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THE HEART OF MEDICAL EDUCATION

IMPROVING ACNE VULGARIS WITH MULTIMODAL TREATMENT STRATEGIES

MICRO LEARNING

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DEVELOPED BY DERMATOLOGY CONNECT

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THIS PROGRAMME HAS BEEN DEVELOPED BY A GROUP OF EXPERTS

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EDUCATIONAL OUTCOMES

- Describe the four primary **pathogenic factors** resulting in the **development of acne vulgaris**
- Name **the treatment options** for acne vulgaris and how each **targets** the associated pathogenic factors
- Differentiate the **appropriate placement of therapies** in acne vulgaris in accordance with the **guidelines** across the patient journey and disease severities
- Explain the need to adopt a **multimodal treatment approach** for acne vulgaris

KEY CLINICAL TAKEAWAYS AND RECOMMENDATIONS

- **Acne vulgaris is driven by four key pathogenic factors:** Excess sebum production and constituents, inflammation, follicular hyperkeratinisation, and microbial changes
- **Treatment options and guidelines:** Latest guidelines provide excellent evidence-based treatments options available to optimise acne outcomes aligned to patient needs and expectations
- **Appropriate placement of therapies:** Depends on disease severity, duration, disease burden, history, prior therapies and response
- **Use multimodal treatment strategies:** Combining treatments targeting different pathogenic factors is essential to achieve the best efficacy

Recommendations

- Assess and tailor treatment – Carefully evaluate lesion type, site and extent and factors influencing severity, and personalise treatment based on history, clinical presentation, patient needs and expectations
- Take acne vulgaris seriously – Acne is not a trivial disease. The burden is not always linked to objective visual severity; individual patient experiences and psychosocial impact should also guide management

INTRODUCTION

PREVALENCE AND PATHOPHYSIOLOGY OF ACNE VULGARIS

BEFORE YOU PROCEED: REFLECT BRIEFLY

IS ACNE VULGARIS ONE OF THE TOP 10 DISEASES?

THE RELEVANCE AND PREVALENCE OF ACNE VULGARIS

ACNE IS IN THE TOP 10 OF THE MOST PREVALENT DISEASES WORLDWIDE[1,2]

According to the Global Burden of Skin Disease Study

- Acne affects 85% of young adults aged 12-25 years[3]
- Worldwide acne prevalence is 9%[1]
- 650 million people around the world are affected[1]

An example of acne vulgaris[a]

[a] Image kindly provided by Prof. Ochsendorf

1. Dreno B, et al. J Cosmet Dermatol. 2020;19:2201-11; 2. Hay RJ, et al. J Invest Dermatol. 2014;134(6):1527-34; 3. Lynn D, et al. Adol Health Med Ther. 2016:713-25

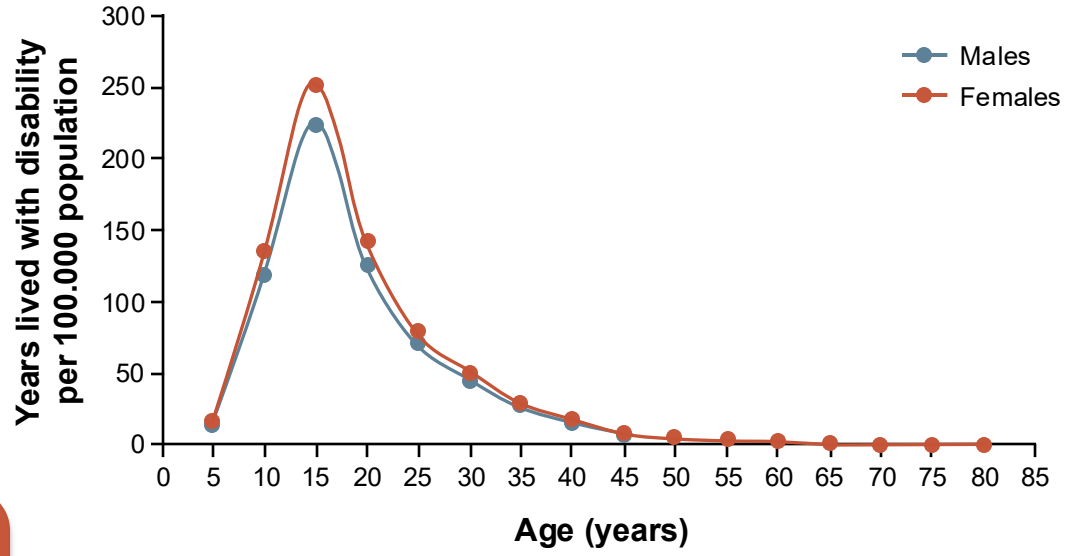
ACNE NATURAL HISTORY

A CHRONIC DISEASE, MOST COMMON IN ADOLESCENT AGE GROUP

- Acne can persist into, or develop during, adulthood. It affects:[1,a]
  - 64% of 20–29-year-olds
  - 43% of 30–39-year-olds
  - 3–5% of 40-49-year-olds have acne
- Mild acne may persist for a couple of years
- Severe acne can last for many years

Burden of acne[2]

Acne vulgaris, 2010



Once regarded as a transient disease of teenagers, acne is now presenting **earlier** and **lasting longer**

[a] According to a survey of the German population

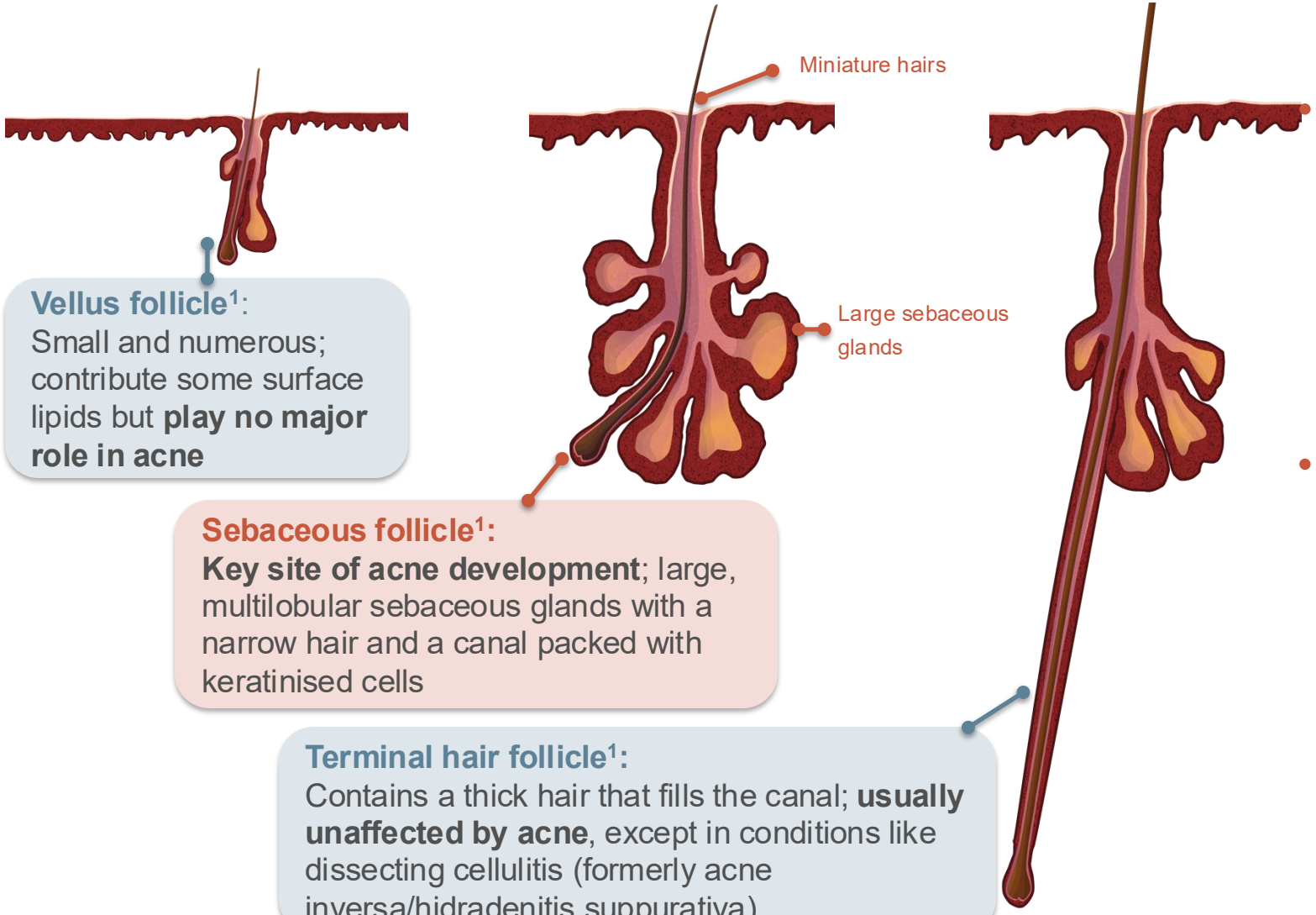
1. Scott-Emuakpor R, et al. Cureus. 2023;15:e38019; 2. Lynn DD, et al. Adolesc Health Med Ther. 2016;7:13-25

BEFORE YOU PROCEED: REFLECT BRIEFLY

HOW FAMILIAR ARE YOU WITH THE KEY PATHOGENIC FACTORS IN THE DEVELOPMENT OF ACNE VULGARIS?

ACNE IS CENTRED AROUND THE PILOSEBACEOUS UNIT

ACNE IS PRIMARILY AN INFLAMMATORY SKIN DISEASE



Vellus follicle[1]:
Small and numerous; contribute some surface lipids but **play no major role in acne**

Sebaceous follicle[1]:
Key site of acne development; large, multilobular sebaceous glands with a narrow hair and a canal packed with keratinised cells

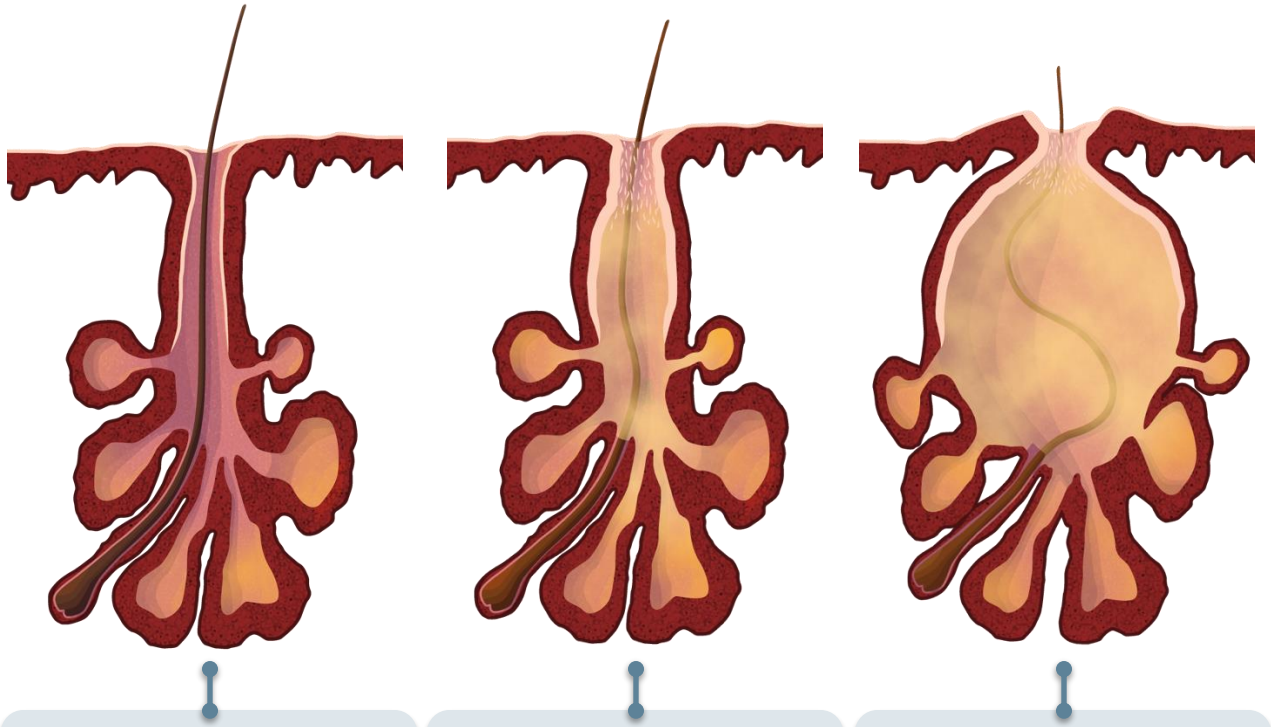
Terminal hair follicle[1]:
Contains a thick hair that fills the canal; **usually unaffected by acne**, except in conditions like dissecting cellulitis (formerly acne inversa/hidradenitis suppurativa)

