Female acne for non-dermatologists

A practical educational manual

The content has been developed by the Global AWARE (Appropriate Care for Women With Androgen Excess) Group, an independent panel of physicians with an expert interest in the treatment of androgen excess in women, formed in 2015. Formation of the AWARE group and the group's meetings are supported by Bayer AG.

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This manual is an interactive PDF. To correctly navigate from page to page, please use the arrows at the bottom of the page:

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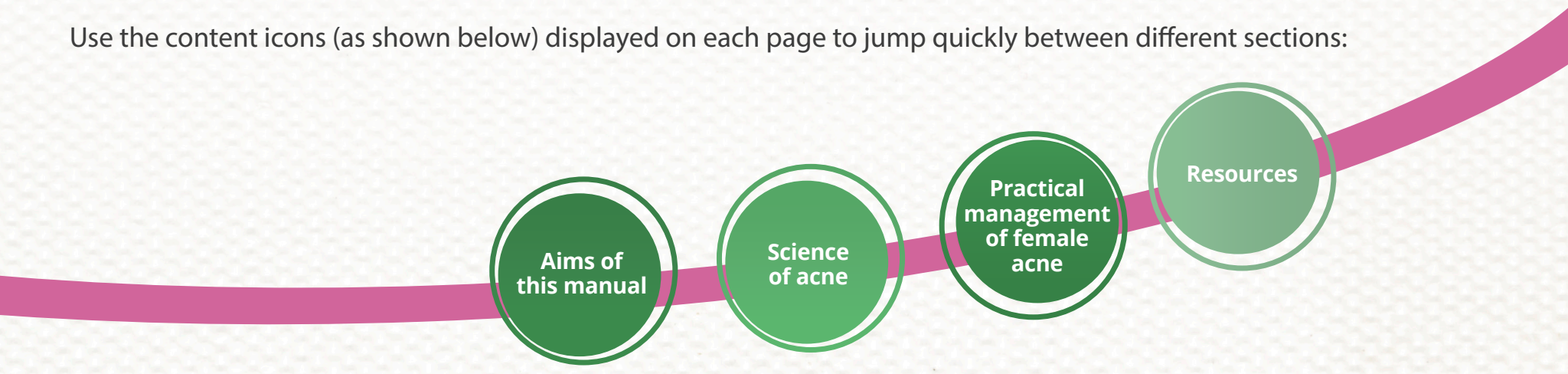

At any time, to return to the front home-page select the home icon:

In some places, further information can be viewed by clicking, for example. When a question mark is displayed, clicking it will open a box containing further information. Select the '**x**' to exit.

Is there scarring, nodules >5 mm or painful lesions?

Is there scarring, nodules > 5mm or painful lesions?

Clinical signs of acne include seborrhea (greasy skin), comedones, inflamed lesions or nodules accompanied by pain, tenderness or erythema and pigmentation but the severity of presentation varies.

Presence of nodules/nodular acne and/or scarring should always prompt referral to a dermatologist.

The 'Resources' section contains links to useful further information and resources available:

Resource	Source
Dermatology Quality of Life Index (DLQI)	Finlay AK, Khan GK. Dermatology Life Quality Index (DLQI)—a simple practical measure for routine clinical use. Clin Exp Dermatol 1994;19(3):210–216

Aims of this manual

This manual aims to increase awareness of the role androgen excess plays in female acne, as well as enhance understanding and facilitate appropriate use of hormonal antiandrogens as an effective treatment. The global AWARE group is a panel of experts working to ensure that women with androgen excess receive appropriate care.

Women with acne may seek advice in general medical practice or when consulting their gynecologist. The variable presentation and severity of acne can lead to complexity in differential diagnosis amongst non-dermatologists and potentially delay initiation of appropriate treatment.

This manual addresses gaps in knowledge and provides practical guidance to non-dermatologists, helping them to:

- Recognise the type of acne they can treat quickly and effectively
- Understand the role antiandrogens can play in treatment of female acne
- Identify situations where referral to a dermatologist is required

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Science of acne

The Facts

- Prevalence
- Impact
- Classification

Mechanisms of acne

- Pathophysiology
- Influencing factors

Distribution of acne caused by androgen excess

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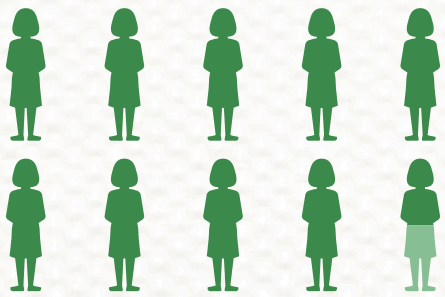
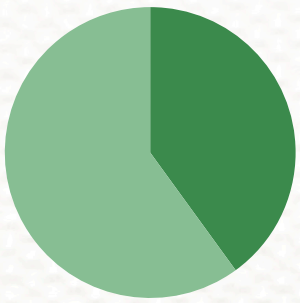
Science of acne

