

Medication Analysis Report

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Analysis System: MedicationAnalyzer (Comprehensive Drug Analysis)

Analysis Cost: \$0.3502

Duration: 443.8s

Medication Overview

Name:

doxycycline

Drug Class: Pharmacologic class: Tetracycline antibiotic. Therapeutic class: Antibacterial agent, antimalarial agent, anti-inflammatory agent (in subantimicrobial doses).

Analysis Confidence: 0.75/1.00

Mechanism of Action

Doxycycline reversibly binds to the 30S ribosomal subunit of susceptible bacteria, specifically blocking the binding of aminoacyl-tRNA to the mRNA-ribosome complex at the acceptor (A) site. This inhibits bacterial protein synthesis by preventing the addition of amino acids to the growing peptide chain...

Pharmacokinetics Summary

- **Absorption:** Oral bioavailability: 90-100% (nearly complete absorption). Absorption is minimally affected by food...
 - **Metabolism:** Minimal hepatic metabolism. Does not undergo significant CYP450-mediated metabolism. Not converted t...
 - **Elimination:** Primary route: Fecal elimination (20-40% as active drug via bile and direct intestinal secretion) an...
 - **Half-Life:** 15-25 hours (average 18-22 hours in adults with normal renal and hepatic function). Half-life may be prolonged to 20-30 hours in patients with severe hepatic impairment.
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Key Safety Information

Interactions Summary

SEVERE Drug Interactions (3)

- **Isotretinoin**
 - Effect: Increased intracranial pressure, papilledema, headache, visual disturbances...
 - Management: Avoid concurrent use. If combination necessary, monitor closely for signs of intracranial hypertensi...
- **Methoxyflurane**
 - Effect: Fatal renal toxicity, acute tubular necrosis...

- Management: Contraindicated. Avoid concurrent use...

- **Warfarin**

- Effect: Enhanced anticoagulant effect, increased INR, bleeding risk...
- Management: Monitor INR closely when initiating or discontinuing doxycycline. Adjust warfarin dose as needed...

Moderate Drug Interactions (11)

- **Antacids (aluminum, calcium, magnesium):** Decreased doxycycline bioavailability and therapeutic efficacy...
- **Iron supplements:** Reduced doxycycline serum concentrations and efficacy...
- **Calcium supplements:** Decreased doxycycline bioavailability...

Evidence-Based Recommendations

For complete details including all interactions, dosing adjustments, and comprehensive recommendations, see the detailed report.

DISCLAIMER:

This analysis is for educational and research purposes only. Always consult qualified healthcare providers for medication decisions.