



The 'How to...?' Series

How to Manage and Review Adults and Children Over 12 Years of Age on Long-term and Repeated Antibiotics for the Prevention and Treatment of

Acne Vulgaris

First Edition

October 2022

Table of Contents

Table of Contents	2
1 Introduction	3
1.1 Aim	3
1.2 Context	3
1.3 Background	3
1.4 Booklet citation	3
2 Information for the primary care team	4
2.1 Acne	4
2.2 Aggravating and modifiable risk factors	4
3 In practice	5
3.1 Step 1: Undertake baseline search and analysis	5
3.2 Step 2: Develop implementation plan	5
3.3 Step 3: Complete patient-centred review	5
3.3.1 During the patient consultation	6
3.3.2 Treatment of acne vulgaris	7
3.3.3 Referral to specialist care	10
3.3.4 Flowchart to review long-term and repeated antibiotic use in acne	11
.....	11
3.4 Step 4: Undertake post review search and analysis	12
3.5 Step 5: Share key themes and embed quality improvement practice	12
3.5.1 Learning for staff	12
4 Future work	13
5 Appendix	14
5.1 The ‘How to...?’ series	14
5.2 UK’s five-year national action plan for antimicrobial resistance 2019-2024	14
5.3 The NHS long-term plan	15
5.3.1 Network contract Directed Enhanced Service	15
5.3.2 Conducting Structured Medication Reviews	15
5.4 Search strategy	16
5.4.1 EMIS	16
5.4.2 SystemOne	16
5.4.3 Vision	16
5.5 Providing ongoing feedback	16
6 Authors	18
7 Acknowledgements	18

1 Introduction

1.1 Aim

This booklet is part of the ‘How to...?’ series and aims to support primary care teams to review the appropriateness of antimicrobials in the evidence-based prevention and treatment of acne. Further information on the ‘How to...?’ series can be found in **Appendix 5.1**.

The booklet is not intended to duplicate or replace national guidelines; its purpose is to provide steps and resources to review patients who have received antimicrobials for the prevention or treatment of acne.

1.2 Context

The English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR) annual report 2019-2020 records a 32% increase in infections resistant to antibiotics from 2015 to 2019 (PHE, 2020). Antibiotic resistance can be accelerated by antibiotic overuse (Llor and Bjerrum, 2014), thus antimicrobial stewardship (AMS) efforts are crucial to ensure optimal antibiotic prescribing and reduce avoidable antibiotic resistance.

General practice generates over 80% of total antibiotic prescriptions in England (UKHSA, 2021). Ongoing and regular patient reviews are vital to ensure antimicrobial prescribing appropriateness and highlight the importance of AMS in line with the UK’s five-year national action plan for antimicrobial resistance (HM Gov, 2019) and the NHS long-term plan (NHS England, 2019) (see **Appendix 5.2** and **5.3**).

1.3 Background

Research has highlighted antibiotic overuse in acne as a major source of concern (Xu H and Li H, 2019; Lown M *et al.*, 2021). Patients who are treated with antibiotics not only develop antibiotic-resistant bacteria but are also likely to transfer these bacteria to other people (Sardana K *et al.*, 2015).

Conversations with patients about withdrawing acne antibiotic treatment have been deemed difficult and sensitive (Platt D, 2021). National data reveal that acne is one of the most common indications for long-term and/or repeated antibiotic use. The definition of repeat prescriptions can be categorised as long-term repeat prescriptions, whereby antibiotics are taken continuously as prophylaxis, or short-term repeat prescriptions, whereby repeated courses of antibiotics are issued acutely for the same or different indication within a specified timeframe (Krockow EM *et al.*, 2022). This booklet is designed to support primary care teams to review the appropriateness of long-term antibiotic prophylaxis (available on repeat prescription) and repeated acute antibiotic courses (defined as 3 or more courses in the past 6 months) for the prevention or treatment of acne.

1.4 Booklet citation

Shazia Patel, Eleanor J Harvey, Diane Ashiru-Oredope, 2022. How to Manage and Review Adults and Children Over 12 Years of Age on Long-term and Repeated Antibiotics for the Prevention and Treatment of Acne Vulgaris. The ‘How To...?’ Series. TARGET Toolkit [online]. Place of publication: TARGET. Available from: *URL* [accessed date]

2 Information for the primary care team

2.1 Acne

Acne vulgaris is a common and multi-factorial skin disease, affecting 85% of adolescents and young adults. Groups of patients have persistent acne lasting up to the age of 30 to 40 years, and sometimes beyond (ADAA, 2022). Complications of acne include skin changes such as scarring, post-inflammatory hyperpigmentation or depigmentation and psychosocial problems such as depression and anxiety (NICE a, 2021).

Cutibacterium acnes, formerly *Propionibacterium acnes* (Nouioui I *et al*, 2018), is the dominant component of the skin microbiome in the pilosebaceous unit. Certain strains of *C. acnes* have been linked to acne pathogenesis.

Antibiotics, mainly macrolides, clindamycin, and tetracyclines, have been the mainstay of acne treatment.

Among adolescents and young adults, exposure to long-term antibiotics (primarily lymecycline used for acne) was much greater than for acute antibiotics, increasing the risk of antimicrobial resistance. Urgent action is needed to review antibiotic use and reduce unnecessary exposure to long-term antibiotics (Lown M *et al.*, 2021).