- Chronic **inflammatory disease** of **sebaceous follicles** affects:[2]
  - the face (99% of cases; highest density of sebaceous follicles)
  - back (60% of cases)
  - chest (15% of cases)
- Clinically very **heterogeneous** presentation[2]
  - different lesions, frequent seborrhoea

1. Plewig, G., Melnik, B. and Chen, W.C. (2019) Plewig and Kligman's Acne and Rosacea. 4th Edition, Springer, Berlin (chapter 1);
2. EDF. S3-Guideline for the Treatment of Acne (Update 2016). Available here (accessed May 2025)

COMEDOGENESIS

THE LIFE HISTORY OF THE COMEDO

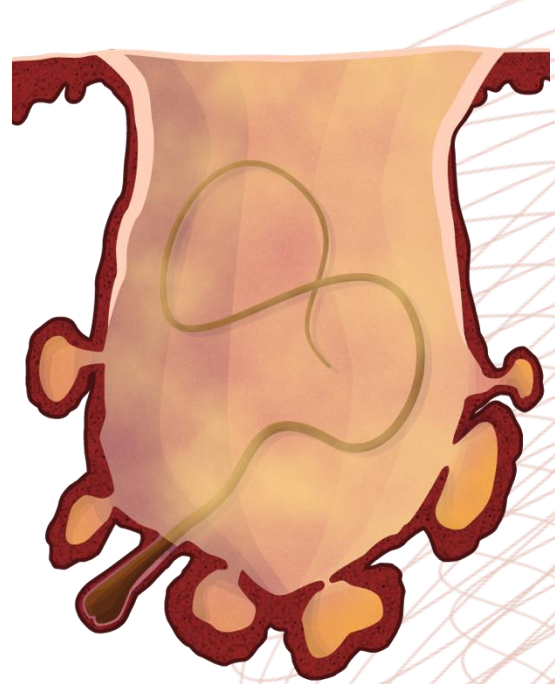


Normal sebaceous follicle

Early microcomedo

Late microcomedo

Closed comedone

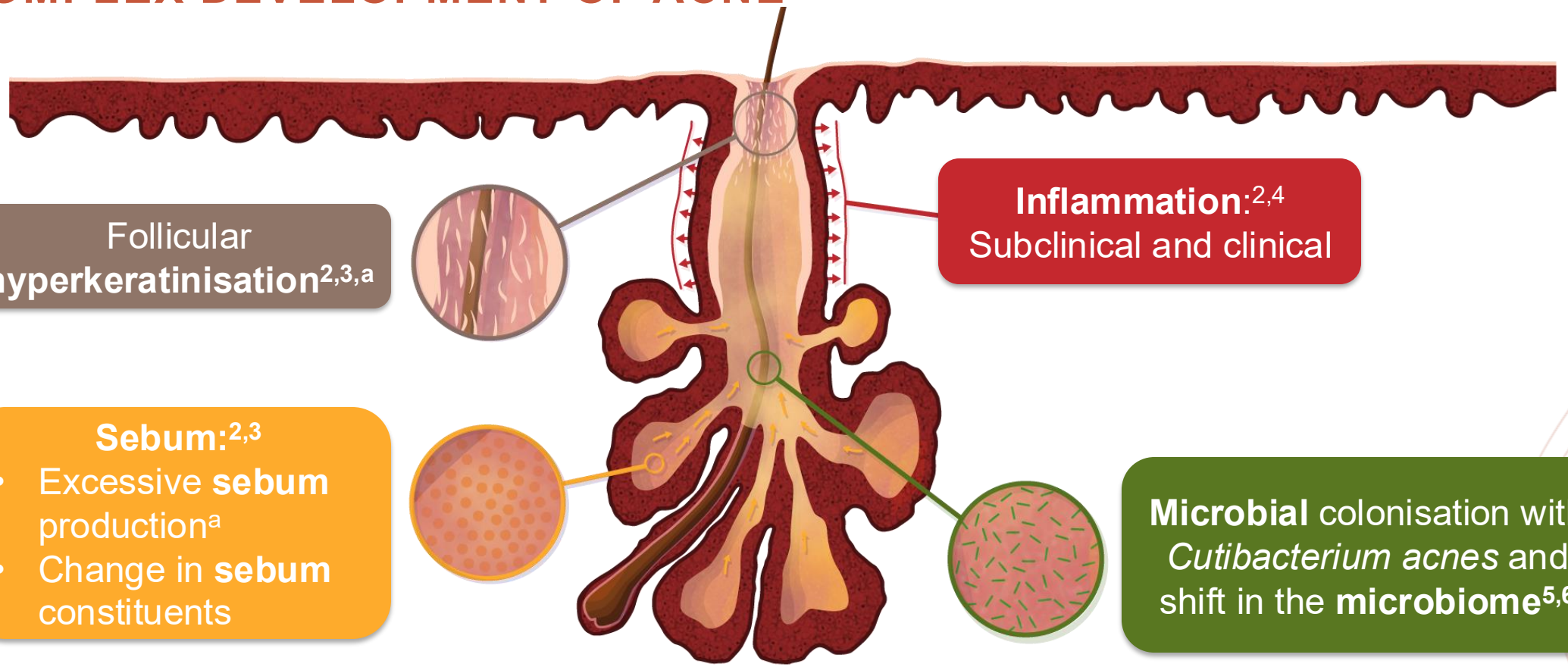


Open comedone

1. Plewig, G., Melnik, B. and Chen, W.C. (2019) Plewig and Kligman's Acne and Rosacea. 4th Edition, Springer, Berlin (chapter 3)

PATHOPHYSIOLOGY OF ACNE VULGARIS

THE FOUR PRIMARY PATHOGENIC FACTORS RESULTING IN THE COMPLEX DEVELOPMENT OF ACNE[1,2]



Follicular **hyperkeratinisation**[2,3,a]

Inflammation:[2,4] Subclinical and clinical

Sebum:[2,3]
- Excessive **sebum** production[a]
- Change in **sebum** constituents

Microbial colonisation with *Cutibacterium acnes* and shift in the **microbiome**[5,6]

Number and size of the sebaceous follicles are genetically determined

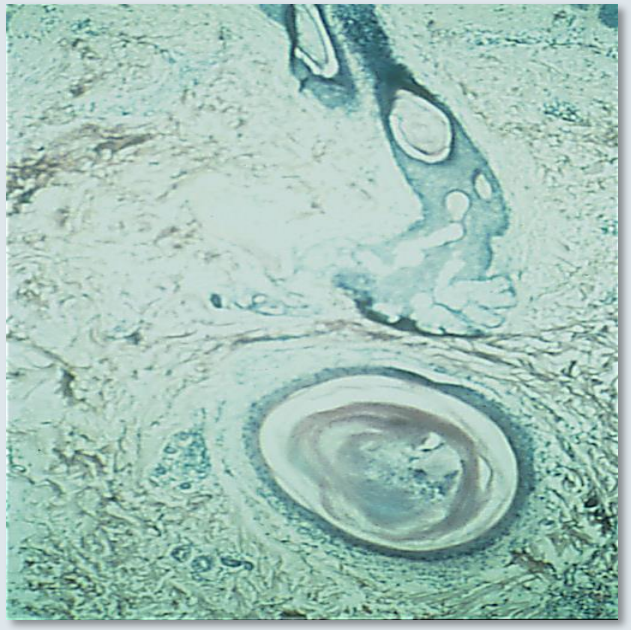
[a] Follicular hyperkeratinisation and excessive sebum production are mediated by hormonal regulation[3,5,6]

1. Williams HC, et al. Lancet. 2012;379(9813):361-72; 2. Zaenglein AL. N Engl J Med. 2018;379(14):1343-52; 3. Gollnick H, et al. J Am Acad Dermatol. 2003;49(1 Suppl):S1-S37; 4. Zaenglein AL, et al. J Am Acad Derm. 2016;74:945-73.e33; 5. Del Rosso JQ, Kircik L. J Dermatolog Treat. 2024;35(1):2296855; 6. Kim HJ, Kim YH. Int J Mol Sci. 2024;25(10):5302

DEVELOPMENT OF ACNE VULGARIS

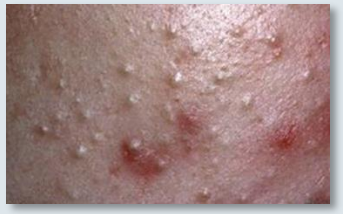
LESION PROGRESSION IN ACNE VULGARIS

EVOLUTION OF ACNE LESIONS[1,2]

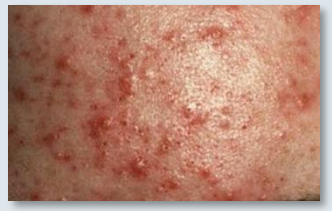


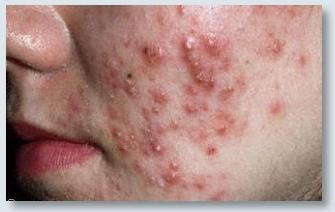
Microcomedo

- Not clinically visible
- Precursor to all clinical lesions



Comedonal acne





Inflammatory lesions

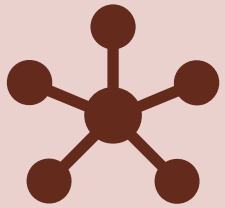
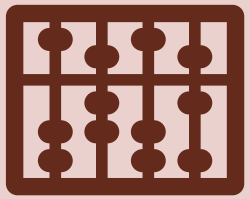
Scars

Images kindly provided by Prof. Layton

1. Thiboutot D, et al. J Am Acad Dermatol. 2009;60(5 Suppl):S1-S50. 2. Gollnick H, et al. J Am Acad Dermatol. 2003;49(1 Suppl):S1-S37

ACNE SEVERITY IS DIFFICULT TO EVALUATE

THERE ARE OVER 20 GRADING SYSTEMS[1,2]

Assessment tools			
Tool	**1. Global acne severity grading** 	**2. Acne lesion counting** 	**3. Multimodal digital imaging** 
Advantages	• Simple and quick to use over serial clinic visits • Estimates the full extent of involvement • Evaluates the range of aspects pertinent to severity[a] • Allows the clinician to observe the dominant lesions	• Precise, objective and highly discriminative • Quantifies the types of lesion present • Distinguishes small effects in therapeutic response • Allows examination of morphogenesis and evolution of individual lesions • Can provide continuous data for statistically analysis	• Permanent record of acne severity • Allows reliable recoding of change with time
Disadvantages	• Subjective assessment • Multiple variables (including variability between assessors) • Less sensitive to change • Too simplistic to provide useful insight	• Time consuming – not practical in the clinic • Intrusive for the patient • Dependent on external variables such as assessor's visual acuity, skin quality, and office lighting • Counting requires specialist knowledge and training to administer • Does not capture various clinical aspects of symptoms including concentration, distribution and size of lesions, or skin redness	• Difficulty with standardisation • Requires expensive equipment • Does not adequately detect small, noninflamed lesions • Two-dimensional images only – no account of palpation or lesion depth