The Facts

Acne is an extremely common, chronic skin condition.[1]



Prevalence of acne peaks in the teenage years, affecting between 50% and 95% adolescents, depending on how it is assessed.[1]

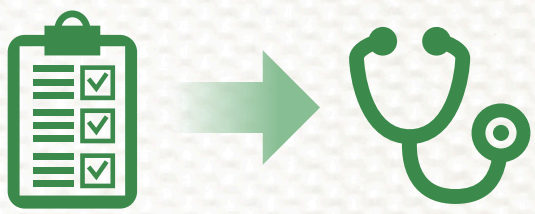


Acne peaks in adolescence but can persist into the mid-twenties and beyond in up to 40% of women.[2,3]

Acne may also be late in onset, occurring for the first time in women well after puberty (usually between 21 and 25 years of age).[3,4]

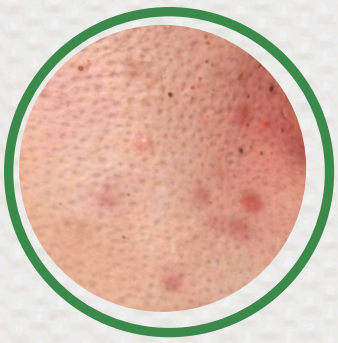
Acne has a significant impact on quality of life.[5-7]

Almost one in five women affected by acne may also experience depression and more than 40% report anxiety.[8]



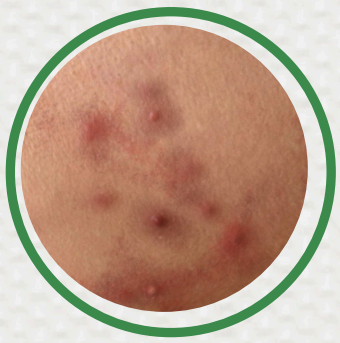
Psychosocial impact may not always correlate with disease severity but it may influence treatment decisions,[9] for example, the need to refer.

Comedonal acne



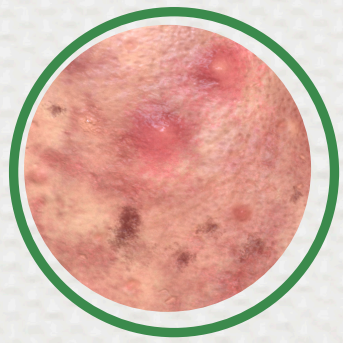
Presence of open (blackheads) and closed comedones (whiteheads).

Papulo-pustular acne



Presence of non-inflammatory and inflammatory lesions that may be either superficial (papules and pustules ≤5 mm in diameter) or develop into deep pustules or nodules in more severe disease.

Nodular acne



Presence of small nodules (firm, inflamed lesions >5 mm diameter) that are painful by palpation. Large nodules (>1 cm diameter) may extend over large areas and can result in painful lesions, exudative sinus tracts and tissue destruction.

Please note: *Presence of nodules/ nodular acne should **always** be referred to a dermatologist.*