2.2 Aggravating and modifiable risk factors

The following are aggravating and modifiable risk factors to consider:

- Hormonal factors
 - Polycystic Ovarian Syndrome (PCOS) / other endocrinological disorders (see **Section 3.3.3** referral criteria and NICE-recommended treatment options for people with PCOS [[NG198](#)]).
- Stress
 - May manifest itself as acne excoriée, where patients, usually females, habitually scratch the spots the moment they appear (PCDS, 2022).
- Diet
 - Although the evidence for a link between diet and acne is not strong, some people with acne have reported improvement in their skin when they follow a low-glycaemic index diet, which can be achieved by:
 - Increasing the consumption of whole grains, fresh fruits and vegetables, fish, olive oil, garlic.
 - Decreasing the consumption of high-glycaemic index foods such as sugar, biscuits, cakes, ice creams and bottled drinks (PCDS, 2022).
- Cosmetics, e.g., oil-based cosmetics
 - Pomade acne is caused by hair pomades, with comedonal and papulopustular acne on the forehead and temples (PCDS, 2022)
- Medicines (prescribed or self-administered)
 - Topical and oral corticosteroids
 - Anabolic steroids
 - Lithium
 - Ciclosporin
 - Iodides taken orally, which may be part of some homoeopathic therapies (PCDS, 2022).

3 In practice

Follow an audit cycle approach to improve antimicrobial prescribing and management of acne in clinical practice (see **Figure 1**).

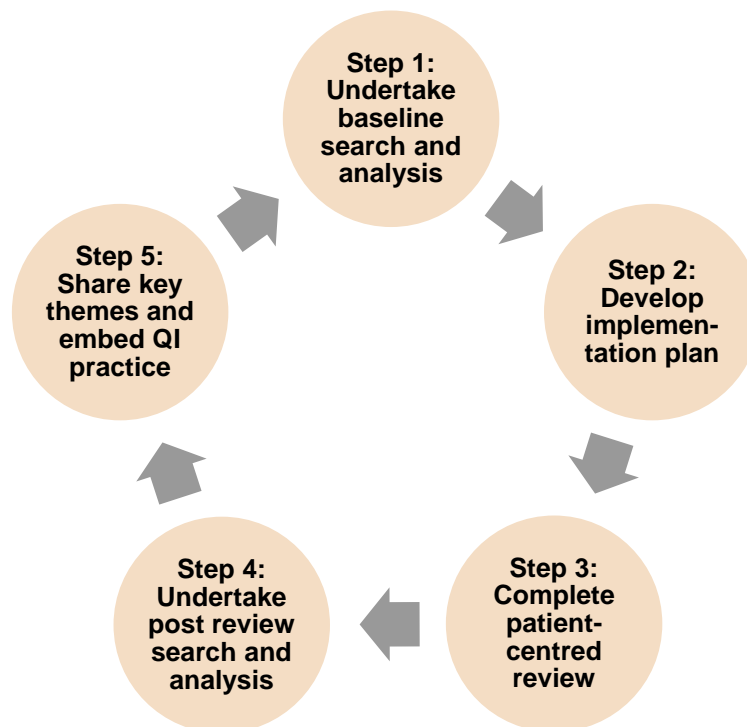


Figure 1. Improving antimicrobial prescribing in clinical practice, adapted from ‘Guide to the TARGET Resources’ (RCGP, 2021).

3.1 Step 1: Undertake baseline search and analysis

Run a search of practice records to find patients prescribed continuous long-term and/or repeated acute courses of antibiotics for acne, including topical products (see **Appendix 5.4** for a sample search strategy). Review the antibiotic prescribing and trend data for your practice. In addition, review your data in the context of benchmarking against other practices where data are available.

3.2 Step 2: Develop implementation plan

To develop an implementation plan:

- **Identify and ensure** there is a practice champion(s) who will take accountability for the relevant actions being undertaken.
- **Discuss** at a practice meeting the findings of the antibiotic prescribing and trend data analysis, the number of patients identified on long-term and repeated antibiotics, as well as any benchmarking information.
- **Plan** and assign practice staff to undertake patient-centred reviews.
- **All relevant staff to familiarise** themselves with this booklet for the management and review of adults and children over 12 years of age on long-term and repeated antibiotics for the prevention or treatment of acne vulgaris and the resources found and referenced within.

3.3 Step 3: Complete patient-centred review

For the place of the patient-centred review in the overall quality improvement cycle, refer to **Section 3.3.4** ‘Flowchart to review long-term and repeated antibiotic use in acne’.

3.3.1 During the patient consultation

During the patient consultation undertake the following:

- **Establish** a clear history of the patient's condition, current use of medication and baseline habits alongside lifestyle modifications and treatments tried to-date.
 - Investigate if any medication may have exacerbated acne (see section 2.2)
- **Explore** any impact their condition has on their self-esteem and mental health.
To note: This may need special consideration and appropriate referral (see **Section 3.3.3**).
- **Listen** to the patient's concerns and priorities and establish their expectations for management of their condition.
- **Encourage** self-care measures and recording of symptoms, e.g., encourage patient to:
 - Take baseline and regular photos of acne to track treatment success or failure.
 - Write journal of symptoms and record photos to track the treatment success or failure.
- **Manage** patient expectations regarding the natural history of acne use of antibiotics and discuss the rationale behind using/not using antibiotic treatment through shared decision making. Discuss the importance of completing the course of treatment, because positive effects can take 6 to 8 weeks to become noticeable. [NG198, 1.5.5]
- **Signpost** to digital apps if appropriate. For example:
 - [Dermatology digital playbook - Digital playbooks - NHS Transformation Directorate \(nhsx.nhs.uk\)](https://www.nhs.uk/healthcare/digital-playbooks): This is a patient-facing app for skin self-monitoring and image-sharing with clinicians. The app can be downloaded by the patient to take and submit photographs to aid progress reporting and follow-up and monitor treatment success.
- **Be aware** of any special considerations, e.g.:
 - Darker skin tones:
 - Acne is no more common or severe in pigmented skin.
 - Post-inflammatory hyperpigmentation can be more marked, therefore, treat patients with darker skin tones early and more aggressively, including earlier consideration of referral to secondary care or a dermatology service (PCDS, 2022).
 - Women of childbearing potential:
 - 'Topical retinoids and oral tetracyclines are contraindicated during pregnancy and when planning a pregnancy', women must use effective contraception or choose alternative treatment to these options (NICE b, 2021).
 - 'If a person receiving treatment for acne wishes to use hormonal contraception, consider using the combined oral contraceptive pill in preference to the progestogen-only pill' (NICE b, 2021).

3.3.1.1 Self-care measures

Skin care advice:

- Avoid over cleaning the skin as this may cause dryness and irritation.
- Use a non-alkaline (skin pH neutral or slightly acidic) cleansing product twice daily on acne-prone skin.
- For those who use skin care products (for example, moisturisers) and sunscreens, avoid oil-based and comedogenic preparations. This could be discussed with the community pharmacist.
- For those who use make-up, remove make-up at the end of the day.
- For those who persistently scratch or pick at acne lesions, counsel that this habit can increase the risk of skin scarring.

- (NICE b, 2021; PCDS, 2022)

Dietary advice:

- There is some evidence for improved acne with a low-glycaemic diet (PCDS, 2022).
- However, promotion of this diet is not recommended as many of the patients are adolescents, where reduced confidence and body image may already exist, and the onset of eating disorders is common.
- Therefore, limiting particular foods is discouraged (NICE b, 2021).
- Healthy eating advice is recommended (PHE, 2016).

To note: Ensure to provide safety netting advice, e.g., persistent pigmentary changes to skin to seek medical assistance.

Further resources:

- Self-care advice and patient information - [NHS Choices](#)
- Acne patient information leaflets: [patient.info](#)
- Acne patient information leaflet: [British Association of Dermatologists](#)
- Patient experience with acne: [Patient stories](#)
- For professionals or patients: [Acne photos, aetiology and treatments](#)
- Healthy eating advice: [The Eating Well Guide](#)

3.3.2 Treatment of acne vulgaris

3.3.2.1 First-line treatment options

Confirm whether one of the following first-line treatment options has been tried as part of a 12-week course (NICE b, 2021):

- Combination of topical adapalene with topical benzoyl peroxide (any severity)
- Combination of topical tretinoin with topical clindamycin (any severity)
- Combination of topical benzoyl peroxide with topical clindamycin (mild to moderate)
- Combination of topical adapalene with topical benzoyl peroxide with either oral lymecycline or oral doxycycline (moderate to severe)
- Topical azelaic acid with either oral lymecycline or oral doxycycline (moderate to severe)

If above treatments are contraindicated or the patient wants to avoid a topical retinoid or topical/oral antibiotic, consider topical benzoyl peroxide monotherapy.

If oral lymecycline or oral doxycycline are contraindicated, consider replacing in the combination treatments with oral trimethoprim or an oral macrolide (e.g., erythromycin) (NICE b, 2021).

To reduce the risk of skin irritation associated with topical treatments, such as benzoyl peroxide or retinoids, start with alternate-day or short-contact application (for example washing off after an hour). If tolerated, progress to using a standard application.

To aid shared decision-making, refer to **Table 1** taken from [\[NG198\]](#).

Table 1. Treatment choices for mild to moderate and moderate to severe acne vulgaris.

Acne severity	Treatment	Advantages	Disadvantages
Any severity	Fixed combination of topical adapalene with topical benzoyl peroxide, applied once daily in the evening	<ul style="list-style-type: none"> - Topical - Does not contain antibiotics 	<ul style="list-style-type: none"> - Not for use during pregnancy - Use with caution during breastfeeding - Can cause skin irritation, photosensitivity and bleaching of hair and fabrics
Any severity	Fixed combination of topical tretinoin with topical clindamycin, applied once daily in the evening	<ul style="list-style-type: none"> - Topical 	<ul style="list-style-type: none"> - Not for use during pregnancy or breastfeeding - Can cause skin irritation and photosensitivity
Mild to moderate	Fixed combination of topical benzoyl peroxide with topical clindamycin, applied once daily in the evening	<ul style="list-style-type: none"> - Topical - Can be used with caution during pregnancy and breastfeeding. 	<ul style="list-style-type: none"> - Can cause skin irritation, photosensitivity and bleaching of hair and fabrics
Moderate to severe	Fixed combination of topical adapalene with topical benzoyl peroxide, applied once daily in the evening, plus either oral lymecycline or oral doxycycline taken once daily	<ul style="list-style-type: none"> - Oral component may be effective in treating affected areas that are difficult to reach with topical treatment (such as the back) - Treatment with adequate courses of standard therapy with systemic antibiotics and topical therapy is a Medicines and Healthcare products Regulatory Agency (MHRA) requirement for subsequent oral isotretinoin 	<ul style="list-style-type: none"> - Not for use in pregnancy, during breastfeeding, or under the age of 12 - Topical adapalene and topical benzoyl peroxide can cause skin irritation, photosensitivity, and bleaching of hair and fabrics - Oral antibiotics may cause systemic side effects and antimicrobial resistance - Oral tetracyclines can cause photosensitivity
Moderate to severe	Topical azelaic acid applied twice daily, plus either oral lymecycline or oral doxycycline taken once daily	<ul style="list-style-type: none"> - Oral component may be effective in treating affected areas that are difficult to reach with topical treatment (such as the back) - Treatment with adequate courses of standard therapy with systemic antibiotics and topical therapy is an MHRA requirement for subsequent oral isotretinoin 	<ul style="list-style-type: none"> - Not for use in pregnancy, during breastfeeding, or under the age of 12 - Oral antibiotics may cause systemic side effects and resistance - Oral tetracyclines can cause photosensitivity