[a] i.e. number, type and size of lesions, and presence and coverage of inflammation, erythema and seborrhoea

1. Agnew T, et al. J Clin Aesthet Dermatol. 2016;9(7):40-52; 2. Bae IH, et al. Ann Dermatol. 2024;36(2):65-73

ACNE SEVERITIES

ACNE SEVERITY DEFINED BY NICE GUIDELINE[1]

Acne severity varies along a continuum

For **mild-to-moderate** acne, this includes people who have 1 or more of:

- Any number of non-inflammatory lesions (comedones)
- Up to 34 inflammatory lesions with or without non-inflammatory lesions in the whole face
- Up to two nodules

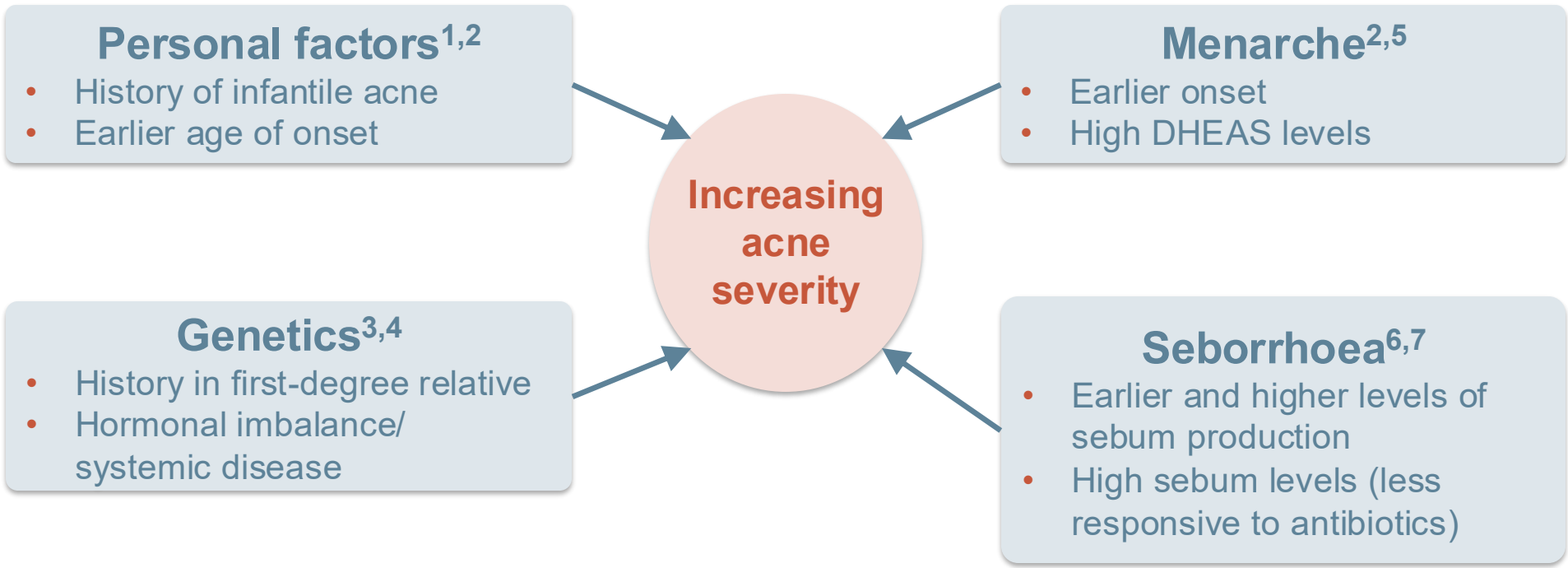
For **moderate-to-severe** acne, this include people who have either or both of:

- 35 or more inflammatory lesions (with or without non-inflammatory lesions)
- Three or more nodules

20% **of young people suffer from moderate-to-severe acne[2] and need adequate treatment**

1. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org;
2. Bhate K, Williams HC. Br J Dermatol. 2013;168(3):474-85

PATIENT ASSESSMENT
FACTORS POTENTIALLY INFLUENCING SEVERITY



DHEAS, dehydroepiandrosterone sulfate

1. Chew EW, et al. Clin Exp Dermatol. 1990;15(5):376-7; 2. Lucky, AW, et al. J Pediatr. 1997;130:30-9; 3. Sutaria AH, et al. Acne Vulgaris. [Updated 2023 Aug 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available here (accessed June 2025); 4. Lolis MS, et al. Med Clin North Am. 2009;93:1161-81; 5. Lucky AW. Dermatology. 1998;196:95-7; 6. Del Rosso JQ, Kircik L. J Dermatolog Treat. 2024;35(1):2296855; 7. Mourelatos K, et al. Br J Dermatol. 2007;156:22-31;

DISEASE BURDEN

IMPACT ON PATIENTS LIVING WITH ACNE VULGARIS

BEFORE YOU PROCEED: REFLECT BRIEFLY

HOW DO YOU THINK ACNE VULGARIS IMPACTS A PATIENT'S DAILY LIFE BEYOND PHYSICAL SYMPTOMS?

QUALITY OF LIFE DEFICIT IN ACNE

THE IMPACT ON PATIENTS LIVING WITH ACNE VULGARIS

Quality of Life (SF-36[a])

	Social functioning	Role fulfilment for emotional reasons	Mental health	Energy and vitality
Acne	*11.1*	*7.4*	*13.4*	*7.0*
Asthma	5.9	6.3	4.2	6.0
Diabetes	8.7	9.5	5.9	9.1
Back pain	8.9	6.9	4.1	8.5
Epilepsy	7.4	5.3	3.4	5.9

Acne patients report levels of **social, psychological and emotional problems** on a par with those reported by patients with what would normally be considered much more ‘serious’ general chronic disabling medical conditions.

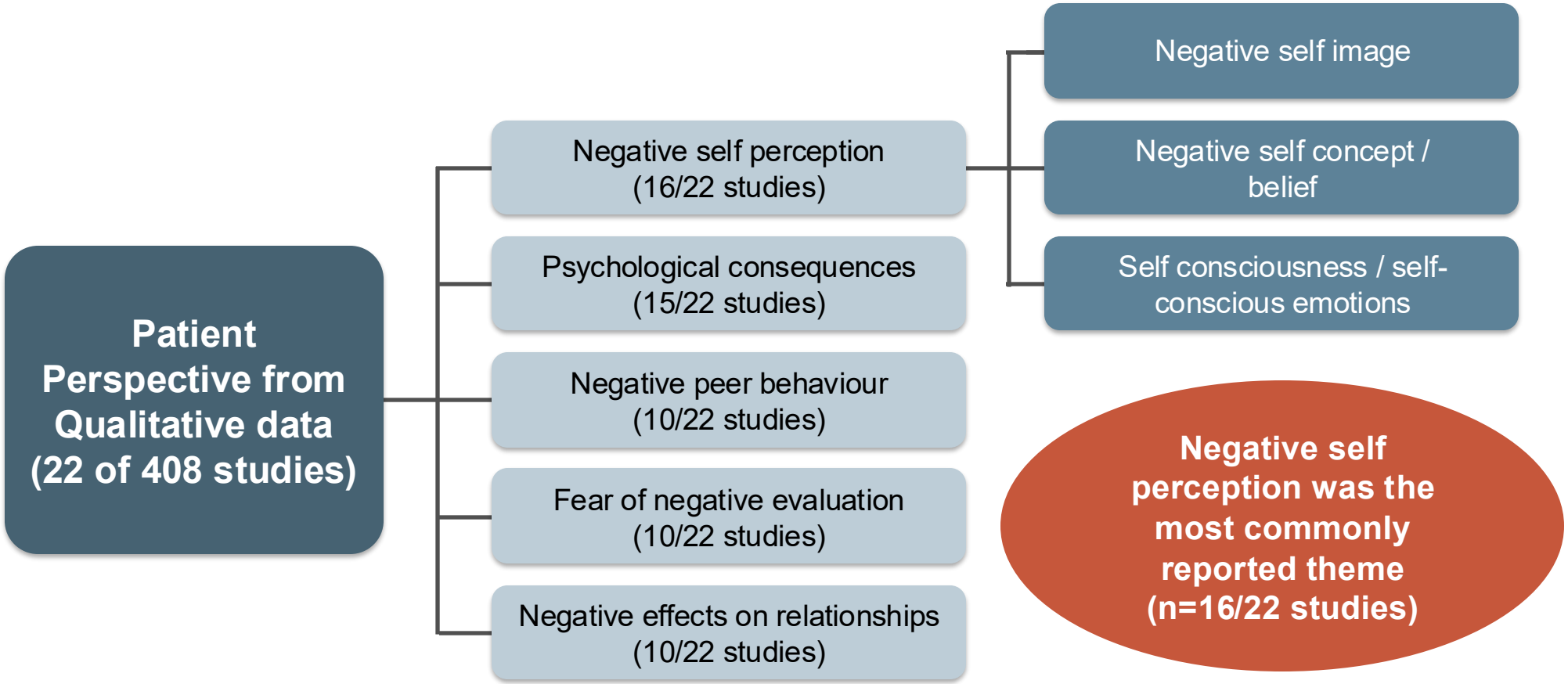
[a] SF-36 scores range from 1–100

SF-36, Short Form-36 Health Survey

Mallon E, et al. Br J Dermatol. 1999;140(4):672-6

DISEASE BURDEN

IDENTIFICATION OF THE IMPACT – HOW ACNE MAKES YOU FEEL?



Smith H, et al. Am J Clin Dermatol. 2021;22(2):159-171

PSYCHOLOGICAL WELL-BEING IN ADOLESCENTS WITH ACNE

INCREASED SUICIDAL IDEATION, MENTAL HEALTH PROBLEMS AND SOCIAL IMPAIRMENT

- Cross-sectional, questionnaire-based study
  - 3775 adolescents
  - 18-19 years old
  - 14% having substantial acne (a lot and very much)

	Suicidal thoughts	
	With “very much” acne[a]	No or “little” acne[a]
Women, %	25.5	11.9
Men, %	22.6	6.3

[a] Possible responses to answer on occurrence of pimples the previous week were *no, yes – a little, yes – a lot, and yes – very much*

