

Acne

	Mild (Comedonal or Inflammatory/Mixed Lesions)	Moderate (Comedonal or Inflammatory/Mixed Lesions)	Severe (Inflammatory/Mixed and/or Nodular Lesions)
Education	Past treatment; active scarring; psychological effects; treatment cost; vehicle selection; ease of use; side effects; regimen complexity should be considered Set realistic expectations <ul style="list-style-type: none"> • Topical therapies typically take 6-8 weeks to start seeing results Review proper application of topical therapies <ul style="list-style-type: none"> • Apply a pea-sized amount to the entire face, distributing it several spots and spreading and rubbing it in completely • If it leaves a film, probably too much was applied Discuss expected side-effects <ul style="list-style-type: none"> • Redness, drying and irritation are typical • Patients should use a moisturizing sunscreen 		
Initial treatment	Topical Benzoyl peroxide (BP) or Topical Retinoid or Topical Azelaic acid or Topical combination therapy ^a	Topical combination therapy ^a or Topical combination therapy + oral antibiotic or Topical combination therapy + oral hormonal therapy ^d or Topical combination therapy + oral antibiotic + oral hormonal therapy ^d	Topical combination ^a therapy + oral antibiotic or Topical combination therapy + oral antibiotic + oral hormonal therapy ^d or Topical combination therapy + oral hormonal therapy ^d or Oral isotretinoin
Inadequate response (ASSESS ADHERENCE!)	Add BP or retinoid, if not already prescribed or Change topical medications ^b or Consider alternative topical therapies <ul style="list-style-type: none"> • Dapsone • Clascoterone^c • Salicylic acid • Sulfacetamide sulfur 	Change topical medications ^b or Add or change oral antibiotic or hormonal therapy ^d or Consider isotretinoin	Add or change oral antibiotic or hormonal therapy ^d or Consider isotretinoin

^aTopical combination therapy includes retinoid + benzoyl peroxide, retinoid + benzoyl peroxide + topical antibiotic, or benzoyl peroxide + topical antibiotic. Topical antibiotics should not be used without concurrent benzoyl peroxide given risk of developing antibiotic resistance.

^bChange topical medication indicates changing the topical antibiotic or retinoid type, concentration, formulation, or changing the combination of topical agents.

^cPrescribed only to patients aged 12 years or older. Oral antibiotics should not be used without concurrent benzoyl peroxide given risk of developing antibiotic resistance.

^dPrescribed only to female patients (combined oral contraceptive pill (COC) FDA approved for acne: norgestimate/ethinyl estradiol, norethindrone/ethinyl estradiol, drospirenone/ethinyl estradiol (+/-levomefolate); or spironolactone).

Clinical Guidelines: Acne

GOAL: Pediatricians should initiate treatment for cases of “Mild” to “Severe” acne (see algorithms attached). Pediatricians should also counsel patients in order to maximize adherence to acne treatment regimens:

1. Realistic expectations.

Patients should be counseled that topical therapies typically take up to 6-8 weeks of at least 5 times weekly use to start seeing results. This is an unavoidable fact based on how long it takes “for the skin to grow out” to reveal the effects of the treatment regimen. In addition, some patients may appear to “worsen” initially before improvement is noted; this is most typically experienced with topical retinoids and is evident around 2 weeks after starting treatment.

PEARL: Ask patients how long *they* think it will take to see improvement and then establish reasonable expectations from the start!

2. Proper application of topical therapies.

Topical acne therapies are designed to be used as “field therapy,” meaning the entire face needs to be treated. “Spot-treatment” of individual acne lesions is neither advised nor effective. Instead, patients should be instructed to use a “pea-sized” amount of topical medication for the entire face. To help evenly disperse the medication over the entire face, several small dollops can be applied to each cheek, forehead, chin and nose, and then the medication should be gently massaged into the entire face. In this case, “less is more.” If patients apply their medications and see a film of medication on their faces, then they probably applied too much, putting them at risk for developing excessive side effects without additional treatment gain.