3.3.2.2 Antibiotics

Do not use the following to treat acne:

- Monotherapy with a topical antibiotic.
- Monotherapy with an oral antibiotic.
- Combination of topical antibiotic and oral antibiotic.

To note: Evidence shows that ‘combinations of topical treatments that included benzoyl peroxide, clindamycin and/or a retinoid (adapalene) were overall more effective than any of these interventions used as topical monotherapies, and this was the case for any severity of acne.’ The evidence also showed that a combination of 3 topical agents was less or similarly effective compared with a combination of any 2 agents’, so triple therapy is not recommended (NICE b, 2021).

Review efficacy of antibiotic treatment after 12 weeks. This is an adequate length of treatment to identify non-response:

- If their acne has completely cleared, consider stopping the antibiotic but continuing the topical non-antibiotic treatment until the next review.
- If their acne has improved but not completely cleared, consider continuing the oral antibiotic, alongside the topical treatment, for up to 12 more weeks.

Good practice points:

- Do not use an oral antibiotic monotherapy; combine oral antibiotic with a topical non-antibiotic treatment to treat acne.
- Aim to limit the duration of systemic antimicrobial treatment to 3 months, followed by maintenance therapy with topical retinoid and/or antiseptic for 12 weeks (then review whether to continue) (NICE b, 2021).
- If acne responds adequately to a course of an appropriate first-line treatment but then relapses, consider either: another 12-week course of the same treatment or an alternative 12-week treatment (NICE b, 2021).
- For unresponsive moderate to severe acne, consider an option that includes an oral antibiotic. If the current option included an oral antibiotic, then referral to a consultant dermatologist-led team can be considered.
- If acne recurs on cessation of antimicrobial therapy despite topical treatment, consider a systemic retinoid (via dermatology referral to secondary care) if rapid relapse, or intermittent 3-month courses of systemic antimicrobial if a longer remission was achieved.
- Treatments including topical or oral antibiotics should only last longer than 6 months in exceptional circumstances, with review at 3-monthly intervals: the aim being to discontinue the antibiotic as soon as possible.

For further advice and guidance on the management of acne refer to NICE guidance (NICE b, 2021).

3.3.3 Referral to specialist care

Referral to dermatology:

Urgent referral

- People with acne fulminans, refer on the same day to the on-call hospital dermatology team.

Referral

- There is diagnostic uncertainty about patient's acne.
- Acne conglobata: serious form of nodulo-cystic acne with scars and abscesses over/under the surface of the skin.

Considerations for referral

- Mild to moderate acne that has not responded to two completed 12-week courses of treatment.
- Moderate to severe acne which has not responded to previous treatment (dual therapy including oral antibiotic).
- Acne with scarring.
- Acne with persistent pigmentary changes.
- Acne of any severity, or acne-related scarring, that is causing or contributing to persistent psychological distress or a mental health disorder.
- Any patient for whom oral retinoid therapy (isotretinoin) is being considered (NICE b, 2021).