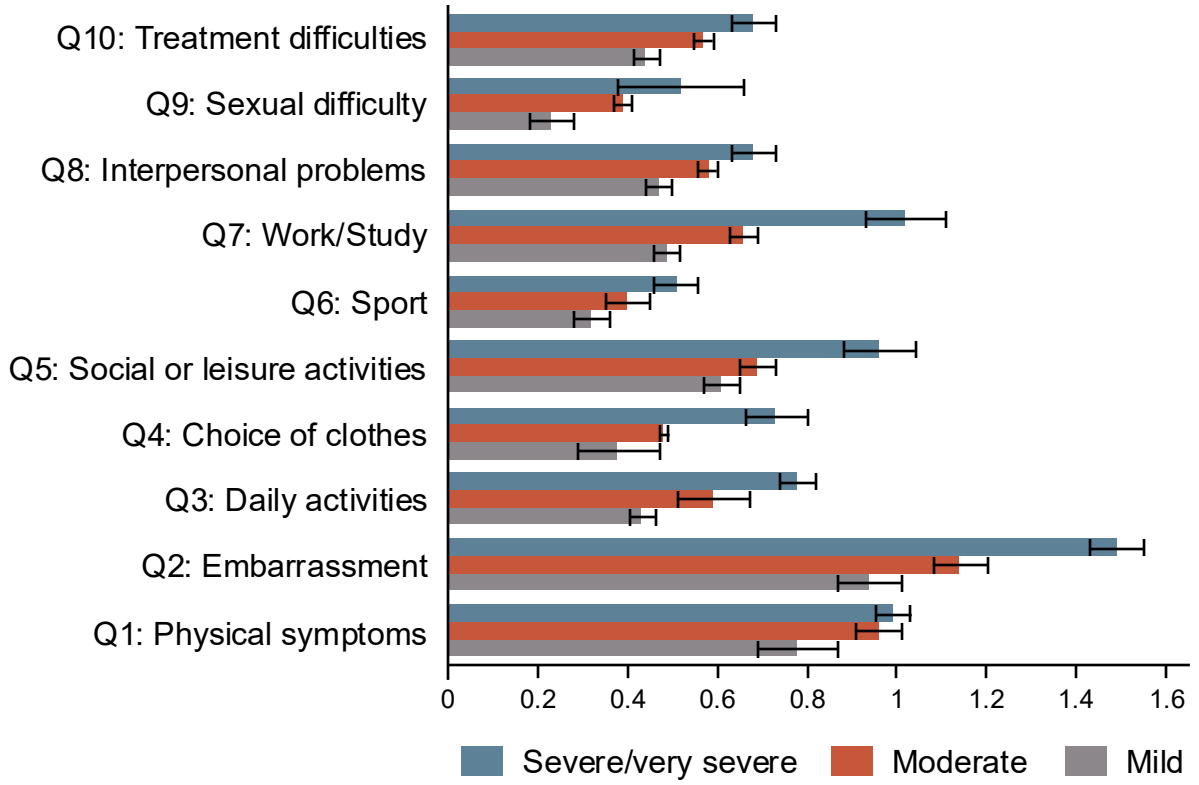
Halvorsen JA, et al. J Invest Dermatol. 2011;131(2):363-70

THE BURDEN OF ACNE SCARS

HIGHLIGHTING THE SIGNIFICANT PSYCHOSOCIAL IMPACT OF ACNE SCARS

- High psychosocial impact of acne scars
- Patients frequently feel uncomfortable and embarrassed

Mean (SEM) DLQI score by acne scars severity (Scored from 0 to 3)[a]



[a] Mean (SEM) DLQI scores for each questionnaire item (*Q*1–*Q*10) based on acne scarring severity grades. Each question was scored from a minimum of 0 (i.e. no impact on HRQoL) to a maximum of 3 (i.e. very strong impact on HRQOL)

DLQI, Dermatology life Quality Index; HRQoL, health-related quality of life; SEM, standard error of the mean

Tan J, et al. Am J Clin Dermatol. 2022;23(1):115-123; 2. Tan J, et al. JAAD Int. 2021;3:102-110

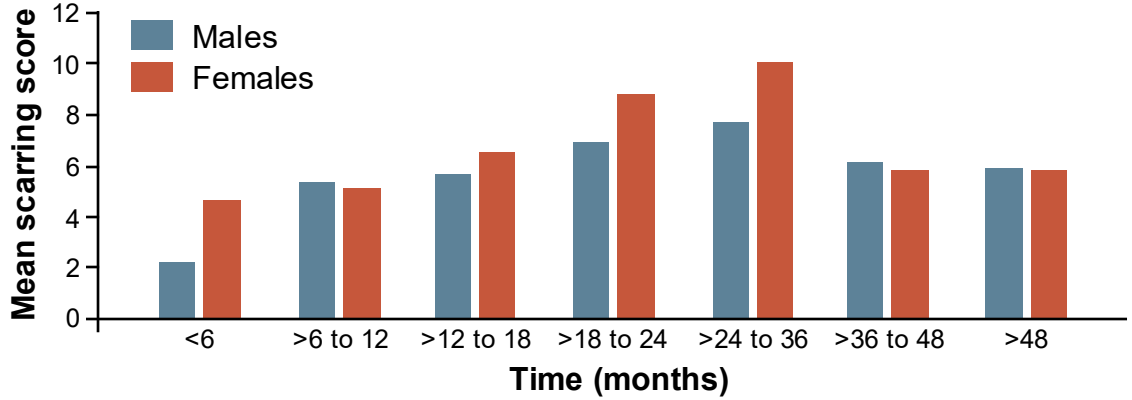
THE BURDEN OF ACNE SCARS IS HIGH

EARLY TREATMENT MAY HELP PREVENT THEM

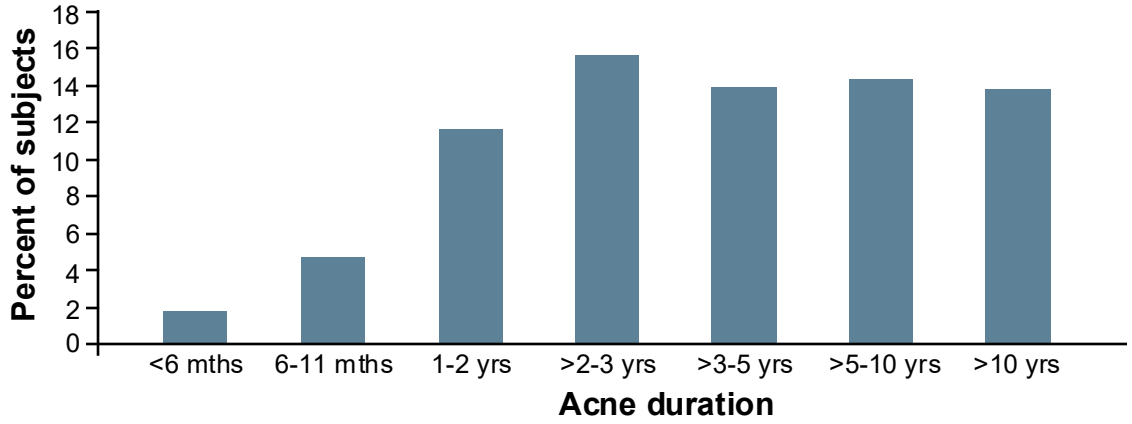
- Establish how long the acne has been present[1,2]
- More frequent in severe / very severe acne[3]
  - May arise from mild acne in susceptible individual
- The degree and duration of clinical inflammation influences resultant scarring[3]
- Select appropriate therapy to reduce inflammatory acne[3,4]

Early treatment targeting inflammation likely to reduce scarring[4]

Duration of time before adequate acne treatment[3]



Increasing clinically relevant acne scarring (overall SCAR-S scores ≥2) with duration of acne[5]



mths, months; yrs, years;
SCAR-S, Scar Cosmesis Assessment and Rating scale – Simplified

1. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org; 2. DermNet. Acne vulgaris. Available here (accessed June 2025); 3. Layton AM, et al. Clin Exp Dermatol. 1994;19(4):303-8; 4. Kurokawa I, et al. Dermatol Ther (Heidelb). 2021;11(4):1129-1139; 5. Tan JK, et al. J Cutan Med Surg. 2010;14(4):156-60

THE EVOLVING TREATMENT LANDSCAPE IN ACNE VULGARIS

TREATMENTS, MECHANISMS OF ACTION, SAFETY AND EFFICACY AND ADMINISTRATION

BEFORE YOU PROCEED: REFLECT BRIEFLY

ARE YOU FAMILIAR WITH MOST RELEVANT TREATMENTS FOR ACNE VULGARIS AND HOW THEY TARGET THE KEY PATHOGENIC FACTORS?

TREATMENTS FOR ACNE VULGARIS
UNDERSTANDING TREATMENT APPROVALS AND AVAILABILITY

- This micro learning focuses on **evidence-based treatments** for acne vulgaris, as supported by the latest **international guidelines** (American,[1] UK,[2] and European[3]) and **scientific data**
- While these treatments are widely recognised in clinical practice, **regulatory approval** and **market availability** vary across **countries**
- The goal of this module is to offer a comprehensive overview of current evidence-based options, regardless of regional variation in approval or access

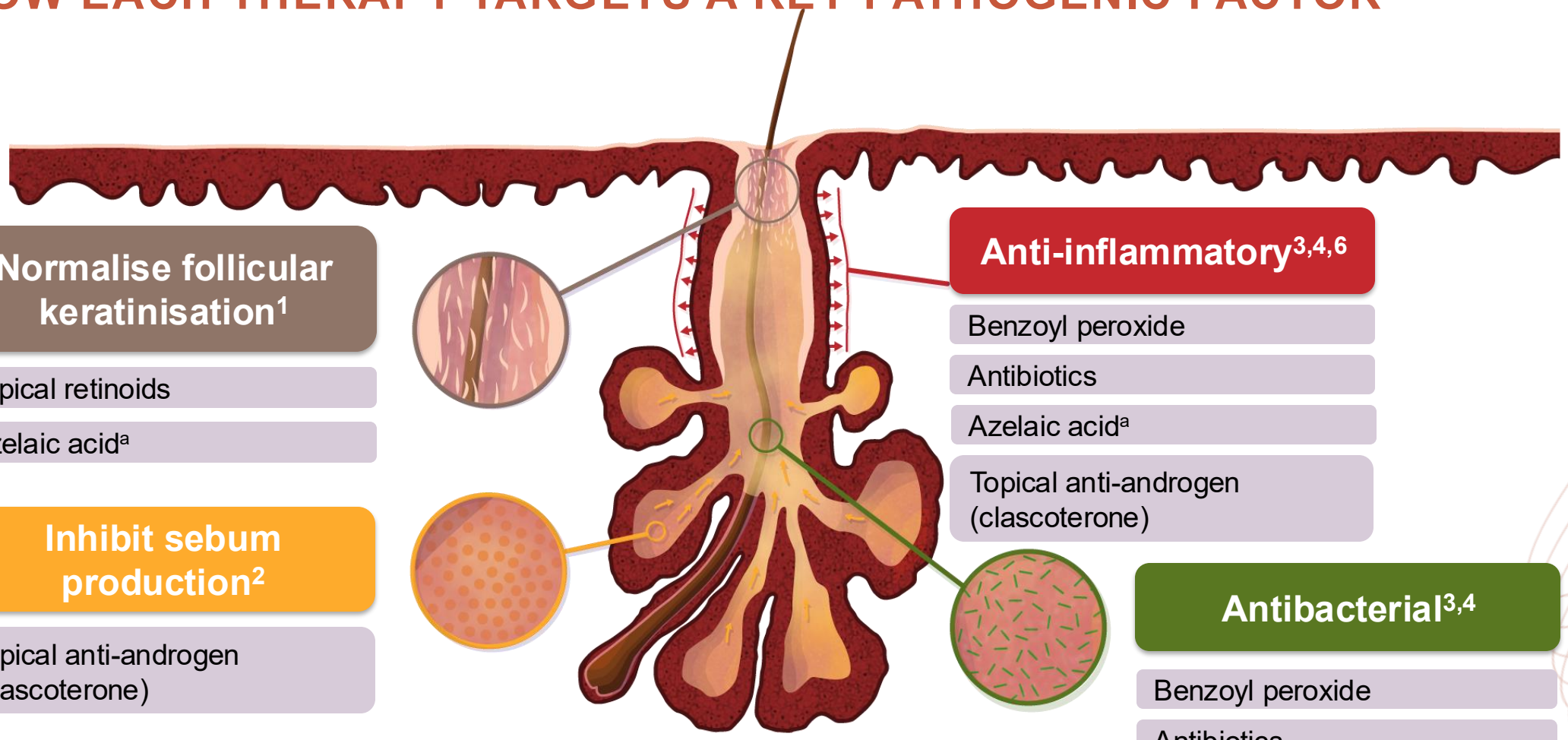
Please note that local prescribing practices, reimbursement, and product availability may differ depending on national regulatory frameworks