PEARL: Have patients demonstrate in-office how they actually apply their medications; the variation will be an educational experience for both patients and caregivers alike!

3. Anticipation of expected side effects.

Patients should be forewarned that most forms of topical therapy (especially benzoyl peroxide and retinoids) may lead to redness, drying and irritation that may be confused with “worsening” acne; this typically presents within 2 weeks after initiation of therapy and is an expected part of the treatment regimen. Rarely, some sensitive skin patients may not be able to tolerate topical therapies on a daily basis; this is seen especially with benzoyl peroxide. The vast majority of patients, however, will find that they can avoid excessive irritation by starting to apply their topical medications “every other day” or even “every other-other day,” increasing to “daily” as tolerated. To combat irritation, all patients should be encouraged to utilize skin moisturizers and sun protection while on therapy. Moisturizers should, specifically, be “non-comedogenic” (i.e., will not clog pores or worsen acne), and sunscreens should be at least SPF 30.

PEARL: Sunscreen/moisturizer “combination” products – e.g., Neutrogena Daily Defense SPF 50; Cetaphil Daily Facial Moisturizer SPF 50+, and CeraVe AM Facial Moisturizing Lotion SPF 30 – are particularly helpful options for busy teenagers!

CONSIDER REFERRAL TO PEDIATRIC DERMATOLOGY:

- Lack of satisfactory response to treatment after 8 to 12 weeks
- Scar-inducing cysts or nodules present or scarring is actively occurring despite treatment
- Isotretinoin or spironolactone is being considered as treatment; **however, the final decision on use of isotretinoin/spironolactone will be left to the dermatologist, and patients should not be sent in expecting to be placed on isotretinoin or spironolactone**
- Child less than 9 years old

CONSIDER REFERRAL TO ENDOCRINOLOGY:

- Signs of hirsutism (e.g. excessive hair), alopecia, acanthosis nigricans present or menstrual irregularities accompany acne

Treatments for Acne Vulgaris and Helpful Notes

(Recommended starting medications are highlighted in gray.)

Topical Treatments	Dose/Formulation	Adverse Effects	Predominant Type of Acne (Comedonal, Inflammatory, Both)	Pregnancy/Lactation Recommendations	Additional Notes
Retinoids					
Adapalene	0.1% or 0.3% gel or cream nightly	Erythema (2.4 – 13%), dryness (1.3 -18%), burning/stinging (5.8-18%), sunburn (1.2 -2%), allergic contact dermatitis (reported)	Comedonal > Inflammatory	Risk of fetal harm not expected based on limited human data and insignificant systemic absorption. May use when breastfeeding	0.1% gel: only topical retinoid FDA approved for over-the-counter use. Least irritating of retinoids. Insurance may not cover without first failing tretinoin 0.025% cream.
Tretinoin	0.025%, 0.05%, or 0.1% cream or gel nightly, 0.04%, 0.08% or 0.1% microgel nightly; 0.05% lotion nightly	Erythema (4.1 – 50%), dryness (4.4 – 50%), burning/stinging (3.4 – 50%), sunburn (0.3 – 1%), allergic contact dermatitis (reported)	Comedonal > Inflammatory	Consider avoiding use especially in 1 st trimester; risk of teratogenicity low based on limited human data and minimal systemic absorption. May use when breastfeeding	Most likely to be covered by insurance. Start with lowest concentration and work up as tolerated. Generic tretinoin is photo-inactivated and must be used in the evening. Generic tretinoin may be inactivated by benzoyl peroxide and should be used in the evening.
Tazarotene	0.05% or 0.1% cream, gel or foam nightly, 0.045% lotion	Erythema (1.3 – 30%), dryness 1.4 – 30%),burning/ stinging (1.4 – 30%), allergic contact dermatitis (reported)	Comedonal > Inflammatory	Use alternative during pregnancy. Avoid use on nipple while breastfeeding, otherwise may use on other areas.	Most potent but also most irritating of the retinoids Insurance may not cover without first failing tretinoin 0.025% cream Pregnancy Class X medication