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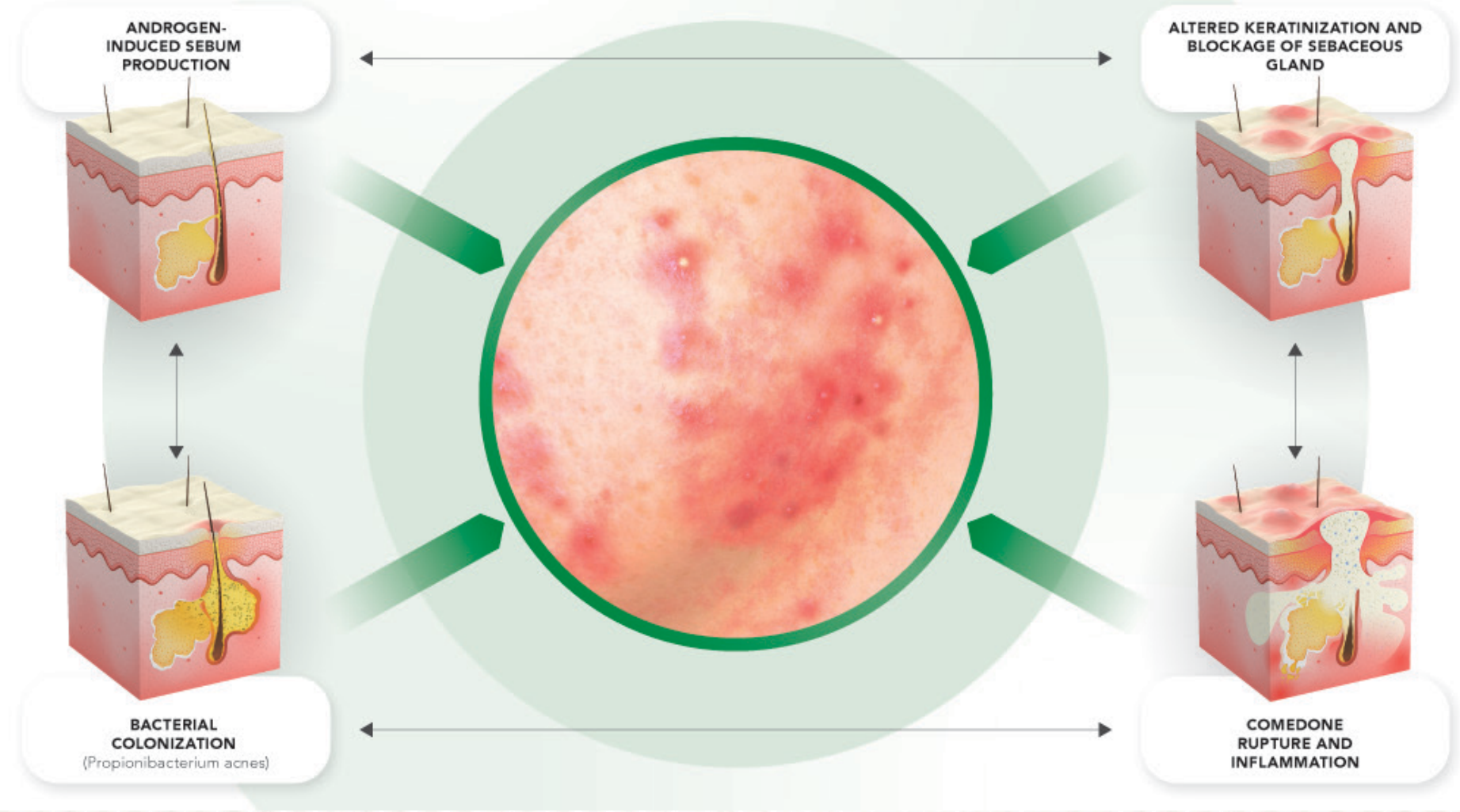
Mechanisms of acne

Androgens play an important role in the pathophysiological processes leading to acne, affecting the hair follicles and the accompanying sebaceous glands (pilosebaceous unit).[10]



In women, the development of acne is influenced by both hormonal and non-hormonal factors[11-15]

Hormonal influences

- Menstrual cycle
- Pregnancy (+/- effect)
- Polycystic ovary syndrome (PCOS)
- Androgen excess (affects 10-20% of women)
- Hormone treatment, e.g. oral contraceptives

Non-hormonal influences

- Genetic predisposition
- Medication use (e.g. iodine, lithium, isoniazid, phenytoin, cyclosporine)
- Cosmetics (e.g. oil- or cocoa butter-containing products)
- Competitive sport
- Lifestyle aspects (e.g. smoking or diet, the latter possibly related to consumption of dairy products or foods with a high glycemic index)
- Pressure or friction on the skin (e.g. bike helmet straps)

Science of acne

Distribution of acne caused by androgen excess

Acne mostly affects the face but, in some cases, it can extend to other areas of the body where there is a dense population of sebaceous follicles, such as the upper chest and back.[11-13]

Acne caused by hormonal imbalances, such as raised androgen levels in women with androgen excess, predominantly presents on the sides of the jaw and chin as shown in the image below.[14] Acne distribution may therefore be helpful in identifying androgen-related acne and help guide appropriate treatment.

Practical management of female acne

Acne treatment overview

- Goals of therapy
- The European Academy of Dermatology and Venereology guidelines

Diagnosing female acne and treatment options

The following topics are merged into a single diagnostic and treatment algorithm:

- When to refer
- Evaluating the need for treatment escalation or maintenance therapy
- Treatment options
- Further investigation for PCOS
- Initiating hormonal treatment, or considering switching to a more antiandrogenic hormonal treatment
- Managing expectations
- Contraindications

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Acne treatment overview

The goals of acne therapy include:

controlling the development of acne lesions

preventing scarring

minimizing morbidity, including improving quality of life

Therapeutic interventions are therefore targeted towards the multiple pathogenic factors: excess sebum, follicular hyperprofileration, microcomedone formation, P. acnes colonization and inflammation.

Multiple treatment options exist and a suitable regimen for reducing lesions can be found for most patients.[1,16]

For further information see the guidelines published by The European Academy of Dermatology and Venereology.[1]

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Antiandrogenic hormonal treatments

Hormonal antiandrogenic therapies can be used in combination with estrogen to treat acne which has been identified as being caused by androgen excess. These therapies are indicated in:

- Women affected by late onset (or post-pubertal) acne or when oral contraception is desirable
- Women requiring an alternative option where repeated courses of isotretinoin are needed
- Women whose acne is not responding to topical or other systemic therapy, or in women with diagnosed PCOS[14]
- Women where there are clinical signs of biochemical hyperandrogenism (seborrhea, acne, or hirsutism) or proven ovarian or adrenal hyperandrogenism