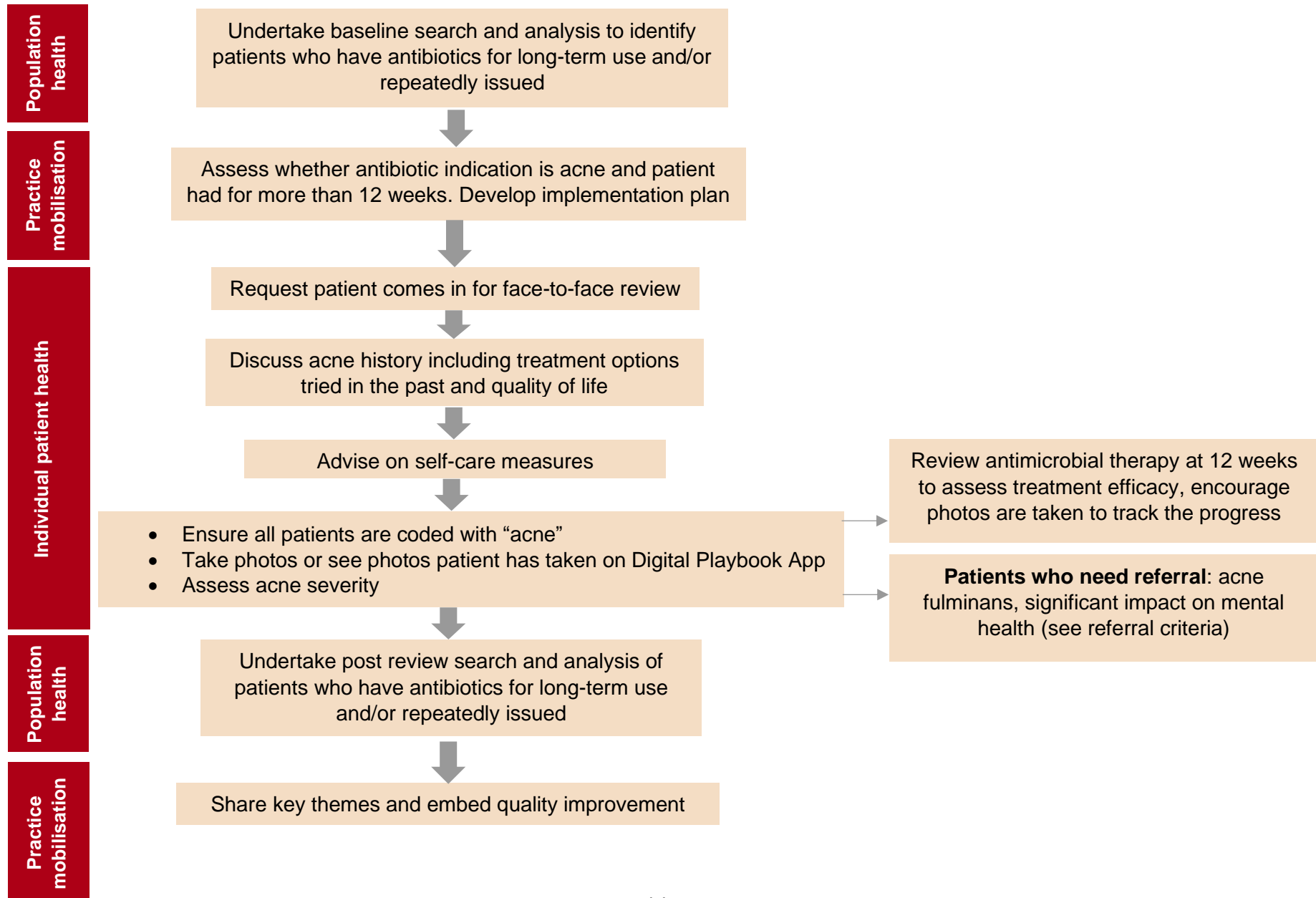
Referral to mental health services:

- Patient with acne experiences significant psychological distress or a mental health disorder, including those with a suspected current or past history of:
 - Suicidal ideation or self-harm.
 - Severe depressive or anxiety disorder.
 - Body dysmorphic disorder.

Other:

Consider condition-specific management or referral to a specialist (for example a reproductive endocrinologist) if a medical disorder or medication (including self-administered anabolic steroids) is likely to be contributing to a person's acne.

3.3.4 Flowchart to review long-term and repeated antibiotic use in acne



3.4 Step 4: Undertake post review search and analysis

Analyse general practice data for long term and/or repeated antimicrobial prescribing for acne prevention and treatment (see **Appendix 5.4** for a sample 'Search strategy') and benchmarking against baseline.

To note: Suggest undertaking 3-6 months after Step 1 baseline search and analysis.

3.5 Step 5: Share key themes and embed quality improvement practice

Share key themes identified from both baseline and post review searches with the primary care team and embed quality improvement through staff learning.

3.5.1 Learning for staff

To support staff learning:

- Make sure all patients are coded with 'acne'.
- Review practice data on ePACT (or otherwise available reports) for long-term and repeated antimicrobial prescribing for acne.
- Discuss outcomes and learnings for practice.
- Introduce a proactive strategy to identify potential health inequalities amongst patient populations in accessing treatment, coming forward for diagnosis, following self-care measures, and the differential outcomes of different topical treatments on ethnic skin types.
- Best practice points to discuss:
 - Provide self-care advice and follow a stepwise approach to treatment options.
 - Manage patient expectations for an antimicrobial treatment.

Further resources:

- eLearning for antimicrobial prescribing
[Health Education England](#): Antimicrobial Resistance and Infections

4 Future work

This 'How to...?' booklet is in its first edition. The authors recognise future work may be required to further optimise the booklets. Future work to include:

- A checklist document (less than 2 pages in length) for primary care teams to work through with patients during a consultation
 - To act as an aide memoire of steps that should be considered to avoid or reduce the risk of infection and alternatives to antibiotics before prescribing rescue packs or continuing long-term antibiotic prophylaxis.
- A pilot of booklet use by primary care teams across the UK
 - To ensure booklet relevance and usefulness for the review of patients on long-term and repeated antibiotics.
- Ongoing multi-disciplinary consultation, particularly with respiratory specialist nurses and physiotherapists, consultant respiratory physicians and GPs with a special interest in COPD.
 - To incorporate specialist knowledge and widen practice perspective.

Information collated via the feedback form (see link in **Appendix 5.5**) will be used to inform revisions and update future editions.