Trifarotene	0.005% cream nightly	Erythema (8 -11%), dryness (7.5-12%), burning/stinging (5-8.7%, sunburn (reported), allergic contact dermatitis (reported)	Comedonal > Inflammatory	Consider avoiding during pregnancy. Avoid use on nipple while breastfeeding, otherwise may use on other areas.	Only topical retinoid FDA approved for use on the chest and back New so may be difficult to get approved
Antibiotics					
Erythromycin	2% pad, gel or foam daily	Skin irritation (25%), allergic contact dermatitis (reported)	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding.	High rates of C. acnes resistance
Clindamycin	1% lotion, solution or gel once or twice daily	Skin irritation (7-23%), allergic contact dermatitis (reported)	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding.	
Minocycline	4% foam once daily	Skin irritation (5-15%), headache (3%), yellow sheen to skin (reported)	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding.	Can cause yellow discoloration of fabrics
Hormonal					
Clascoterone	1% cream twice daily;	Skin irritation (4.2 – 12.2%); HPA-axis suppression with large application (no clinical evidence of HPA-axis suppression observed in Phase II or III trials.) ¹¹³	Both	No available data	
Other					
Benzoyl Peroxide	2-10% wash, bar soap, gel, foam, lotion or cream once or twice daily	Erythema (14-30%), dryness (25 – 77%), burning/stinging (0-27%), allergic contact dermatitis (0.1-2.5%)	Both	May use during pregnancy. May use while breastfeeding.	Available over the counter. Can cause bleaching of fabrics.
<p>Additional Notes:</p> <ul style="list-style-type: none"> Many formulations of benzoyl peroxide are available; if your patients have found one that they love, you should try to continue it. Generally, we recommend a “wash” formulation for ease of use. 					

	<ul style="list-style-type: none"> • A variety of strengths exist; initial therapy with BP 5% or less is a reasonable approach. • Neutrogena Clear Pore 3.5% wash is a good starter medication • Warn family about bleaching potential on towels, sheets, clothes. • Since this product is drying, it may decrease tolerance for other medications; be aware of concurrent use of benzoyl peroxide and topical retinoids in your sensitive skin patients. Some patients develop true contact dermatitis to benzoyl peroxide. • Concurrent use of benzoyl peroxide will inactivate generic tretinoin. 				
Salicylic Acid	0.5-5% pad, wash, cream, lotion or gel once daily	Skin irritation, allergic contact dermatitis (reported)	Comedonal > Inflammatory	May use during pregnancy. Avoid use on nipple while breastfeeding, otherwise may use on other areas.	Available over the counter
Azelaic Acid	10% or 15% gel, suspension or cream once or twice daily	Skin irritation (3-40%), hypopigmentation (reported)	Comedonal > Inflammatory	May use during pregnancy. May use while breastfeeding.	Some formulations now available over the counter
Dapsone	5 or 7.5% gel once or twice daily	Erythema (0 - 13%), dryness (1.1 - 17%), allergic contact dermatitis (reported)	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding.	Can cause orange discoloration of skin and hair when used with benzoyl peroxide. Limited use in pediatric population. Insurance may not cover. Maybe considered as single therapy or in place of topical antibiotic.
Sulfacetamide-Sulfur	8%/4%, 9%/4.5%, 2/10% or 10%/5% cream, lotion, foam or suspension once or twice daily	Skin irritation, allergic contact dermatitis (reported)	Inflammatory > Comedonal	May use during pregnancy. Caution advised while breastfeeding, though risk of infant harm not expected based on limited maternal absorption	Avoid in patients with sulfa allergy or renal disease
Fixed Dose Combination Topical Treatments					