Ethinylestradiol (EE) and progestogen combinations

EE in combination with progestogens with antiandrogenic potential (cyproterone acetate [CPA], chlormadinone acetate [CMA], dienogest [DNG], or drospirenone [DRSP]) are all treatment options for women with moderate to severe acne.[10,17]

EE opposes androgens at a local level and regulates sebum production and sebaceous gland growth. It decreases ovarian production of testosterone and increases levels of sex hormone binding globulin that binds serum testosterone. This therefore decreases the amount of free testosterone available to bind with the androgen receptor.[18]

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Different combinations of EE/progestogen have varied antiandrogenic potential

The combination of CPA/EE has the greatest antiandrogen potential of hormonal treatments containing a combination of progestogens and EE.[19,20]

Decreasing antiandrogenic effect[21]

Progestogen	Mode of action	In combination with EE
CPA - cyproterone acetate	Inhibits the activity of 5-alpha-reductase[22] and androgen synthesis in the skin and decreases androgen blood concentration through an antigonadotrophic effect.[23]*	Available in combination with EE for the treatment of acne when alternative treatments, such as topical therapy and antibiotic treatment, have failed.[23]* CPA/EE has the greatest antiandrogenic potential.[10,21] As CPA/EE acts as a hormonal contraceptive, women should not take it in combination with other hormonal contraceptives as concomitant use with another hormonal contraceptive will expose women to a higher dose of estrogen and increased risk of thromboembolism.[23]*
CMA - chlormadinone acetate	Inhibits the activity of 5-alpha-reductase in the skin and reduces ovarian and adrenal androgen production via its antigonadotrophic effect.	Available in combination with EE as a combined oral contraceptive.
DNG - dienogest	Possesses strong progestational effects and moderate antiandrogenic and antigonadotrophic effects.	Available in combination with EE as a combined oral contraceptive.
DRSP - drospirenone	Blocks ovarian steroid production, reduces adrenal androgen synthesis and blocks peripheral androgen receptors in the skin.	Available in combination with EE as a combined oral contraceptive.

*Please see national approval documentation for Diane-35 for specific license indications in your country

The following page outlines a useful step-by-step algorithm to help healthcare professionals identify acne which could benefit from this treatment approach.

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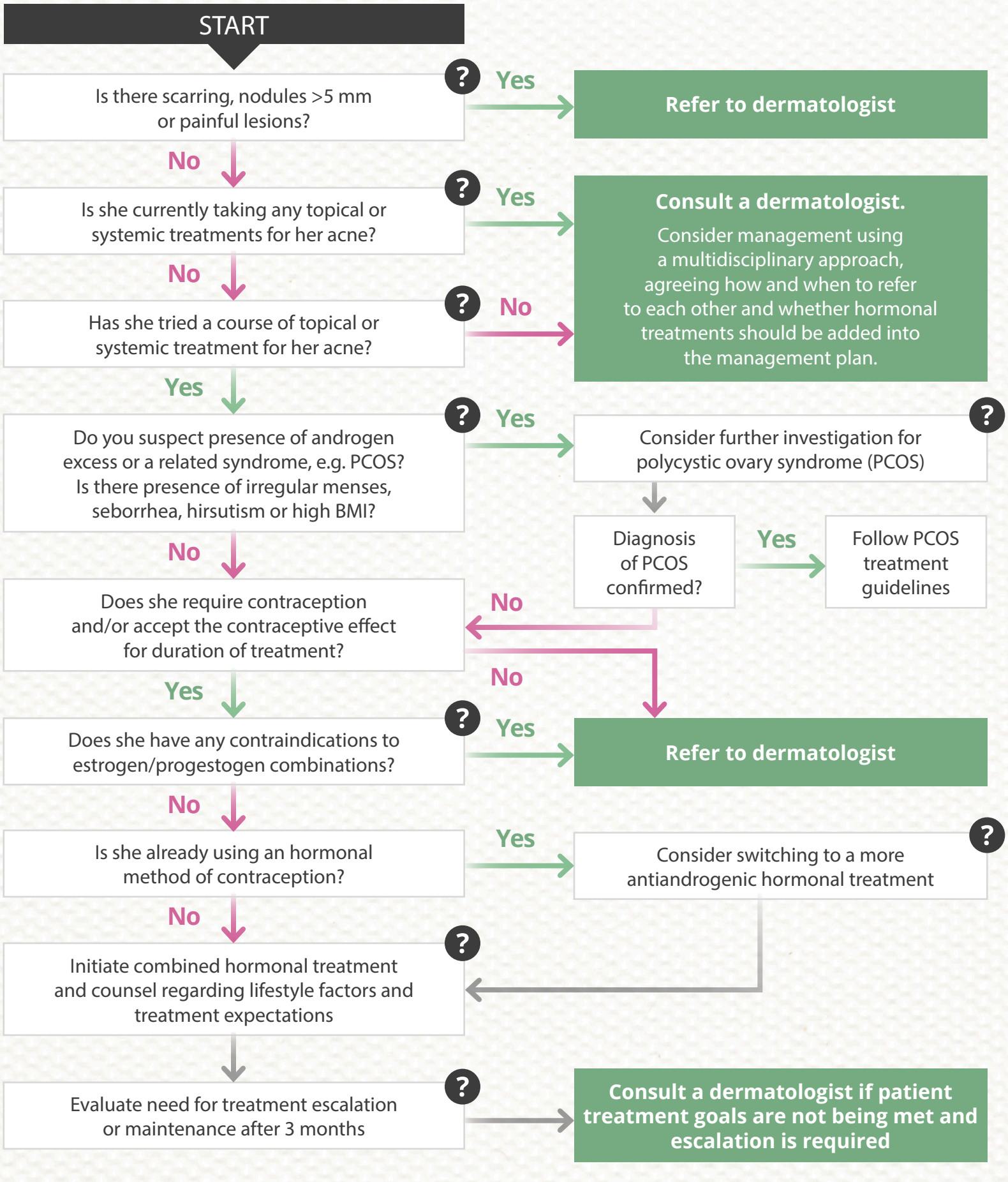
Diagnosing female acne suitable for treatment with hormones