UK, United Kingdom

1. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30; 2. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org; 2. EDF. S3-Guideline for the Treatment of Acne (Update 2016). Available here (accessed May 2025)

OVERVIEW OF TOPICAL TREATMENT OPTIONS FOR ACNE VULGARIS

HOW EACH THERAPY TARGETS A KEY PATHOGENIC FACTOR



Normalise follicular keratinisation[1]

- Topical retinoids
- Azelaic acid[a]

Inhibit sebum production[2]

- Topical anti-androgen (clascoterone)

Anti-inflammatory[3,4,6]

- Benzoyl peroxide
- Antibiotics
- Azelaic acid[a]
- Topical anti-androgen (clascoterone)

Antibacterial[3,4]

- Benzoyl peroxide
- Antibiotics
- Azelaic acid[a]

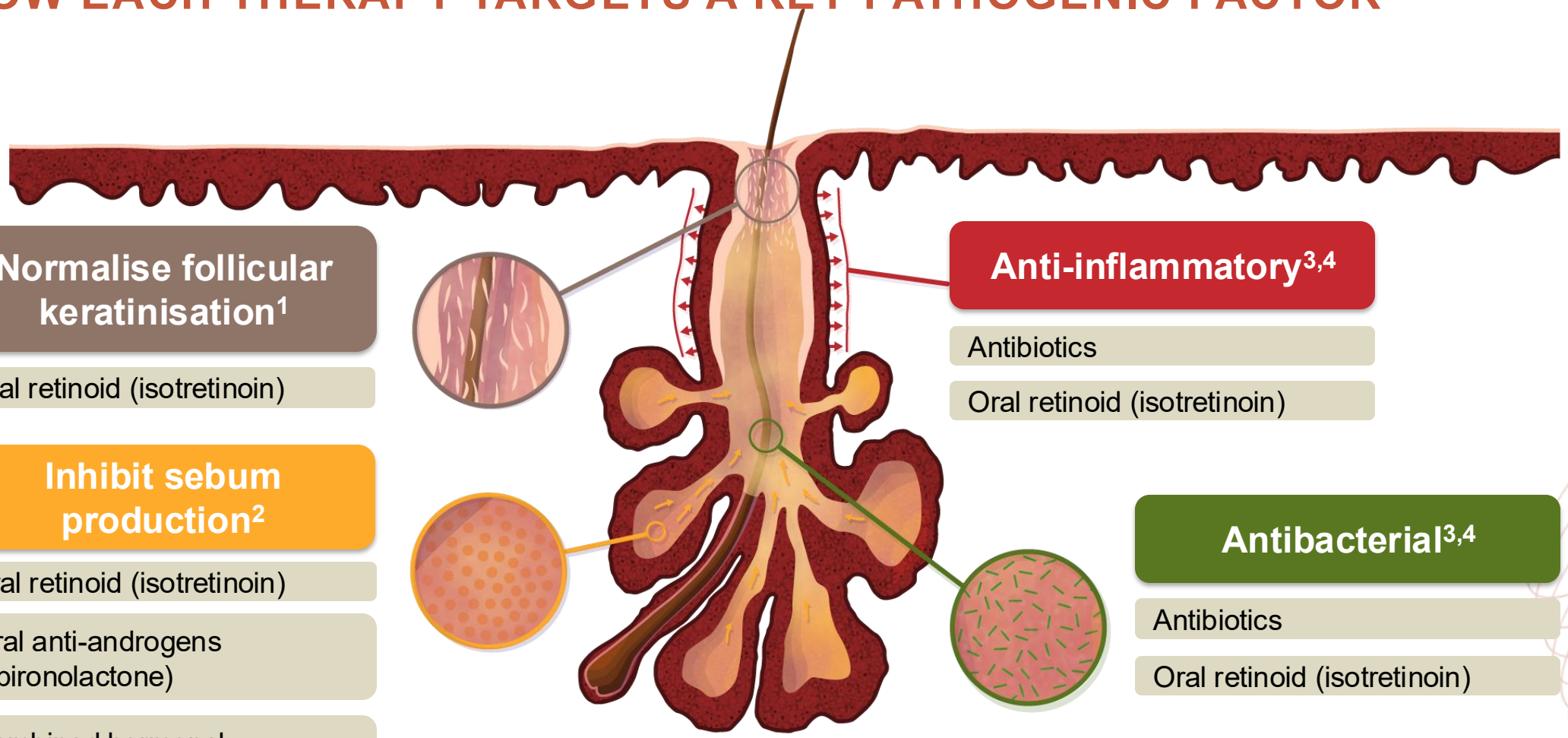
Topical

[a] Azelaic acid has diverse physiological activities, including antimelanogenic antioxidant effects[5]

1. Sutaria AH, et al. Acne Vulgaris. [Updated 2023 Aug 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available here (accessed June 2025); 2. Hebert A, et al. JAMA Dermatol. 2020;156(6):621-630; 3. DermNet. Benzoyl peroxide. Available here (accessed June 2025); 4. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30; 5. Feng X, et al. Clin Cosmet Investig Dermatol. 2024;17:2359-2371; 6. Eichenfield LF, et al. J Drugs Dermatol. 2024 ;23(1):1278-1283.

OVERVIEW OF SYSTEMIC TREATMENT OPTIONS FOR ACNE VULGARIS

HOW EACH THERAPY TARGETS A KEY PATHOGENIC FACTOR



Normalise follicular keratinisation[1]

- Oral retinoid (isotretinoin)

Inhibit sebum production[2]

- Oral retinoid (isotretinoin)
- Oral anti-androgens (spironolactone)
- Combined hormonal contraceptives

Anti-inflammatory[3,4]

- Antibiotics
- Oral retinoid (isotretinoin)

Antibacterial[3,4]

- Antibiotics
- Oral retinoid (isotretinoin)

Oral/systemic

1. Ganceviciene R, Zouboulis CC. J Dtsch Dermatol Ges. 2010;8 Suppl 1:S47-59; 2. Lam C, Zaenglein AL. Clin Dermatol. 2014;32(4):502-15; 3. Sutaria AH, et al. Acne Vulgaris. [Updated 2023 Aug 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available here (accessed June 2025); 4. Pile HD, et al. Isotretinoin. [Updated 2025 Mar 4]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available here (accessed June 2025); 5. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30

TOPICAL RETINOIDS (1/2)

TRETINOIN, ADAPALENE, TAZAROTENE AND TRIFAROTENE[a]

1960s | 1970s | 1980s | 1990s | 2000s | 2010s

Tretinoin (retinoic acid)[1]
- Strong comedolytic effect[2]

Adapalene (1996)[1]
- Same efficacy as tretinoin, less irritating. Commonly used for acne management[3]

Tazarotene (1997)[1]
- Only available in some countries[4]

Trifarotene (2019)[1]
- Selectively targets retinoic acne receptor (RAR) gamma licensed for both facial AND truncal acne[5]

Mode of action

- Primary: **Desquamation & normalise keratinization.** Promote shedding of abnormal epithelium, altering microclimate in microcomedones[1,2,6]
- Resolves mature comedones and prevents the formation of new ones[6]
- Enhances the penetration and effectiveness of other topical treatments like antibiotics[7]
- Reduces inflammation by activating TLR-2 (Toll-like receptor 2), reducing acne-related redness and swelling[8]
- No direct antibacterial effect: Makes follicles more accessible to antimicrobials, creating synergistic effects[2,6,9]

[a] May vary according to country

1. Baldwin H, et al. Am J Clin Dermatol. 2021;22(3):315-327; 2. Leyden J, et al. Dermatol Ther (Heidelb). 2017;7(3):293-304; 3. Tu P, et al. J Eur Acad Dermatol Venereol. 2001;15 Suppl 3:31-6; 4. Han G, et al. J Clin Aesthet Dermatol. 2020;13:E59-E65; 5. Annunziata MC, et al. Dermatol Ther (Heidelb). 2025;15(2):245-264; 6. Motamedi M, et al. J Cutan Med Surg. 2022;26(1):71-78; 7. Dreno B. Drugs. 2004;64:2389-97; 8. Zhang B, et al. Biomed Sermatol 3, 4 (2019); 9. Dessinioti C, Katsambas A. Dermatol Ther (Heidelb). 2024;14(1):31-44

TOPICAL RETINOIDS (2/2)

TRETINOIN, ADAPALENE, TAZAROTENE AND TRIFAROTENE

Clinical effects

- Possible acne flare in the first weeks due to increased epidermal proliferation[1,2]
- Stimulates blood flow and collagen production,[3,4] speeding up healing

Pharmacokinetics

- Minimal systemic absorption[5]

Side effects[6,7]

- Erythema, dryness, itching, stinging (varies by vehicle, skin type, frequency, and mode of application)
- Trifarotene receptor specific aimed to enhance tolerability

Indications

- Topical retinoids can be used by both males and females[8]
  - should be avoided in pregnancy and in patients aiming to conceive[7]
- For comedonal and mild inflammatory acne, and / or as part of maintenance therapy[7,9]
- Often used in combination with benzoyl peroxide or antibiotics and can be effective for mild, moderate and severe acne[7]

1. Del Rosso JQ, editors. J Clin Aesthet Dermatol. 2008;1:41-3; 2. Dreno B, et al. J Drugs Dermatol. 2022;21:734-740; 3. Harvard Health Publishing. Do retinoids really reduce wrinkles? Available here (accessed June 2025); 4. Sitohang IBS, et al. Int J Womens Dermatol. 2022;8(1):e003; 5. Chien A, et al. J Drugs Dermatol. 2018;17(12):s51-55; 6. Motamedi M, et al. J Cutan Med Surg. 2022;26(1):71-78; 7. NICE. Acne vulgaris: Topical retinoids. Available here (accessed June 2025); 8. Dermatology Advisor. Racial and Sex Differences Observed in the Efficacy of Once-Daily Tretinoin for Acne. Available here (accessed June 2025); 9. DermNet. Topical retinoids. Available here (accessed June 2025)
Annunziata MC, et al. Dermatol Ther (Heidelb). 2025;15(2):245-264;

BENZOYL PEROXIDE[1]

A KEY TOPICAL TREATMENT FOR ACNE

History

- Leading over-the-counter topical treatment[1]
- Widely used since the late 1970s[1]

Mode of action[1]

- Primary: Powerful **antimicrobial**: Rapidly reduces *C. acnes* by 90% and free fatty acids by 40% within days
- Anti-inflammatory: Reduces oxygen free radicals, stimulates epidermal mitosis
- Slightly comedolytic

Pharmacokinetics[1]

- Decomposes in light, rapidly metabolised to benzoic acid on skin, no systemic absorption

Side effects

- Moderate irritation, dryness, scaling[1]
- Bleaches clothes, bed linen, hair[1]
- Rare contact allergy[1]
- Recent safety concerns[2]
  - No issues when stored at correct temperature[3,4]
  - The American Academy of Dermatology recommends patients to store the product at room temperature or cooler[4]

Indication

- Suitable for individuals aged 12 and above[5]
- Mild inflammatory acne, part of combination therapies in moderate to severe acne[6,7]

1. Plewig, G., Kligman, A.M. (1993). Benzoyl Peroxide. In: ACNE and ROSACEA. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-97234-8_75; 2. AAD statement of Benzoyl Peroxide in OTC Personal Care Products. Available here (accessed June 2025); 3. Garate D, et al. J Am Acad Dermatol. 2024;91(5):966-8; 4. Veenstra J, et al. J Am Acad Dermatol. 2024;91(3):533-4; 5. NHS. Who can and cannot use benzoyl peroxide. Available here (accessed June 2025); 6. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org; 7. Nast A, et al. JEADV. 2016;30:1261-1268