Benzoyl Peroxide-clindamycin	5%/1%, 3.75%/1.2% or 2.5%/1.2% gel daily	Erythema (1-3%), dryness (0.1 – 12%), burning/stinging (0.1 – 5%), allergic contact dermatitis (reported)	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding.	Can cause bleaching of fabrics.
Benzoyl Peroxide-erythromycin	5%/3% gel daily	Dryness (3 – 7.6%), stinging/burning (0 - 2.5%), allergic contact dermatitis (reported)	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding.	Can cause bleaching of fabrics. <i>C. acnes</i> bacterial resistance to erythromycin is well-known.
Adapalene-Benzoyl Peroxide	0.1%/5% or 0.3%/5% gel daily	Erythema (0 – 41%), dryness (7-55%), stinging/burning (2-59%), allergic contact dermatitis (reported)	Both	Risk of fetal harm not expected based on limited human data and insignificant systemic absorption. May use when breastfeeding	Can cause bleaching of fabrics.
Tretinoin-Clindamycin	0.025%/1.2% gel daily	Erythema (4-26%), dryness (6-22%), burning/stinging (2-13%), allergic contact dermatitis (reported)	Both	Consider avoiding use especially in 1 st trimester; risk of teratogenicity low based on limited human data and minimal systemic absorption. May use when breastfeeding	

Note: Some clinicians prescribe topical benzoyl peroxide and sodium sulfacetamide-sulfur during pregnancy; however, in-depth studies on the safety of benzoyl peroxide and sodium sulfacetamide-sulfur during pregnancy are lacking.

Systemic Treatments	Dose/Formulation	Adverse Effects	Predominant Type of Acne (Comedonal, Inflammatory, Both)	Pregnancy/Lactation Recommendations	Additional Notes
Antibiotics					
Ampicillin	1000mg or 1500mg daily	Gastrointestinal upset, allergic (?) rash	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding	
Amoxicillin	250 mg twice daily or 500 mg twice daily or 500 mg three times daily	Gastrointestinal upset, allergic (?) rash	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding	
Azithromycin	500mg TIW or 500mg x 3 consecutive days every 10 days	Gastrointestinal upset (1.8 – 18%, headache (1.1%), QT prolongation (reported)	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding	
Cephalexin	500mg twice daily	Gastrointestinal upset, vaginal candidiasis, headache, transient elevation of liver enzymes	Inflammatory > Comedonal	May use during pregnancy. May use while breastfeeding	
Doxycycline	50-100mg once or twice daily	Gastrointestinal upset (10 – 25%), photosensitivity (15 – 30.5%), headache (6.5 – 6.7%), pseudotumor cerebri (reported)	Inflammatory > Comedonal	Avoid use during pregnancy; risk of fetal bone/teeth discoloration and enamel hypoplasia; possible risk of fetal toxicity. Avoid breastfeeding if >3 weeks treatment duration.	
<p>Additional Notes:</p> <p>Doxycycline: Take one pill ONCE or TWICE per day, as instructed by your physician.</p> <p><i>NOTE: Always take these pills with lots of water! A pill stuck in the esophagus can cause significant burning and irritation. Avoid “popping” a pill right before bed & stay upright for at least 5 to 10 minutes after taking a pill.</i></p> <p><i>WARNING: Doxycycline increases your sensitivity to the sun, so practice excellent sun protection! If you notice any of the following, stop using the medication and notify the health care provider: headaches; blurred vision; dizziness; sun sensitivity; heartburn or</i></p>					