This algorithm for non-dermatologists aims to clarify the role of antiandrogens in the treatment of women with acne.



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Diagnosing female acne suitable for treatment with hormones

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Does she have any contraindications to estrogen/progestogen combinations?

Yes → Refer to dermatologist

No

Is she already using an hormonal method of contraception?

Yes → Consider switching to a more antiandrogenic hormonal treatment

No

Initiate combined hormonal treatment and counsel regarding lifestyle factors and treatment expectations

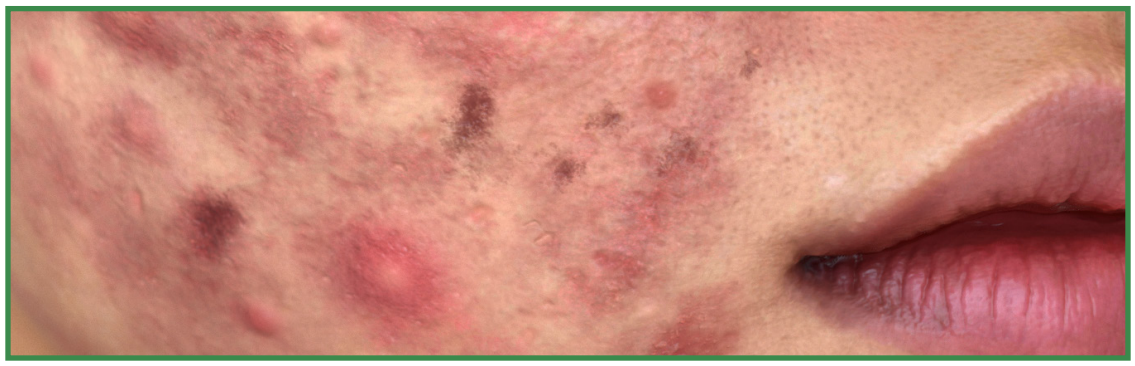
Evaluate need for treatment escalation or maintenance after 3 months

Consult a dermatologist if patient treatment goals are not being met and escalation is required

Is there scarring, nodules > 5 mm or painful lesions?

Clinical signs of acne include seborrhea (greasy skin), comedones, inflamed lesions or nodules accompanied by pain, tenderness or erythema and pigmentation but the severity of presentation varies.

Presence of nodules/nodular acne and/or scarring should always prompt referral to a dermatologist.



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Is she currently taking or has she tried any topical or systemic treatments for her acne?

In general, topical treatments either alone or in combination with benzoyl peroxide (BPO) or antibiotics are usually first choice for comedonal and papulo-pustular acne.[14]

Topical treatments	Topical retinoids, such as isotretinoin or adapalene: normalize follicular hyperproliferation and hyperkeratinization and reduce the development of comedones and inflammatory lesions. Azelaic acid: a natural dicarboxylic acid with an antibacterial and anti-hyperkeratinization effect. Benzoyl peroxide (BPO): possesses bactericidal, anti-inflammatory and anti-hyperkeratinization properties.
Topical antibiotics	Topical antibiotics (commonly tetracyclines such as clindamycin): address the hyperproliferation of *P. acnes* and have a direct anti-inflammatory action.
Systemic antibiotics	Systemic antibiotics (commonly tetracyclines such as doxocycline or minocycline) address the hyperproliferation of *P. acnes* and exert a direct anti-inflammatory action. They are useful if acne is occurring in multiple sites such as the face and trunk.
Combination therapy	Fixed combinations of adapalene plus BPO or BPO and clindamycin can work synergistically with each other or with systemic treatments. Benefits include acceleration of treatment response, as well as reduction in the duration of antibiotic use and limited potential for development of antibiotic resistance.

