Inpatient management of excessive warfarin anticoagulation

INR/Clinical scenario	Management: Identifiable Cause	Management: No Identifiable Cause
INR < 5.0 without significant bleeding	Look for potential interacting medications or other identifiable reason for elevated INR Eliminate interacting medication or cause of elevated INR, hold warfarin and recheck INR every 12-24 hours When INR approaches the therapeutic range (INR < 4) resume warfarin at previous dose and check INR daily	Look for potential interacting medications or other identifiable reason for elevated INR If no identifiable reason noted or reason cannot be corrected, hold warfarin and recheck INR in 12-24 hours When INR approaches the therapeutic range (INR < 4) resume warfarin at 15-20% lower weekly dose and check INR daily
INR ≥ 5 but < 9 without significant bleeding	Look for potential interacting medications or other identifiable reason for elevated INR Eliminate interacting medication or reason of elevated INR, hold warfarin and recheck INR every 12 hours If at high risk for bleeding*, give vitamin K_1 1-2.5 mg PO X 1 dose When INR approaches the therapeutic range (INR < 4.0) restart warfarin at previous dose and check INR daily If patient needs reversal for an urgent invasive procedure (within 24 hours), give vitamin K_1 up to 5 mg PO X 1 dose	Review medication list for interacting medication If no identifiable reason noted or reason cannot be corrected, hold warfarin and recheck INR every 12 hours If at high risk for bleeding*, give vitamin K_1 1-2.5 mg PO X 1 dose When INR approaches the therapeutic range (INR < 4) resume warfarin at 20% lower weekly dose and check INR daily If patient needs reversal for an urgent invasive procedure (within 24 hours), give vitamin K_1 up to 5 mg PO X 1 dose
INR ≥ 9 without significant bleeding	Look for potential interacting medications or other identifiable reason for elevated INR Eliminate interacting medication or reason of elevated INR Hold warfarin, give higher dose vitamin K_1 5 mg PO and monitor INR every 12 hours May use additional vitamin K_1 (1-2 mg PO) if needed When INR approaches the therapeutic range (INR < 4) restart warfarin at previous dose and check INR daily	Look for potential interacting medications or other identifiable reason for elevated INR If no identifiable reason noted or reason cannot be corrected Hold warfarin, give higher dose vitamin K_1 5 mg PO and monitor INR every 12 hours May use additional vitamin K_1 (1-2 mg PO) if needed When INR approaches the therapeutic range (INR < 4) resume warfarin at weekly dose at least 20% lower and check INR daily
Serious bleeding at any INR elevation	Look for potential interacting medications or other identifiable reason for elevated INR Eliminate interacting medication or reason of elevated INR Hold warfarin Give vitamin K_1 10 mg IV over 1 hour in monitored setting with an anaphylaxis kit at bedside Consider use of FFP, or NovoSeven (20 µg/kg IV) or FEIBA 50 units/kg IV Monitor INR at least q6h	Look for potential interacting medications or other identifiable reason for elevated INR If no identifiable reason noted or reason cannot be corrected Hold warfarin Give vitamin K_1 10 mg IV over 1 hour in monitored setting with an anaphylaxis kit at bedside Consider use of FFP, or NovoSeven (20 µg/kg IV) or FEIBA 50 units/kg IV Monitor INR at least q6h
Life-threatening bleeding	Look for potential interacting medications or other identifiable reason for elevated INR Eliminate interacting medication or reason of elevated INR Hold warfarin Give NovoSeven 20-40 µg/kg IV or FEIBA 50 units/kg IV Give vitamin K_1 10 mg IV over 1 hour in a monitored setting with an anaphylaxis kit at bedside Monitor INR at least q6h Vitamin K_1 can be repeated in 12 hours, depending upon INR	Look for potential interacting medications or other identifiable reason for elevated INR If no identifiable reason noted or reason cannot be corrected Hold warfarin Give NovoSeven 20-40 µg/kg IV or FEIBA 50 units/kg IV Give vitamin K_1 10 mg IV over 1 hour in a monitored setting with an anaphylaxis kit at bedside Monitor INR at least q6h Vitamin K_1 can be repeated in 12 hours, depending upon INR

Reference: Ansell J, et al. The pharmacology and management of the vitamin K antagonists: The Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Chest 2004; 126 (Suppl): 204S-233S * Bleeding risk factors include recent surgery (within 1 month), active cancer, history of gastrointestinal bleeding or cerebrovascular accident, age > 65, serum creatinine > 1.5 mg/dL

These management guidelines are meant to be flexible. Although they should be followed in most cases, guidelines do not supersede clinical decision making depending on the patient, the setting, or other factors which may influence such decisions.