

MANAGING ORAL ANTICOAGULANT THERAPY IN PATIENTS WITH HIGH INR VALUES

PURPOSE: To provide guidelines to ensue the safe use of vitamin K. The goal in administration of vitamin K therapy should be to quickly lower the INR to a safe but not subtherapeutic range, and to avoid development of resistance to warfarin therapy if the medication needs to be restarted. **High doses of vitamin K may lower the INR more than is necessary and may lead to warfarin resistance for up to a week.**

CLINICAL SITUATION	GUIDELINES
Goal INR: 2-3 for most patients, up to 4 for some heart valves and coagulation disorders	
INR above therapeutic range but <5; No significant bleeding	<ul style="list-style-type: none"> Lower the dose; or omit the next dose Resume therapy at a lower dose when the INR therapeutic NOTE: if the INR minimally above therapeutic range, dose reduction may not be necessary
INR \geq 5 but <9; No significant bleeding Increased risk for bleeding or minor bleeding evident Rapid reversal for urgent surgery	<ul style="list-style-type: none"> Omit the next dose or two, monitor INR more frequently. Resume therapy at a lower dose when the INR is therapeutic. Omit dose and give vitamin K 1-2.5 mg orally. Monitor INR and resume at lower dose. Vitamin K 2.5-5 mg orally. Expect reduction of INR in 24 hours. If INR still high at 24 hours: an additional vitamin K 1-2.5mg orally can be given.
INR \geq 9; No significant bleeding	<ul style="list-style-type: none"> Hold warfarin; give vitamin K 2.5-5mg orally; expect substantial reduction of INR in 24-48 hours. Monitor the INR more often, and give additional vitamin K if necessary. Resume therapy at a lower dose when the INR is within therapeutic range.
Serious bleeding at any INR elevation	<ul style="list-style-type: none"> Hold warfarin, give vitamin K 10mg slow IV infusion; Supplement with fresh frozen plasma (1-2 units) depending on urgency; (up to 20 ml/kg) Vitamin K injections can be repeated every 12 hours. FFP can be repeated every 6-12 hours. Consider factor supplementation (prothrombin complex concentrate, Factor VIIa) for life-threatening bleed.

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- Oral administration is the preferred route whenever possible. Onset of action is within 6-12 hours. For oral doses of vitamin K other than in increments of 2.5 mg, injectable vitamin K may be given orally.
- IM administration should not be used to avoid the risk of hematoma.
- IV administration is the preferred route for **severe bleeding situations**, although its administration does carry a risk for anaphylaxis. Onset of action is within 1 - 2 hours.
- Subcutaneous route of administration is erratic and not preferred for rapid reversal. Onset of action is slower than oral administration.
- FFP is a blood product containing a concentration of clotting factors. It works immediately with full effect in 6 hours.