Initiate combined hormonal treatment and counsel regarding lifestyle factors and treatment expectations

Evaluate need for treatment escalation or maintenance after 3 months

Consult a dermatologist if patient treatment goals are not being met and escalation is required

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Diagnosing female acne suitable for treatment with

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Do you suspect presence of androgen excess or a related syndrome, e.g. PCOS?

Is there presence of irregular menses, seborrhea, hirsutism, high BMI or high waist-to-hip ratio?

Age-related changes	Hormonal triggers of acne vary throughout a woman's lifespan. Hormone changes such as pregnancy and the menopause can improve acne in some women but for others, their acne may worsen at this time.[24]
Menstrual cycle irregularities	The co-existence of menstrual disturbances such as oligomenorrhea, amenorrhea and prolonged erratic menstrual bleeding alongside acne, particularly in adult women, could indicate the presence of polycystic ovary syndrome (PCOS). Acne affects approximately 30% of women with PCOS.[15]
Other potential signs of androgen excess	Presence of acne can indicate elevated levels of circulating androgens (biochemical hyperandrogenism) or increased sensitivity of the pilosebaceous unit to normal levels of circulating androgens (clinical hyperandrogenism).[25] Other clinical symptoms include seborrhoea and hirsutism.[26] These symptoms can be idiopathic, ovarian, or adrenal in origin. As elevated circulating androgen levels are not always present, assessing systemic androgen levels is only one part of clinical diagnosis and, as a result, the presence of clinical hyperandrogenism can frequently be dismissed. The pathophysiology of PCOS is complex and women may also present with signs of metabolic dysfunction. Risk factors for the development of symptomatic PCOS include obesity (and/or history of weight gain).[15]

and counsel regarding lifestyle factors and treatment expectations

Evaluate need for treatment escalation or maintenance after 3 months

?

Consult a dermatologist if patient treatment goals are not being met and escalation is required

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Consider further investigation for polycystic ovary syndrome (PCOS)[18,27,28]

After exclusion of other androgen excess or related disorders, The Rotterdam criteria defines PCOS by the presence of two of the following:

- Clinical or bio-chemical hyperandrogenism
- Irregular menses
- Polycystic ovary morphology, after excluding other endocrine causes such as hyperprolactinemia

Please note: Use of these laboratory tests will be guided by local protocols and/or cost constraints according to clinical practice and availability.

• Ultrasound	To confirm PCOS NB absence of ovarian morphology does not exclude diagnosis
• Serum 17-hydroxyprogesterone (OHP) • 24h urinary free cortisol • DHEA-S	To exclude other hyperandrogenic conditions e.g. • Thyroid disease • Non-classical congenital adrenal hyperplasia • Adrenal or ovarian tumors • Acromegaly • Cushing syndrome and late-onset androgenital syndrome (AGS)
• Serum or urine human chorionic gonadotrophin (HCG)	To evaluate amenorrhea and exclude pregnancy
• Anti-Mullerian hormone (AMH) 4h urinary free cortisol • Sex hormone binding globulin (SHBG) • Serum free IGF-1	Other tests which may be helpful e.g. AMH has an emerging role in predicting Ovarian Hyperstimulation Syndrome (OHSS) in IVF cycles or to consider the presence of granulose cell tumors

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Does the patient have any contraindications to COCs and combined hormonal antiandrogen treatment?[14,29]

Patients must be carefully screened before using any estrogen/progestogen combinations for acne for potential contraindications, which include:

- Presence or a history of venous or arterial thrombotic/thromboembolic events (e.g. deep venous thrombosis, pulmonary embolism, myocardial infarction) or of a cerebrovascular accident
- Presence or history of prodromi of a thrombosis (e.g. transient ischaemic attack, angina pectoris)
- History of migraine with focal neurological symptoms
- Diabetes mellitus with vascular involvement
- Known or suspected sex-steroid influenced malignancies (e.g. of the genital organs or the breasts)
- Severe hepatic disease or tumour
- Known or suspected pregnancy
- Lactation
- Abnormal uterine bleeding (without diagnosis)

For further guidance on contraindications when prescribing combined hormonal treatment, refer to the World Health Organization Medical eligibility criteria for contraceptive use.

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Initiate hormonal treatment or consider switching to a more antiandrogenic hormonal treatment

Hormonal therapies are indicated in women affected by late onset (or post-pubertal) acne or when oral contraception is desirable. They are also an alternative option where repeated courses of isotretinoin are needed, in women whose acne is not responding to topical or other systemic therapy, or in women with PCOS. Hormonal therapies are also indicated in women where there are clinical signs of hyperandrogensim (seborrhea, acne, or hirsutism) or proven ovarian or adrenal hyperandrogenism.