	<i>stomach pain; irritation of the esophagus; darkening of scars, gums, or teeth (more often with minocycline); nail changes; yellowing of the eyes or skin (indicating possible liver disease); joint pains, and flu- like symptoms. Taking oral antibiotics with food may help with symptoms of upset stomach.</i>				
Minocycline	50-100mg once or twice daily	Gastrointestinal upset (1.5 – 25%, pigment changes (2.4 – 36%), dizziness (10%), pseudotumor cerebri (reported), lupus (0.05%), serum sickness like reaction (reported), autoimmune hepatitis (reported)	Inflammatory > Comedonal	Avoid use during pregnancy; risk of fetal bone/teeth discoloration and enamel hypoplasia; possible risk of fetal toxicity. Avoid breastfeeding if >3 weeks treatment duration.	
<p><i>Additional Notes:</i> Minocycline: Take one pill ONCE or TWICE per day, as instructed by your physician. NOTE: Always take these pills with lots of water! A pill stuck in the esophagus can cause significant burning and irritation. Avoid “popping” a pill right before bed & stay upright for at least 5 to 10 minutes after taking a pill.</p> <p>WARNING: Though less likely than doxycycline, minocycline may increase your sensitivity to the sun, so practice excellent sun protection! If you notice any of the following, stop using the medication and notify the health care provider: headaches; blurred vision; dizziness; sun sensitivity; heartburn or stomach pain; irritation of the esophagus; darkening of scars, gums, or teeth (more often with minocycline); nail changes; yellowing of the eyes or skin (indicating possible liver disease); joint pains, and flu- like symptoms. Taking oral antibiotics with food may help with symptoms of upset stomach.</p> <p>Minocycline can rarely cause liver disease, joint pains, severe skin rashes, and flu-like symptoms. If you should notice yellowing of the eyes or skin or any of the above, notify your doctor and stop using the medication.</p>					
Sarecycline	60mg daily for patients 33-54kg, 100mg daily for patients 55-84kg, 150mg daily for patients 85-136kg	Gastrointestinal upset 1.9 – 4.6%), headache (2.7-2.9%), dizziness (0.4 – 0.6%), photosensitivity (0.2%)	Inflammatory > Comedonal	Avoid use during pregnancy; risk of fetal bone/teeth discoloration and enamel hypoplasia; possible risk of fetal toxicity. Avoid breastfeeding if >3 weeks treatment duration.	

Trimethoprim/ Sulfamethoxazole	80 mg/400 mg daily	Gastrointestinal upset, vestibular symptoms, rare severe cutaneous reactions (Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis)	Inflammatory > Comedonal	Consider alternative during pregnancy; animal studies and limited human studies have shown risk of teratogenicity and fetal loss. Avoid use while breastfeeding an infant with G6PD deficiency. Caution advised while breastfeeding; possible risk poor infant feeding.	
Hormonal Therapies					
Combined oral contraceptives	Norgestimate/ethinyl estradiol), Norethindrone acetate and ethinyl estradiol, Drospirenone/ethinyl estradiol daily	Gastrointestinal upset (4.4%), headache (10%), hypertension (5%), thrombo-embolism (3-5-fold increase relative risk)	Both	Contraindicated during pregnancy. Avoid use while breastfeeding <6 weeks postpartum	
<p><i>Additional Notes:</i></p> <p>Birth Control Pill: Take your birth control pills as directed on the medication packet. NOTE: Try to find a regular time in your day to take the pill so that you don't forget. The best time is about half an hour after a meal or snack or at bedtime. If you do forget to take your daily pill at the regular time, take one as soon as you remember and take the next at your regular scheduled time.</p> <p>WARNING: Do not take this medication until discussing it with your physician if you smoke, are pregnant (or trying to become pregnant), have a personal history of breast cancer, have a condition called Factor 5 Leiden deficiency, have a family history of clotting problems, have migraine headaches (especially with aura or flashing lights), or have any vaginal bleeding other than that associated with your menstrual cycle.</p>					
Spirolactone	25-100mg once or twice daily	Menstrual irregularity (15-30%), breast tenderness (17%), dizziness (4%), hyperkalemia (0.7 – 10%)	Both	Avoid use in pregnancy; risk of fetal anti-androgen effects. May use while breastfeeding	Consider referring to Dermatology

Retinoids					
Isotretinoin	0.5-1mg/kg/day	Mucocutaneous dryness (72-95%), hyperlipidemia (44%), elevated aminotransferases (11%), muscle/joint pain (23%), mood changes (7.8%), pseudotumor cerebri (reported)	Both	Contraindicated during pregnancy; known risk of teratogenicity and fetal demise. Use alternative while breastfeeding	FDA-mandated risk management program, iPledge, required for all patients. Consider referring to Dermatology

Tables adapted from: Eichenfield DZ, Sprague J, Eichenfield LF. Management of Acne Vulgaris: A Review. JAMA. 2021 Nov 23;326(20):2055-2067. doi: 10.1001/jama.2021.17633. PMID: 34812859.