AZELAIC ACID[1,2]

History[1]

- Approved by the FDA in 2002 for papulopustular rosacea; now commonly used as a second-line treatment for acne vulgaris

Mode of action[1,2]

- Comedolytic, higher concentrations (e.g. ~20–30%) are **anti-bacterial**; anti-inflammatory effects, lightening effect on hyperpigmentation
- Acts through multiple mechanisms

Pharmacokinetics[1]

- Poor percutaneous absorption (3-5% retained in the skin), enhanced with gel formulations (up to 8%)

Efficacy[1]

- Effective in treating both non-inflammatory and inflammatory acne, with significant improvement in post-inflammatory hyperpigmentation
- Slow onset of action[a]

Safety / side effects[1]

- Well tolerated; Mild irritation

Indication[1]

- Suitable for individuals aged 12 and above
- Safe in pregnancy[3]

[a] Personal note

FDA, Food and Drug Administration

1. Feng X, et al. Clin Cosmet Investig Dermatol. 2024;17:2359-2371; 2. Plewig, G., Melnik, B. and Chen, W.C. (2019) Plewig and Kligman's Acne and Rosacea. 4th Edition, Springer, Berlin (chapter 7); 3. Ly S, et al. Dermatol Ther (Heidelb). 2023;13(1):115-130

TOPICAL ANTI-ANDROGEN

CLASCOTERONE IS A TOPICAL TREATMENT OPTION FOR ACNE IN MALES AND FEMALES

History

- Clascoterone cream was approved by the FDA in 2020 and by the UK MHRA in 2025 based on 2 Phase 3 studies[1,2]

Mode of action

- First-in-class topical anti-androgen, reduces **sebum production**[3]
- Anti-inflammatory: Inhibits the transcription of androgen-responsive genes including inflammatory cytokines[3]

Pharmacokinetics

- Only local, not systemic, antiandrogenic activity[4]

Efficacy

- Clascoterone is effective in the treatment of acne vulgaris, showing statistically significant improvements in all primary and secondary efficacy endpoints[4]

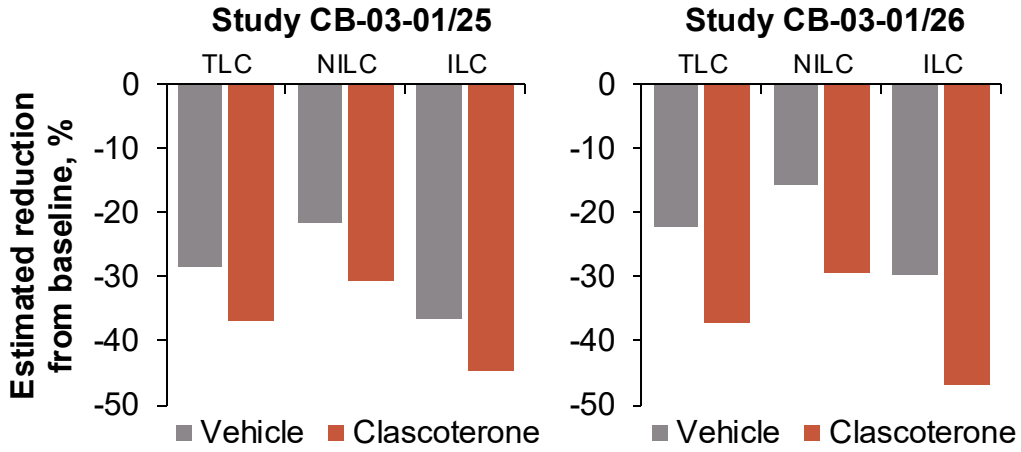
Safety / side effects

- Adverse events rates are low and mostly mild[4]
  - The predominant local skin reaction was trace or mild erythema

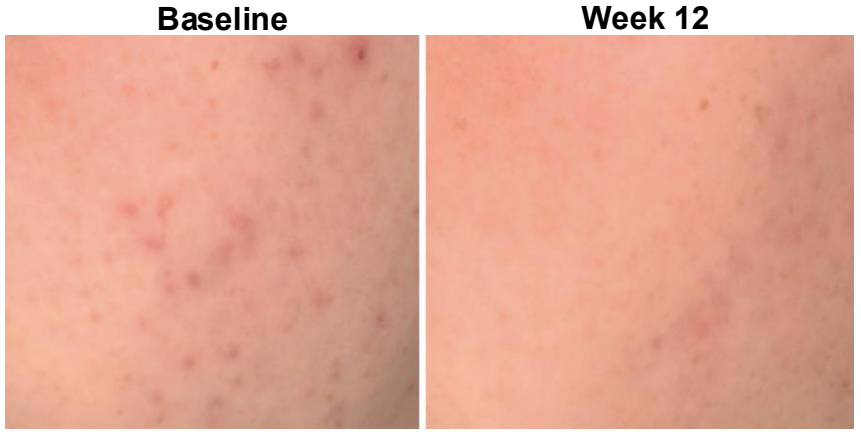
Indication

- Suitable for individuals aged 12 and above[3]
- Clascoterone can be used as part of a multimodal approach with other fixed combination products or oral therapies available for acne management, addressing more key pathophysiological factors

Efficacy – change in lesion reduction[4]



Improvement of acne[4]



FDA, Food and Drug Administration; MHRA, Medicines and Healthcare Products Regulatory Agency; UK, United Kingdom

1. Piszczatoski CR, Powell J. Clin Ther. 2021;43(10):1638-1644; 2. FirstWord PHARMA. Cosmo and Glenmark Announces UK MHRA Approval of Winlevi for Treatment of Acne. Available here (accessed June 205); 3. Eichenfield LF, et al. J Drugs Dermatol. 2024;23(1):1278-1283; 4. Hebert A, et al. JAMA Dermatol. 2020 ;156(6):621-630;

ANTIBIOTICS FOR THE TREATMENT OF ACNE
GUIDELINE DRIVEN ANTIBIOTIC USE

- Oral antibiotics remain important but should be limited due to global AMR concerns[1-3]
  - Limit treatment to 3 months (up to 6 months in select cases)[1,2]
  - Combine with benzoyl peroxide to reduce resistance[1]
- Prefer doxycycline, lymecycline, or sarecycline (narrow spectrum) over minocycline[1,2]
  - Avoid minocycline due to the risk of severe eruptions and neurological side effects[2]
- Limit trimethoprim-sulfamethoxazole due to risk of rare, but severe hypersensitivity reactions[1]
  - Stevens-Johnson syndrome/toxic epidermal necrolysis
  - Acute respiratory failure
- Reserve macrolides (e.g. erythromycin) for specific cases only[2]
  - e.g. during pregnancy or in patients where tetracyclines are contraindicated
- Stop antibiotics once control is achieved and start maintenance therapy[1,3,4]

AMR, antimicrobial resistance

1. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30; 2. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org; 3. Nast A, et al. JEADV. 2016;1261-1268; 4. Zaenglein AL, et al. J Am Acad Derm. 2016;74:945-73.e33

ORAL RETINOID
ISOTRETINOIN

History[1]

- Discovered in 1971, registered for severe acne since 1982

Mode of action[1]

- Primary: Apoptosis-mediated **sebum suppression** in sebaceous glands
- Changes gene-expression leading to altered terminal differentiation of keratinocytes and anti-inflammatory effects

Pharmacokinetics[1]

- Systemic absorption: rapidly absorbed, bioavailability 25%, significantly increased with intake of fatty food

Efficacy[2]

- Most effective acne drug

Safety / side effects[1]

- Teratogenic
- Strict contraception in all women in childbearing age
- Side effects like vitamin-A hypervitaminosis (xeroderma, lipid/liver enzyme elevations [among others])
- Conflicting data on depression/suicidal intents

Indication[1]

- Conglobate acne, severe acne, scarring acne, acne resistant to other therapies

1. Plewig, G., Melnik, B. and Chen, W.C. (2019) Plewig and Kligman's Acne and Rosacea. 4th Edition, Springer, Berlin (chapter 7);
2. Huang CY, et al. Ann Fam Med. 2023;21:358-369

COMBINED HORMONAL CONTRACEPTIVES

History

- Introduced in the 1960s as birth control[1]

Mode of action

- Reduce **sebaceous gland activity**, mediated by a reduced level of circulating androgens[2]

Pharmacokinetics

- Orally absorbed, metabolised by the liver, and reduces free androgens[3]

Efficacy

- Efficient in the treatment of acne and reduce inflammatory and comedonal lesions[4]
- Full effect after 6–9 months of use[5]
- No superiority of one combined hormonal contraceptive over the other for the treatment of acne[6]

Safety / side effects

- Generally well-tolerated[5]
- Systematic reviews exhibit an increased risk of breast cancer and cervical cancer[5]

Indication

- Although not licensed for acne in all countries may help moderate to severe acne in females and may be used when a female with acne requires contraception or requires them for hormonal reasons[4,7]
- Contraindicated in the case of genetic clotting disorders, positive history of venous thromboembolism, heart disease, hypertension, obesity, smoking in women older than 35 years of age, diabetes mellitus, liver disease, migraine and headache, prolonged immobilisation, history of breast, endometrial and liver malignancy, pregnancy and breastfeeding, and hypersensitivity to any component of the product[5]

1. Christin-Maitre S. Best Pract Res Clin Endocrinol Metab. 2013;27(1):3-12; 2. Zaenglein AL, et al. J Am Acad Derm. 2016;74:945-73.e33; 3. Elliman A. BMJ Sex Reprod Health. 2000;26:109-111; 4. Arowojolu AO, et al. Cochrane Database Syst Rev. 2012;2012(7):CD004425; 5. Plewig, G., Melnik, B. and Chen, W.C. (2019) Plewig and Kligman's Acne and Rosacea. 4th Edition, Springer, Berlin (chapter 7); 6. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30; 7. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org

ORAL ANTI-ANDROGEN
SPIRONOLACTONE

History
- Spironolactone used off-label to treat acne vulgaris in women[1]
  - Based on the evidence for use in two independent large clinical studies[1,2]

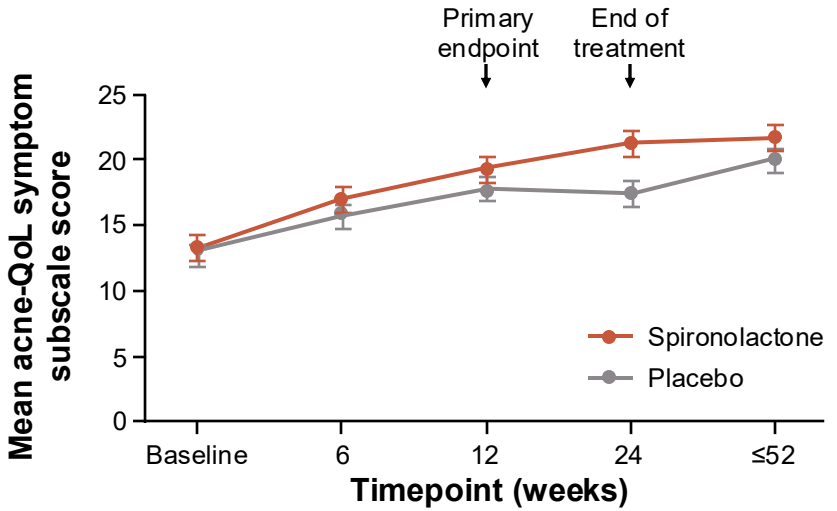
Mode of action
- An oral anti-androgen to reduce **sebum production**[1,2]