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EE opposes androgens at local level and regulates sebum production and sebaceous gland growth, decreases ovarian production of the testosterone and increases levels of sex hormone binding globulin that binds serum testosterone and so decreases the amount of free testosterone available to bind with the androgen receptor.[18]

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Is there scar
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Is she already using an hormonal
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Evaluate need for treatment escalation or maintenance after 3 months

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Consult a dermatologist if patient treatment goals are not being met and escalation is required

Evaluate need for treatment escalation or maintenance therapy

Acne has a tendency to recur therefore maintenance therapy to suppress microcomedone development is recommended.[14] It is important to consider the efficacy and tolerability of treatment options as well as adherence to treatment when reviewing options for maintenance therapy.

Lack of adherence is an important cause of treatment failure but it can be minimized by enhancing patient knowledge of:[1]

- ✓ Mode of action
- ✓ Regimen details
- ✓ Duration of treatment
- ✓ Expected time before first visible benefit seen
- ✓ Potential side effects

As the majority of therapeutic interventions work by preventing the development of new acne lesions rather than treating new ones, it is useful for patients to understand how long it will take to see a positive effect and therefore the likely duration of treatment. Detailed summary of mode of actions and time to effect can be found in Resources.

Resources

Further information

- HCP FAQs
- Patient FAQs
- Summary of treatments and time to effect
- Other useful resources

References

- List of citations

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HCP frequently asked questions about acne

1

Is family history important for the development of acne?

A family history increases the risk of developing acne and also influences the timing of onset and severity.[1,30] If both parents had acne, there is a greater likelihood of developing severe acne at an early age. [1,30]

2

Can acne change to a malignant skin disease?

Although acne is unrelated to skin cancer, the perceived benefits of sun exposure, i.e. to darken the skin to hide blemishes or to make it feel drier, are only temporary and excessive sun exposure can lead to increased risk of developing malignant skin disease.[31]

3

Is acne possible in perimenopausal women? How should I treat this type of acne?

Acne is possible in older women. Unlike persistent, adolescent acne, which sometimes continues into adulthood, this 'late onset acne' first presents in adult women and is associated with a substantial negative psychological, social and emotional impact.[14] Adult acne is generally mild-to-moderate in severity and may sometimes be refractory to treatment.[14] Referral to a dermatologist is recommended.

4

Does acne present differently in different age groups?

Acne presents differently in adolescents and adult women.[4] In the former, acne presents as numerous comedonal and inflammatory lesions, usually in the T-zone i.e. the forehead, nose and ears.[4] However in adult women, acne mostly presents as inflammatory lesions (particularly papules, pustules and nodules), typically located on the chin, jawline and neck.[4]

5

How do I manage a patient whose complaints about her skin do not correspond to objective findings, for example, if she has body dysmorphic disorder?

The psychosocial impact of acne may not always correlate with disease severity but it may influence treatment decisions and referral to a dermatologist would be recommended.[9]

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HCP frequently asked questions about treatment of acne

1 **What happens if the acne worsens after starting hormonal acne treatment?**

Some hormonal treatments, for example, progestogen-only pills or the contraceptive patch, can make acne worse.[32] It may be worth switching to an alternative hormonal treatment that possesses a greater antiandrogenic potential.[32]

2 **What happens if a patient develops acne after having an implant or LNG-IUS inserted?**

If a patient does not want to change her method of contraception but would like treatment for the acne, she should be referred to a dermatologist to discuss non-hormonal topical or systemic treatment options.

3 **How long should I continue treatment after resolution of acne?**

Acne has a tendency to recur therefore maintenance therapy to suppress microcomedone development is recommended. It is important to consider the efficacy and tolerability of treatment options as well as adherence to treatment when reviewing options for maintenance therapy.

4 **If treatment is unsuccessful with a COC, can I switch to a different COC?**

The antiandrogenic potential of combined oral contraceptives (COC) differs according to the type of progestin it contains.[32] Options combining estrogen and antiandrogenic progestogens such as cyproterone acetate possess the greatest antiandrogenic potential.[10,21]

5 **Is it possible to use COC in extended cycles in the treatment of acne?**

Although it may be possible to use an extended cycle COC to help in the resolution of acne, such preparations have the highest incidence of breakthrough bleeding.[5]

The antiandrogenic potential of combined oral contraceptives differs according to the type of progestin it contains.[32] Options combining estrogen and antiandrogenic progestogens such as cyproterone acetate possess the greatest antiandrogenic potential.[10,21]

Resources

Frequently asked questions from patients

1 How quickly can I expect to a see a difference in my acne?

It can take two to three months before you see a difference in your skin, but treatment may need to continue for several months for maximum effect.[33]

2 How will acne treatment affect my fertility?

Hormonal treatments (combined oral contraceptives and hormonal antiandrogenic therapy) will prevent pregnancy due to their contraceptive effect. However, cessation of treatment generally leads to a prompt return to fertility.[34] A stop-start approach to use of hormonal treatments is not recommended due to the increased risk of VTE.[35]

Some oral and topical medications, such as retinoids and clindamycin, are not suitable treatment options if you are trying to conceive therefore you may be offered alternative therapies.

