy AL, Schlosser BJ, *et al.* Guidelines of care for the management of acne vulgaris. *J Am Acad Dermatol* 2016;74:945–73.
18 Thiboutot DM, Dréno B, Abanmi A, *et al.* Practical management of acne for clinicians: an international consensus from the global alliance to improve outcomes in acne. *J Am Acad Dermatol* 2018;78(2 Suppl 1):S1–23.
19 Platt D, Muller I, Sufraz A, *et al.* GPs' perspectives on acne management in primary care: a qualitative interview study. *Br J Gen Pract* 2021;71:e78–84.
20 Walsh TR, Efthimiou J, Dréno B. Systematic review of antibiotic resistance in acne: an increasing topical and oral threat. *The Lancet Infectious Diseases* 2016;16:e23–33.
21 Koo EB, Petersen TD, Kimball AB. Meta-analysis comparing efficacy of antibiotics versus oral contraceptives in acne vulgaris. *J Am Acad Dermatol* 2014;71:450–9.
22 Arowojolu AO, Gallo MF, Lopez LM, *et al.* Combined oral contraceptive pills for treatment of acne. *Cochrane Database of Syst Revs* 2012;7:10.1002/14651858.CD004425.pub6.
23 Joint Formulary Committee. British National Formulary [online] 2023, Available: https://bnf.nice.org.uk/ [Accessed 24 Nov 2023].
24 Santer M, Lawrence M, Renz S, *et al.* Effectiveness of spironolactone for women with acne vulgaris (SAFA) in England and Wales: pragmatic, multicentre, phase 3, double blind, randomised controlled trial. *BMJ* 2023;381:e074349.
25 Santer M, Layton A. What do we know about prescribing spironolactone for acne. *BMJ* 2023;381:1114.
26 Layton AM, Eady EA, Whitehouse H, *et al.* Oral spironolactone for acne vulgaris in adult females: a hybrid systematic review. *Am J Clin Dermatol* 2017;18:169–91.
27 Poinas A, Lemoigne M, Le Naour S, *et al.* FASCE, the benefit of spironolactone for treating acne in women: study protocol for a randomized double-blind trial. *Trials* 2020;21.
28 Barbieri L. Spironolactone versus doxycycline for ACNE: a comparative non-inferiority evaluation (SD-ACNE) research study [online] 2023, Available: https://barbierilab.bwh.harvard.edu/clinical-trial-opportunities/ [Accessed 24 Nov 2023].
29 Thiede RM, Rastogi S, Nardone B, *et al.* Hyperkalemia in women with acne exposed to oral spironolactone: a retrospective study from the RADAR (research on adverse drug events and reports) program. *Int J Womens Dermatol* 2019;5:155–7.
30 Liszewski W, Boull C. Lack of evidence for feminization of males exposed to spironolactone in utero: a systematic review. *Journal of the American Academy of Dermatology* 2019;80:1147–8.
31 Medicines and Healthcare products regulatory agency. off-label or unlicensed use of medicines: Prescribers' responsibilities. *Drug Safety Update* 2009;2(9):6.
32 Commission on Human Medicines. Report of the Commission on Human Medicines isotretinoin implementation advisory expert working group [online] 2023, Available: https://www.gov.uk/government/publications/report-of-the-commission-on-human-medicines-isotretinoin-implementation-advisory-expert-working-group [Accessed 24 Nov 2023].
33 Vallerand IA, Lewinson RT, Farris MS, *et al.* Efficacy and adverse events of oral isotretinoin for acne: a systematic review. *Br J Dermatol* 2018;178:76–85.
34 Affleck A, Jackson D, Williams HC, *et al.* Is routine laboratory testing in healthy young patients taking isotretinoin necessary: a critically appraised topic. *Br J Dermatol* 2022;187:857–65.
35 Fazel S, Paljarvi T. "Response to 'Isotretinoin and adverse neuropsychiatric outcomes: retrospective cohort study using routine data': reply from authors". *Br J Dermatol* 2022;187:450–1.
36 Daly AU, Baptista Gonçalves R, Lau E, *et al.* A systematic review of Isotretinoin dosing in Acne Vulgaris. *JEADV Clinical Practice* 2023;2:432–49.
37 Maruthappu T, Taylor M. Acne and rosacea in skin of colour. *Clin Exp Dermatol* 2022;47:259–63.
38 Chiang C, Ward M, Gooderham M. Dermatology: how to manage Acne in skin of colour. *Drugs Context* 2022;11.
39 NHS England. Guidance on conditions for which over the counter items should not routinely be prescribed in primary care [online] 2018, Available: https://www.england.nhs.uk/medicines-2/conditions-for-which-over-the-counter-items-should-not-routinely-be-prescribed/ [Accessed 24 Nov 2023].
40 Sonnex K, Thornley T, Fleming N, *et al.* Perceived current and future roles of UK-based community pharmacy professionals in the long-term management of acne. *Explor Res Clin Soc Pharm* 2023;11:100310.

DOI: 10.1136/dtb.2023.000051