

# How Frequently Are Drug Interactions Identified in Patients on Warfarin Presenting to the Emergency Department with a Supratherapeutic INR?

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**Background:** One of the most serious complications from warfarin therapy is bleeding, the risk of which increases with an increasing International Normalized Ratio (INR). Frequently, a drug interaction involving warfarin is the cause of this elevated INR.

**Methods:** The study was approved by our institutional IRB. The study was designed as a prospective observational study over an 18 month period. The author and a dedicated research nurse identified patients on warfarin with a supratherapeutic INR (S-INR) who presented to the ED. A questionnaire was completed that included a comprehensive review of all of the patients medications, including new meds, recently prescribed and completed prescriptions, over the counter meds, and dietary or herbal supplements. Exclusion criteria included critical illness, unwillingness to participate, or inability to complete the questionnaire

**Results:** 47 patients were identified in the study period. Mean S-INR was 5.9 (range, 4.1->10). Serious bleeding complications (intracranial hemorrhage, gastrointestinal bleeding, uncontrolled epistaxis) were present in 4/47. Of these 47, a clearly identifiable trigger for the S-INR was identified in only 20 (see table 1). Of these, a prescription for ciprofloxacin was the most common etiology (7/20), followed by prescriptions for other antimicrobials (5), NSAID (5), increased dose of warfarin (3). No dietary or herbal supplement use was identified that was felt to be contributory.

**Discussion:** A clear trigger for S-INR was identified in less than half the patients in this study. Limitations include potential recall bias by the patients and inability to control for accuracy of reported dosing (many patients were on alternating dosage schedules of warfarin and may have doubled up on doses inadvertently). Ciprofloxacin was the most common drug implicated.

**Conclusion:** An etiology for S-INR in patients taking warfarin was found in less than half the patients in our study. Of the etiologies identified, all were prescription drug related, reflecting the need for provider education and better system redundancies to improve medication safety.

Drug Interactions Identified