3 Can I still get pregnant after using hormonal treatment for my acne?

There should be no delay in return to fertility after discontinuation of hormonal treatments (combined oral contraceptives and hormonal antiandrogenic therapy) used in the treatment of acne.[34]

4 Do I need to use contraception whilst my acne is being treated?

The need to use contraception whilst your acne is being treated depends on the treatment provided. Hormonal antiandrogenic therapy, such as CPA/EE, acts as a contraceptive. It should not be taken in combination with other hormonal contraceptives as this increases exposure to a higher dose of estrogen and increased risk of thromboembolism.[34*] Contraception is required when being treated with isotretinoin as the treatment can cause damage to a developing fetus.[36] As part of a European directive aimed at minimizing the risk of adverse effects during treatment with isotretinoin, a pregnancy prevention programme has been introduced which involves mandatory medically supervised pregnancy testing before, during and 5 weeks after a course of isotretinoin and provision of advice on contraception by clinicians.

5 What if I don't want to use a treatment for acne that is also a contraceptive?

Suitable options for consideration include topical therapy with BPO, azealic acid, erythromycin and chemical peels, or lasers and phototherapy.

*Please see national approval documentation for Diane-35 for specific license indication in your country

Resources

Resource	Source
European evidence-based guidelines for the treatment of acne.	Nast A, et al. European evidence-based (S3) guidelines for the treatment of acne. J Eur Acad Dermatol Venereol 2012;26(Suppl 1): 1–29
Guidance on contraindications when prescribing combined hormonal treatment	World Health Organization. Medical eligibility criteria for contraceptive use. 5th ed. Geneva: WHO; 2015
Dermatology Quality of Life Index (DLQI)	Finlay AK, Khan GK. Dermatology Life Quality Index (DLQI)—a simple practical measure for routine clinical use. Clin Exp Dermatol 1994;19(3):210–216
Specific acne measures:	
Acne Disability Index (ADI)	Motley RJ, Finlay AY. How much disability is caused by acne? Clin Exp Dermatol 1989;14:194-198
Cardiff Acne Disability Index (CADI)	Motley RJ, Finlay AY. Practical use of a disability index in the routine management of acne. Clin Exp Dermatol 1992;17:1-3
Acne-Specific Quality of Life (Acne-QOL) questionnaire	Girman CJ, et al. Evaluating health-related quality of life in patients with facial acne: development of a self-administered questionnaire for clinical trials. Qual Life Res 1996;5(5)481-90
Acne-QOL	Tan J, et al. Condensation and validation of a 4-item index of the Acne-QoL. Qual Life Res 2006;15(7):1203-10

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Resources

Managing patient expectations around duration of treatment and time to treatment effect

Treatment	Mode of action	Duration of treatment	Expected time before first visible benefit seen	Potential side effects (most common)
Topical retinoids	Normalize follicular hyperproliferation and hyperkeratinization and reduce the development of comedones and inflammatory lesions	Minimum 6 weeks[33]	Usually at least 6 weeks[33]	Mild irritation and stinging of the skin[33]
Topical antibiotics	Address the hyperproliferation of *P. acnes* and have a direct anti-inflammatory action	6 to 8 weeks[33]	Usually at least 6 weeks[33]	Minor irritation of the skin including redness and burning and/or peeling[33]
Systemic antibiotics	Address the hyperproliferation of *P. acnes* and exert a direct anti-inflammatory action, useful if acne is occurring in multiple sites such as the face and trunk	4 to 6 months[33]	Usually at least 6 weeks[33]	Increases skin sensitivity to sunlight and UV light, and reduction in the effectiveness of the oral contraceptive pill duringo the first few weeks of treatment[31]
Combination treatments	Fixed combinations of adapalene plus BPO or BPO and clindamycin can work synergistically with each other or with systemic treatments to accelerate treatment response, as well as reduce the duration of antibiotic use and limit the potential for development of antibiotic resistance	Minimum 6 weeks (but depends on combination approach used)[33]	Usually at least 6 weeks (but depends on combination approach used)[33]	See above for side effects of constituent treatments
Combined oral contraceptives	Suppress androgen production by the ovaries. Some preparations may also reduce adrenal androgen synthesis and block peripheral androgen receptors in the skin	Up to a year[33]	Up to a year[33]	Amenorrhea, breakthrough bleeding, breast tenderness, decreased libido, headache, heavy menses[37]
Hormonal antiandrogenic treatments	Antiandrogenic progestogens such as CPA inhibit androgen synthesis in the skin and decrease androgen blood concentration through an antigonadotrophic effect[23*]	Minimum 3 months (the need to continue treatment should be periodically assessed by the treating physician)[23]	With CPA/EE, signs of improvement seen at 3 months[26] Healing or improvements in the face, chest and back are seen in >88% of patients at 12 months[38]	Nausea, abdominal pain, depressed/ altered mood, headache, breast pain/tenderness, increased weight[23*]

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Resources

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Aims of this manual
Science of acne
Practical management of female acne
Resources