Efficacy
- Improves acne compared to placebo[1] and doxycycline[2]
- Greater improvements at 6 months than at 3 months[1]

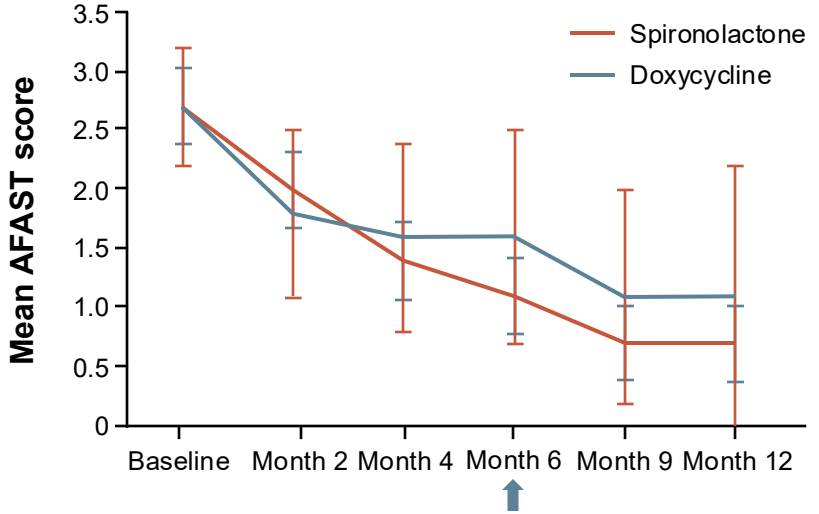
Safety / side effects
- Well tolerated[1,2]
  - SAFA trial: more headaches (no SAEs)[2]
  - Most spironolactone-related AEs in the FASCE study were mild to moderate events of irregular menstruation and did not lead to withdrawal of the patients from treatment[1]

Indication
- May be an effective alternative to oral antibiotics for women with persistent acne who have not responded to first-line topical treatments[2]

Mean Acne-QoL symptom subscale score by time point for each treatment group[2]



Evolution of the global AFAST score[1]



AE, adverse event; Acne-QoL, Acne-Specific Quality of Life; AFAST, Adult Female Acne Scoring Tool; SAE, serious adverse events

1. Dréno B, et al. Acta Derm Venereol. 2024;104:adv26002; 2. Santer M, et al. Drug Ther Bull. 2023;62(1):6-10

MULTIMODAL TREATMENT STRATEGIES

TREATMENT APPROACHES ACROSS THE PATIENT JOURNEY AND DISEASE SEVERITIES

BEFORE YOU PROCEED: REFLECT BRIEFLY

IS A MULTIMODAL APPROACH MORE EFFECTIVE IN MANAGING ACNE VULGARIS COMPARED TO MONOTHERAPY? IF YES, WHY?

COMBINATIONS OF THE TREATMENTS FOR ACNE VULGARIS

THE IMPORTANCE OF A MULTIMODAL APPROACH

- Addressing as **many pathophysiological factors** implicated in **acne** as possible leads to **better outcomes**[1,2]
- A multimodal approach works **more rapidly** for patients[2]
- **Adherence** is improved with preferably **fixed combination therapies** which are more **convenient** for patients to use[3]
- More rapid control of inflammatory processes translates to **less distressing** and **disfiguring sequelae**[4]

1. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org; 2. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30; 3. Yentzer BA , et al. Cutis. 2010;86(2):103-8; 4. Dréno B, Gold LS. Dermatol Ther (Heidelb). 2021;11(4):1075-1078

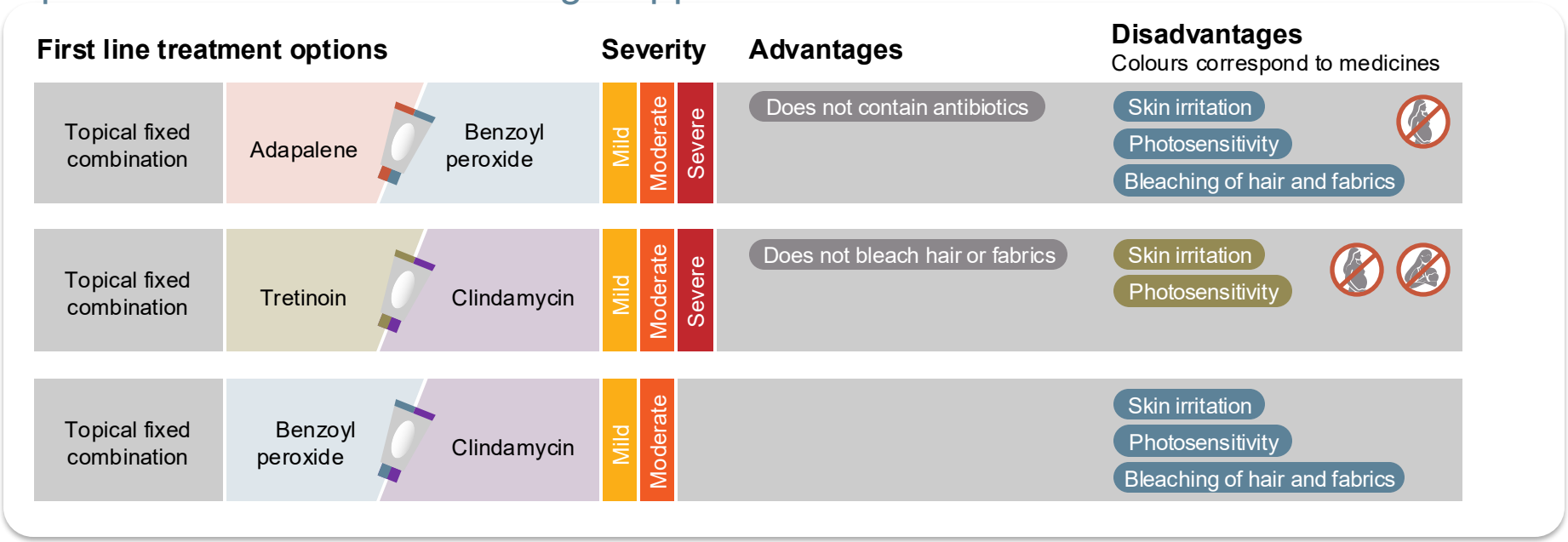
MANAGING ACNE VULGARIS: NICE GUIDELINES (1/2)

EVIDENCE-BASED RECOMMENDATIONS FOR MULTIMODAL TREATMENT

- Offer a 12-week course of first-line treatment
- Explain that positive effects may take 6-8 weeks to appear
- Take into account patient preference and acne severity
- Discuss the advantages and disadvantages of treatment

Therapy options (part 1)

Topical fixed combination – Single-application



National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org

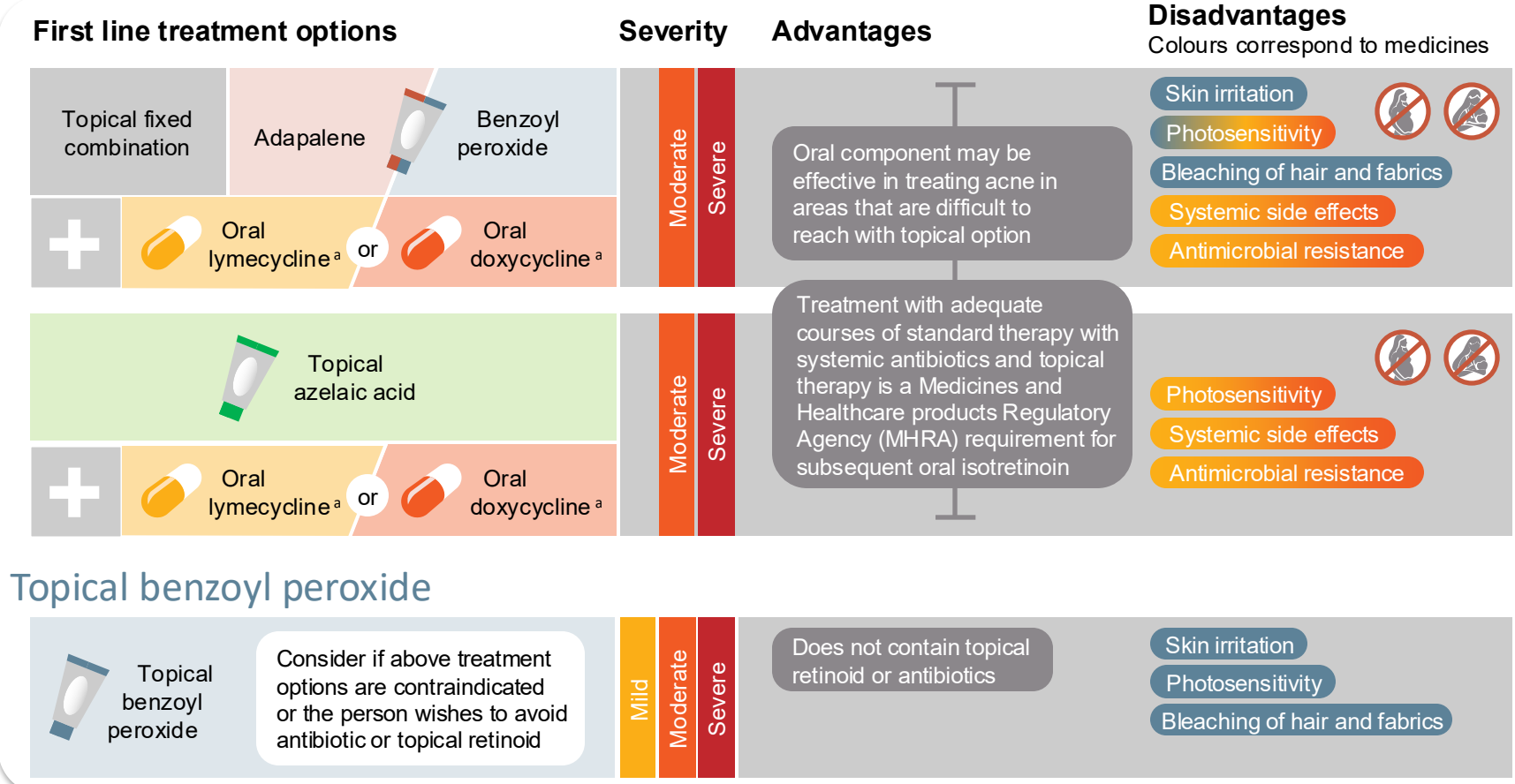
Infographic adapted from Xu et al. (2021)
Xu J, et al. BMJ. 2021;374:n1800

MANAGING ACNE VULGARIS: NICE GUIDELINES (2/2)

EVIDENCE-BASED RECOMMENDATIONS FOR MULTIMODAL TREATMENT

Therapy options (part 2)

Combined use of separate topical and oral agents



Maintenance

- Encourage continued appropriate skin care
- Consider maintenance treatment in people with a history of frequent relapse after treatment
  - A fixed combination of topical adapalene and topical benzoyl peroxide
  - If not tolerated, or contraindicated: topical monotherapy with adapalene, benzoyl peroxide or azelaic acid