5 Appendix

5.1 The 'How to...?' series

The 'How to...?' series focuses on supporting healthcare professionals in primary care teams on how to review patients on long-term and repeated antimicrobials as part of AMS initiatives. The series supports the ambitions of the UK's five-year national action plan for antimicrobial resistance 2019-2024, as outlined in **Appendix 5.2**.

Booklet development involved:

- 1) Identification of gaps in primary care AMS interventions to inform a novel AMS intervention focused on long-term/repeated antimicrobials
- 2) Retrieval and analysis of primary care data to determine common indications that have high use of long-term/repeated antimicrobials
 - Local source data from Primary Care Networks
 - National source data from OpenSAFELY
- 3) Completion of booklet draft per identified common indication
- 4) Involvement of stakeholders in booklet feedback via questionnaire and email correspondence
- 5) Completion of final booklet draft based on received feedback
- 6) Governance submission of booklets to:
 - English Surveillance Programme for Antimicrobial Utilisation and Resistance Oversight Group
 - NHS England
 - Royal College of General Practitioners
 - UK Health Security Agency

Each booklet within the series can be used for individual patient consultations, as well as wider initiatives such as:

- Practice prescribing audits
- Quality improvement projects
- Local projects to tackle antimicrobial resistance
- Community pharmacy projects

The booklets in the 'How to...?' series are not intended to replace national guidance, but to be used alongside guidance and other resources highlighted within individual booklets.

5.2 UK's five-year national action plan for antimicrobial resistance 2019-2024

Part of the UK's five-year national action plan for antimicrobial resistance 2019 to 2024 states:

'To strengthen stewardship programmes, the UK will:

- **Develop** a patient-level prescribing and resistance data source (including health and infection outcome and impact data) with timely access at point of care to support clinical decision making along with access to NICE guidance.
- **Enhance** the role of pharmacists in primary care to review the dose and duration of antimicrobial prescriptions (especially long-term or repeat ones) and work with prescribers to review those that are inappropriate through evidence-based, system-wide interventions.
- **Raise public awareness** to encourage self-care and reduce expectations of antibiotics.'

5.3 The NHS long-term plan

Primary Care Networks (PCNs) are ‘an essential building block of every Integrated Care System, and under the network contract Directed Enhanced Service, general practice takes the leading role in every Primary Care Network’ (NHS England, 2019).

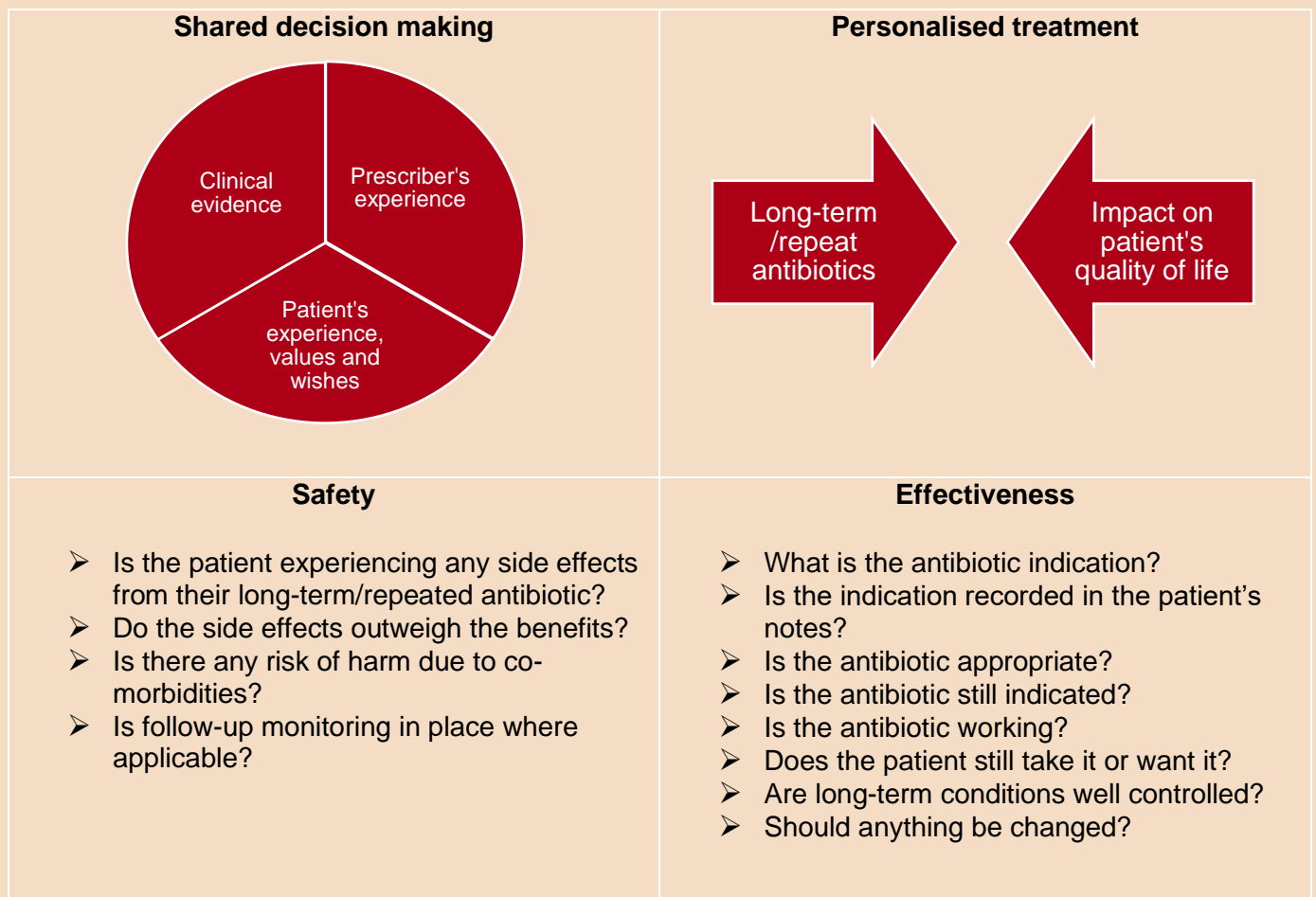
5.3.1 Network contract Directed Enhanced Service

