

# Treating acne with the tetracycline class of antibiotics:

## A review

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### Abstract

Acne, one of the most common dermatologic conditions seen by dermatologists, is frequently treated with oral antibiotics. As such, dermatologists prescribe more antibiotics than any other specialty, the majority of which are of the tetracycline class. This family of antibiotics includes tetracycline, doxycycline, minocycline, and sarecycline. Although linked by a similar mechanism of action, each agent has unique characteristics that should be considered carefully. Sarecycline, recently approved by the United States Food and Drug Administration, is a narrow spectrum antibiotic about antibiotic resistance and the need for antibiotic stewardship may make a narrow spectrum antibiotic such as sarecycline the optimal choice for the In contrast, tetracycline, doxycycline, and minocycline are broad spectrum antibiotics

KEYWORDS

acne, antibiotic, doxycycline, minocycline, sarecycline, tetracycline

## 1 | BACKGROUND

Dermatologists prescribe more antibiotics per patient than any other specialty. <sup>1</sup> Per provider, dermatologists prescribed 572 oral antibiotics annually, compared to 293 for providers of other specialties in 2017. <sup>2</sup> This fact is not surprising given the prevalence of acne patients and their need for oral antibiotics. Approximately 50 million people in the United States suffer from acne vulgaris and acne is one of the top three diagnoses for primary care physicians. <sup>3</sup> Cutibacterium (formerly Propionibacterium), part of the normal skin flora, plays a key role in acne pathogenesis. The tetracycline class of antibiotics inhibits C. acnes growth in the pilosebaceous unit thus making the tetracyclines successful in treating acne. <sup>4</sup>

## 2 | TETRACYCLINES FAMILY —OVERVIEW

The tetracyclines (Figure 1) are the most widely studied and frequently prescribed oral antibiotics for acne and the only class of antibiotics with the United States Food and Drug Administration (FDA) indications for acne treatment. Shortly after the isolation of the parent compound, chlortetracycline, from Streptomyces aureofaciens in 1947, reports of the success of the tetracycline family of antibiotics were published. <sup>5,6</sup> Since its discovery, the tetracycline family has evolved to include synthetic compounds or modifications of naturally occurring tetracyclines. The most commonly prescribed semi-synthetic tetracyclines include the second generation members doxycycline and minocycline, which

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