[a] or consider trimethoprim or oral macrolide

National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org

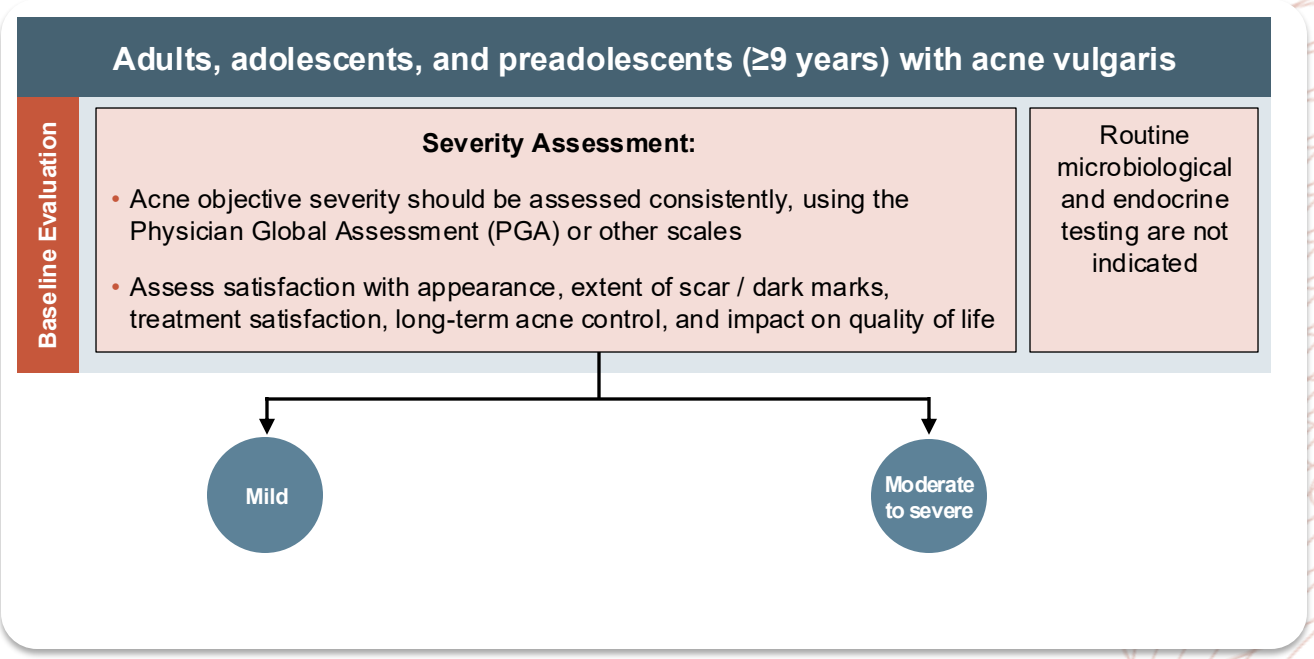
Infographic adapted from Xu et al. (2021)

Xu J, et al. BMJ. 2021;374:n1800

MANAGING ACNE VULGARIS: AAD GUIDELINES (1/2)
EVIDENCE-BASED RECOMMENDATIONS FOR MULTIMODAL TREATMENT

- The AAD 2016 acne vulgaris **guidelines**[1] were updated in **2024** with **18 evidence-based recommendations** and **5 good practice statements**[2]
- **Strong recommendations for:** topical benzoyl peroxide, retinoids, antibiotics, oral doxycycline; oral isotretinoin for severe or treatment-resistant acne[2]
- **Conditional recommendations for:** topical clascoterone, salicylic acid, azelaic acid, oral minocycline, sarecycline, combined oral contraceptives, and spironolactone[2]
- **Good clinical practices:** combining topical therapies with multiple mechanisms, limiting systemic antibiotics, and using intralesional corticosteroid injections[2]

Management of AV (part 1)[2]

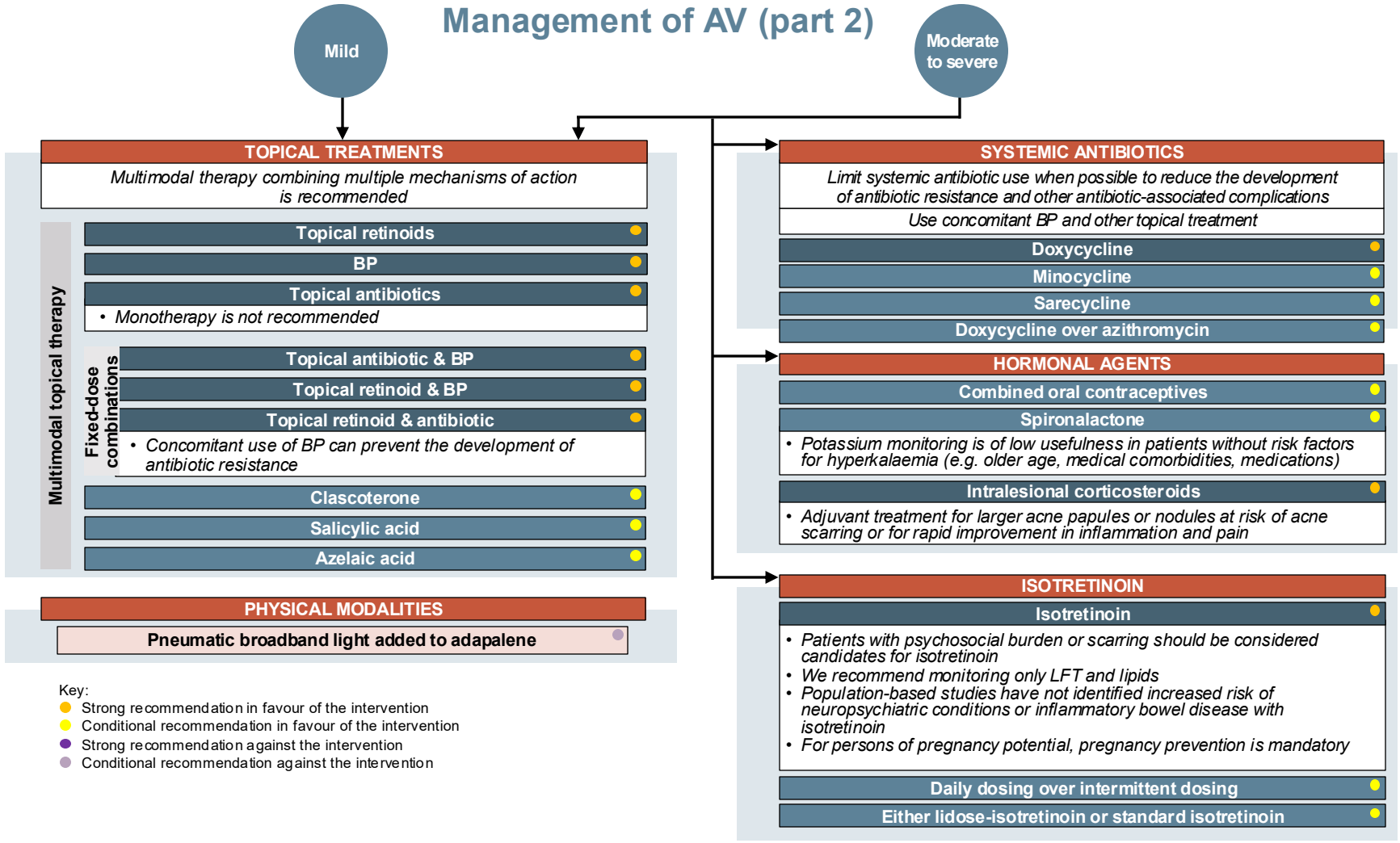


AAD, American Academy of Dermatology; AV, acne vulgaris; BPO, benzoyl peroxide; LFT, liver function test

1. Zaenglein AL, et al. J Am Acad Derm. 2016;74:945-73.e33; 2. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30

MANAGING ACNE VULGARIS: AAD GUIDELINES (2/2)

EVIDENCE-BASED RECOMMENDATIONS FOR MULTIMODAL TREATMENT

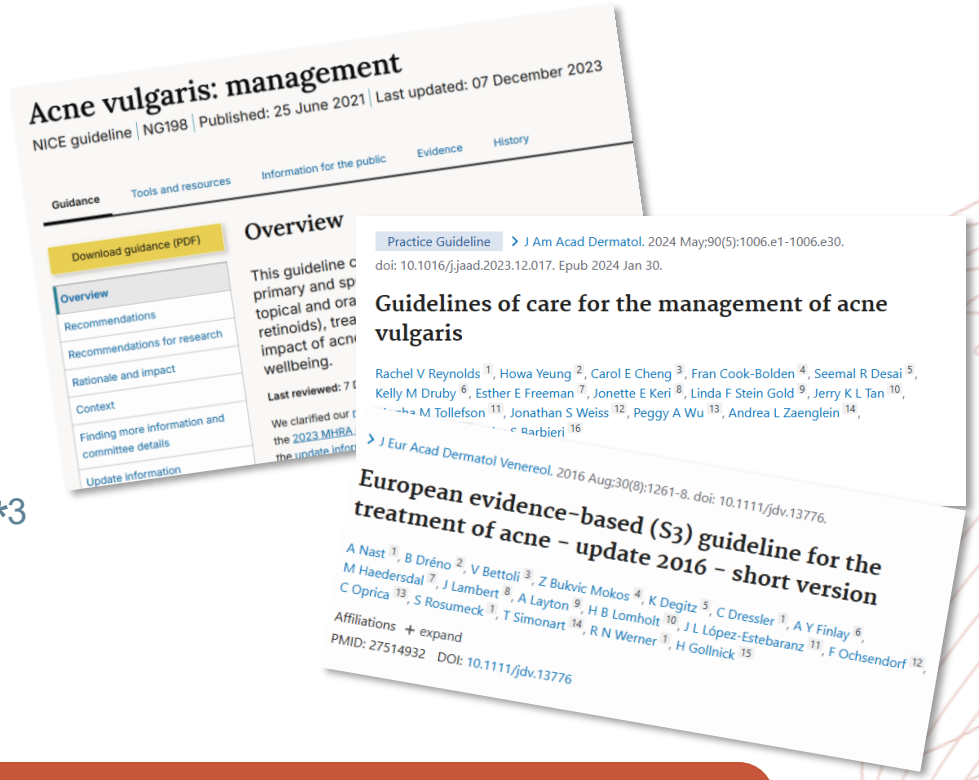


AAD, American Academy of Dermatology; AV, acne vulgaris; BP, benzoyl peroxide; LFT, liver function test;

Reynolds RV, et al. J Am Acad Dermatol. 2024 May;90(5):1006.e1-1006.e30

MANAGING ACNE VULGARIS: GUIDELINES
FURTHER READING

- NICE management guideline for acne vulgaris[1]
  - Click HERE
- AAD guidelines of care for the management of acne vulgaris[2]
  - Click HERE
- European S3 guideline for the treatment of acne*[3]
  - Click HERE



These guidelines may require **updates** as **new insights and evolving treatment options** continue to shape the acne vulgaris management landscape, especially as part of combination therapies with longer-known treatments

AAD, American Academy of Dermatology; NICE, National Institute for Health and Care Excellence

*Currently being updated (June 2025)

1. National Institute for Health and Care Excellence. Acne vulgaris: management NICE guideline [NG198]. Available at: www.nice.org;

2. Reynolds RV, et al. J Am Acad Dermatol. 2024;90(5):1006.e1-1006.e30; 3. EDF. S3-Guideline for the Treatment of Acne (Update 2016). Available here (accessed May 2025)

CONCLUSIONS

CONCLUSIONS

IMPROVING ACNE VULGARIS WITH MULTIMODAL TREATMENT STRATEGIES

- **Acne vulgaris is a widespread and burdensome condition:** Optimal patient care requires recognising physical and psychological impacts
- **Pathophysiology-driven treatment selection is key:** Understanding the main pathogenic factors enables more effective and targeted management
- **Multimodal treatment approaches improve outcomes:** Combining therapies to address different pathogenic factors is the best practice for more rapid and better long-term success
- **Guidelines continue to evolve:** Stay updated on emerging therapies and changes in evidence-based recommendations
- **Future perspectives:** Further optimising the use of current and novel treatment options through multimodal treatment strategies to improve patient outcomes

REFLECT BRIEFLY

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