The network contract Directed Enhanced Service (DES) outlines clinical responsibilities of pharmacy teams. Clinical pharmacists can ‘provide leadership on person-centred medicines optimisation (including ensuring prescribers in the practice conserve antibiotics in line with local antimicrobial stewardship guidance) and quality improvement’ and ‘actively work with its CCG in order to optimise the quality of local prescribing of antimicrobial medicines’. Pharmacy technicians can ‘support initiatives for antimicrobial stewardship to reduce inappropriate antibiotic prescribing’ (NHSEI a, 2020).

5.3.2 Conducting Structured Medication Reviews

Within the DES, a Structured Medication Review (SMR) and Medicines Optimisation service offers a framework for booklet implementation. A SMR encourages shared decision making and personalised treatment, considering safety and effectiveness of interventions (NHSEI b, 2020). See **Figure 2** for a summary for conducting SMRs proposed by booklet authors.

Figure 2. Proposed summary for conducting a Structured Medication Review for long-term and repeated antibiotics, adapted from ‘Network Contract DES – SMR reviews and medicines optimisation: guidance (NHSEI b, 2020)’.



5.4 Search strategy

You can access the search strategy documents outlined below by linking to this folder:

<https://app.box.com/s/xr294wnd7lf7izsmjr2gdqk6fn1mhzpa>

If you have difficulties accessing this folder, email: TARGETAntibiotics@ukhsa.gov.uk

5.4.1 EMIS



Guide for the using
the NHSEI antibiotic w



Emis antibiotic
searches.xml

Save this .xml file to your desktop and then follow the guide.

5.4.2 SystemOne



Guide for the using
the NHSEI antibiotic w



SystemOne antibiotic
searches.rpt

Save this .rpt file to your desktop and then follow the guide.

5.4.3 Vision



Quick Guide to
VISION AD HOC Search

5.5 Providing ongoing feedback

For continual monitoring and update of the information included within this booklet, please provide feedback via this [link](#) or the QR code below.



6 Authors

Shazia Patel – Chief Pharmaceutical Officer’s Clinical Fellow 21/22 at Care Quality Commission

Eleanor J Harvey – Chief Pharmaceutical Officer’s Clinical Fellow 21/22 at UK Health Security Agency

Project Lead:

Prof Diane Ashiru-Oredope – Chair, English Surveillance Programme for Antimicrobial Utilisation and Resistance and UKHSA’s Lead Pharmacist for HCAI, AMR, AMU, Fungal and Sepsis Division

Reviewed by:

English Surveillance Programme for Antimicrobial Utilisation and Resistance Oversight Group

Dr Dharini Shanmugabavan – Medical Director of Clinical Quality, Royal College of General Practitioners

Dr Donna Lecky – Unit Lead, Primary Care and Interventions Unit, UK Health Security Agency

Dr Kieran Hand – National Pharmacy and Prescribing Clinical Lead, NHS England

Dr Russell Hope – Division Lead, Healthcare and Associated Infections, Antimicrobial Resistance, Antimicrobial Use, Fungal and Sepsis Division, UK Health Security Agency

7 Acknowledgements

We would like to thank all multidisciplinary colleagues who participated in the production of this booklet.

Collaborators in developing this booklet:

Name	Role	Affiliation	Area
Avril Tucker	Pharmacist	Cwm Taf Morgannwg (CTM) University Health Board, NICE Managing Common Infections Committee, All Wales Prescribing Advisory Group	Wales
Dr Alex Orlek	Scientist (Epidemiology)	UK Health Security Agency	National
Brian McKenna	Honorary Research Fellow Pharmacist	Bennett Institute for Applied Data Science, University of Oxford, UK	National
Dr Conor Jamieson	Regional Antimicrobial Stewardship Lead	NHS England	Midlands
David Ladenheim	Lead Pharmaceutical Advisor	Herts and West Essex ICS	East of England
Dr Donna Lecky	Primary Care Interventions Unit Lead	UK Health Security Agency	National
Fran Husson	Public Partner	UK Health Security Agency	National
Helen Kilminster	Senior Pharmacist	Black Country & West Birmingham PCN, Primary Care Pharmacy Association	Midlands
Jean Langham	Prescribing Support Technician	Northamptonshire Integrated Care Board	Midlands

Kathryn Morley	Prescribing Support Technician	Northamptonshire Integrated Care Board	Midlands
Dr Kieran Hand	National Pharmacy and Prescribing Clinical Lead	NHS England	National
Louis Fisher	Epidemiologist/ Health Data Scientist	Bennett Institute for Applied Data Science, University of Oxford, UK	National
Dr Naomi Fleming	Regional Antimicrobial Stewardship Lead	NHS England	East of England

