Quick Evidence Synopsis
Minocycline for Acne Vulgaris

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What is the clinical question? What are the benefits and harms of oral minocycline for moderate to severe acne vulgaris?

Intervention	Quality of Evidence	Balance Between Benefits and Harms
Minocycline vs placebo	Low	Trade-off between benefits and harms

Quality of evidence: quality of evidence scale (GRADE [Grading of Recommendations Assessment, Development, and Evaluation]): high, moderate, low, and very low. For more information on the GRADE rating system, see http://www.gradeworkinggroup.org/index.htm.

Balance between benefits and harms: The Guideline Elements Model: beneficial, likely to be beneficial, unknown effectiveness, trade-off between benefits and harms, likely harmful, and harmful. For more information, see http://gem.med.yale.edu/default.htm.

What are the parameters of the evidence search?

Population: adults and adolescents (≥12 years old) with moderate to severe acne vulgaris
Setting: outpatient
Intervention: minocycline (oral)
Comparator: placebo
Outcomes: change in lesion count, adverse events

What is the basis for the conclusions?

Population: adults and adolescents (≥12 years old) with moderate to severe acne vulgaris
Intervention: minocycline (oral)
Comparator: placebo
Setting: outpatient (**Table 1**)

What do clinical guidelines say?

Guidelines of Care for the Management of Acne Vulgaris. American Academy of Dermatology, 2016[2] (AGREE II [Appraisal of Guidelines for Research and Evaluation II] score: unavailable).

- Tetracyclines, including minocycline, doxycycline, and tetracycline, are recommended as first-line therapy in the treatment of moderate to severe acne and forms of inflammatory acne that are difficult to treat (Strength of recommendation: A. level of evidence: I, II)
- Tetracyclines should not be used when contraindicated, such as in pregnant women or children less than or equal to 8 years of age, or allergy, in which case oral erythromycin and azithromycin can be administered.
- Doxycycline and minocycline are more effective than tetracycline, but neither is superior to the other.
- Erythromycin use should be restricted, because of its increased risk of bacterial resistance. Use of systemic antibiotics, other than the tetracyclines and macrolides, is discouraged, because there are limited data for their use in acne.

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Table 1

Outcomes	Assumed Risk[a] Placebo	Corresponding Risk[a] Minocycline	Relative Effect (95% CI)	Number of Participants (Studies)	Confidence in the Effect Estimates (GRADE)	Comments
Mean % decrease in total lesion count (SD) at 12-wk follow-up	23.9 (41.9) N = 364	35.6 (41.9) N = 674	9.84 (4.84–14.84)	1038 (3 RCTs)[1]	Low	Favors minocycline
Adverse drug reactions[b]	28 out of 76	106 out of 186	1.25 (0.95–1.65)	262 (2 RCTs)[1]	Low	No difference

Abbreviations: CI, confidence interval; GRADE, Grading of Recommendations Assessment, Development and Evaluation; RCT, randomized controlled trial; SD, standard deviation.

[a] Illustrative comparative risks.

[b] Adverse drug reactions include gastrointestinal disorders, nausea, vertigo, drug-induced lupus, autoimmune hepatitis, autoimmune vasculitis, rheumatoid arthritis, hyperpigmentation, intracranial hypertension, liver damage, inflammatory bowel disease, and antineutrophil antibody and antineutrophil cytoplasmic antibody positivity.

Evidence-Based Recommendations for the Diagnosis and Treatment of Pediatric Acne. American Academy of Pediatrics, 2013[3] (AGREE II score: unavailable)

- Extended-release minocycline dosed at 1 mg/kg/d (administered as 1 tablet daily) is US Food and Drug Administration (FDA) approved for the treatment of moderate to severe inflammatory acne vulgaris that is not predominantly nodular in patients greater than or equal to 12 years of age.
- Both immediate-release doxycycline and immediate-release minocycline have the indication listed in their FDA-approved labeling of adjunctive use for severe acne, although this was not based on formal submission for FDA approval for either drug.
- For children more than 8 years old, the commonly used oral antibiotics are minocycline, tetracycline, and doxycycline.
- For children less than 8 years old or those with allergies, alternative antibiotics (azithromycin, erythromycin, trimethoprim/sulfamethoxazole) may be used judiciously.

European Evidence-based (S3) Guidelines for the Treatment of Acne. European Academy of Dermatology and Venereology, 2012.[4–6] (AGREE II score: 81.8%)

- The use of topical and systemic antibiotics should be optimized by using appropriate combinations for a predefined duration to reduce the development of antibiotic resistance.
- When choosing a treatment, different skin types, ethnic groups, and subtypes of acne must also be considered.
- The efficacies of doxycycline, lymecycline, minocycline, and tetracycline are comparable.
- Tetracycline has a lower practicability and patient preference compared with doxycycline, lymecycline, and minocycline.
- More severe drug reactions are experienced during treatment with minocycline compared with doxycycline, lymecycline, and tetracycline.

Antibiotic resistance:

- The first relevant changes in *Propionibacterium acnes* antibiotic sensitivity were found in the United States shortly after the introduction of the topical formulations of erythromycin and clindamycin.
- Combined resistance to clindamycin and erythromycin is much more common (the highest prevalence is 91% in Spain) than resistance to the tetracyclines, which includes minocycline (the highest prevalence is 26% in the United Kingdom).