Contributors providing feedback on this booklet:

Name	Role	Affiliation	Area
Dr Amanda Morrison	General Practitioner	Mildway Medical Practice, Central 1 Islington PCN	London
Avril Tucker	Pharmacist	Cwm Taf Morgannwg (CTM) University Health Board, NICE Managing Common Infections Committee, All Wales Prescribing Advisory Group	Wales
Bisola Sonoiki	Pharmacist	Kingswood Surgery, Brunel Health Group PCN	South West
Caroline Hooper	Pharmacist	Murton Medical Group, North Easington PCN	North East and Yorkshire
David Ashton	Pharmacist	Parkwood PCN	Midlands
Dr Devina Maru	General Practitioner Registrar	National Medical Director's Clinical Fellow 21/22 at Care Quality Commission	National
Dr Elizabeth Roberts	Consultant Dermatologist	University Hospitals of Leicester NHS Trust	Midlands
Dr Funke Aguda	General Practitioner	Orsett Surgery, Stanford le Hope PCN	East of England
Gareth Malson	Pharmacist	Boughton Medical Group, Chester East PCN	North West
Jacqui Hodgson	Nurse	St Away Andrews Medical Practice, Barnet 2 PCN	London
Karen O'Brien	Regional Chief Pharmacist and Controlled Drugs Accountable Officer	NHS England	North West
Meryl Davies	Lead Antimicrobial Pharmacist – Primary & Community Care	Public Health Wales	Wales
Muhammad Siddiqur Rahman	Pharmacist	Court View Surgery, Strood PCN	South East
Natalie Neal	Pharmacist	Shotfield Medical Practice, Wallington PCN	London
Dr Olatayo Ariba	General Practitioner	Windrush Medical Practice, Eynsham and Witney PCN	South East

8 References

- AADA, 2022. Acne clinical guideline. American Academy of Dermatology Association. Available from: <https://www.aad.org/member/clinical-quality/guidelines/acne> accessed 20/06/2022.
- HM Gov, 2019. Tackling antimicrobial resistance 2019-2024. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784894/UK_AMR_5_year_national_action_plan.pdf accessed 07/03/22.
- Krockow EM et al., 2022. Addressing long-term and repeat antibiotic prescriptions in primary care: considerations for a behavioural approach. *BMJ Quality & Safety* Published Online First: 15 June 2022. <http://dx.doi.org/10.1136/bmjqs-2022-014821>
- Llor C and Bjerrum L, 2014. Antimicrobial resistance: risk associated with antibiotic overuse and initiatives to reduce the problem. *Ther Adv Drug Saf*, 2014, 5(6):229-241.
- Lown M et al, 2021. Prescribing of long-term antibiotics to adolescents in primary care: a retrospective cohort study. *Br J Gen Pract*, 2021;71(713):e887-e894.
- NHSEI a, 2020. Network Contract Directed Enhanced Service: Contract Specification 2020/21 – PCN Requirements and Entitlements. 2020. NHS England and NHS Improvement.
- NHSEI b, 2020. Network Contract Directed Enhanced Service: Structured medication reviews and medicines optimisation: guidance. 2020. NHS England and NHS Improvement.
- NICE a, 2021. CKS Acne vulgaris. National Institute for Health and Care Excellence. Available from: <https://cks.nice.org.uk/topics/acne-vulgaris/> accessed 20/06/2022.
- NICE b, 2021. NG198 Acne vulgaris: management. National Institute for Health and Care Excellence. Available from: <https://www.nice.org.uk/guidance/ng198> accessed 20/06/2022.
- Nouioui I et al, 2018. Genome-Based Taxonomic Classification of the Phylum *Actinobacteria*. *Front Microbiol*, 2018;9:2007.
- PCDS, 2022. Acne: acne vulgaris. The Primary Care Dermatology Society. Available from: <https://www.pcds.org.uk/clinical-guidance/acne-vulgaris> accessed 20/06/2022.
- PHE, 2016. The Eatwell Guide. Public Health England (UK Health Security Agency from October 2021). Available from: <https://www.gov.uk/government/publications/the-eatwell-guide> accessed 20/06/2022.
- PHE, 2020. ESPAUR Report 2019 to 2020. Available from: <https://webarchive.nationalarchives.gov.uk/ukgwa/20211022024510/https://www.gov.uk/government/publications/english-surveillance-programme-antimicrobial-utilisation-and-resistance-espaur-report> accessed 06/10/2022.
- Platt D et al, 2021. British GPs' perspectives on acne management in primary care: a qualitative interview study. *British Journal of General Practice*, 2021;71(702):e78-e84.
- Sardana K et al, 2015. Antibiotic resistance to *Propionobacterium acnes*: worldwide scenario, diagnosis and management. *Expert Rev Anti Infect Ther*, 2015;13:883-896.
- UKHSA, 2021. ESPAUR Report 2020 to 2021. Available from: <https://www.gov.uk/government/publications/english-surveillance-programme-antimicrobial-utilisation-and-resistance-espaur-report> accessed 05/10/2022.
- Xu H and Li H, 2019. Acne, the Skin Microbiome, and Antibiotic Treatment. *American Journal Clinical Dermatology*, 2019;20(3):335-344.