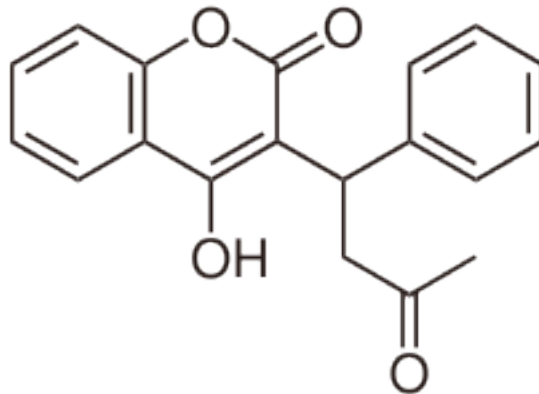


WARFARIN GUIDELINES



Therapeutic INR Ranges:

- **INR 2 - 3:** DVT prophylaxis, DVT or PE treatment, prevention of systemic embolism (bioprosthetic heart valves, AMI, valvular heart disease, AF), low risk antiphospholipid antibody syndrome (no risk factors, no lack of response to therapy)
- **INR 2.5 - 3.5:** Mechanical prosthetic heart valves, high risk antiphospholipid antibody syndrome (recurrent thromboembolic events with therapeutic INR), recurrent thromboembolism

Frequency of INR Monitoring:

- Check baseline INR prior to ordering warfarin
- Check INR daily (AM lab) until therapeutic for two consecutive days then two-three times weekly during initiation

Drug Interactions: Listed are some common clinically significant interactions.

Increase INR amiodarone, bactrim, macrolides, metronidazole, phenytoin, tamoxifen, quinolones, fluconazole, antiplatelet agents

Decrease INR barbiturates, rifabutin, rifampin, carbamazepine

Warfarin Initiation Nomogram:

Initial dose selection:

- Loading doses are not recommended because they may increase the risk of bleeding
- Patients previously on warfarin with no changes in health status may be restarted on previous dose if INR was in target range.
- **Initiation of warfarin should be 5 mg daily in most patients** (usually achieves INR ≥ 2 in 4-5 days)
- **A starting dose ≤ 5 mg should be considered for patients >65 yrs, liver disease, malnourished, severe heart failure, or concomitant drugs affecting warfarin metabolism.**
- If overlapping LMWH or heparin with warfarin, overlap for at least 5 days. Discontinue LMWH or heparin when INR is therapeutic on two consecutive measurements 24 hr apart.

Day	INR	Dose (target INR 2 - 3)	Dose (target INR 2.5 - 3.5)
1 -		Select initial dose	Select initial dose
2 -		Continue initial dose	Continue initial dose
3			
	< 1.5	1 - 1.5 x initial dose	1.5 x initial dose
	1.5 - 1.9	Continue initial dose	Continue initial dose
	2.0 - 2.5	0.5 - 1 x initial dose	Continue initial dose
	2.6 - 3.0	0.5 x initial dose	0.5 - 1 x initial dose
	> 3.0	Hold dose	0.5 - initial dose
4			
	< 1.5	1.5 - 2 x initial dose	2 x initial dose
	1.5 - 1.9	1 - 1.5 x initial dose	1.5 - 2 x initial dose
	2.0 - 2.5	Continue last dose	Continue last dose
	2.6 - 2.9	0.75 x initial dose	Continue last dose
	3.0 - 3.5	Hold dose	Continue last dose
	> 3.5	Hold dose	Hold dose
5			
	< 1.5	2 x initial dose	2.5 x initial dose
	1.5 - 1.9	1.5 - 2 x initial dose	2 x initial dose
	2.0 - 2.5	Continue last dose	1.5 x initial dose
	2.6 - 2.9	0.75 x initial dose	Continue last dose
	3.0 - 3.5	0.5 x initial dose	Continue last dose
	> 3.5	Hold dose	0.75 x initial dose

6

< 1.5	2 x initial dose	2.5 x initial dose
1.5 - 1.9	1.5 - 2 x initial dose	2 x initial dose
2.0 - 2.5	Continue last dose	1.5 x initial dose
2.6 - 2.9	Continue last dose	Continue last dose
3.0 - 3.5	0.75 x initial dose	Continue last dose
> 3.5	Hold dose	0.75 x initial dose

7

< 2	2 x initial dose	2.5 x initial dose
2 - 2.5	Continue last dose	1.5 - 2 x initial dose
2.6 - 2.9	Continue last dose	Continue last dose
3.0 - 3.5	0.8 - 0.9 x initial dose	Continue last dose
> 3.5	0.8 x initial dose	0.8 - 0.9 x initial dose

***Round all doses to the nearest 0.5 mg**

Dosage Adjustments for Warfarin Maintenance Therapy:

- Doses are scheduled to be administered at 1730
- Since warfarin displays non linear kinetics, small dosage adjustments (1 - 2.5 mg) are recommended.
- Dosage adjustments are not required for minor INR fluctuations as long as the INR remains in the target range

Warfarin dosing after week 1: Target INR 2.0 - 3.0

INR	Dose Adjustment
< 1.5	Increase weekly dose by 10 - 20%
1.5 - 1.9	Increase weekly dose by 10 - 15%
2.0 - 3.3	No change
3.4 - 4.0	Decrease weekly dose by 5 - 15%
4.1 - 5.0	Hold 1 - 2 doses and decrease weekly dose by 10 - 20%
> 5.0	See recommendations for managing elevated INR When resume decrease weekly dose 15 - 20%

Warfarin dosing after week 1: Target INR 2.5 - 3.5

INR	Dose Adjustment
< 2	Increase weekly dose by 10 - 20%
2.0 - 2.4	Increase weekly dose by 10 - 15%
2.5 - 3.7	No change
3.8 - 4.0	Decrease weekly dose by 5 - 15%
4.1 - 5.9	Hold 1 - 2 doses and decrease weekly dose by 10 - 20%
> 5.9	See recommendations for managing elevated INR When resume decrease weekly dose 15 - 20%

Recommendations for Managing Elevated INRs or Bleeding in Patients Receiving Warfarin:

Condition Recommendation

**INR above therapeutic range but < 5;
no significant bleeding**

Lower the dose or omit a dose and resume with lower dose when INR therapeutic; if only minimally above therapeutic range, no dose reduction may be required.

INR ≥ 5 but < 9; no significant bleeding

Omit next one or two doses, monitor INR more frequently, and resume with lower dose when INR therapeutic. If risk of bleeding, omit the next dose and give vitamin K 2.5 mg PO.

INR \geq 9; no significant bleeding

Hold warfarin and give Vitamin K 2.5 - 5 mg orally; expect substantial INR reduction in 24-48hr. Monitor INR more frequently and repeat vitamin K if necessary. Resume warfarin at an adjusted dose when INR therapeutic.

Serious bleeding at any elevation of INR

Hold warfarin and give vitamin K 10 mg slow IV infusion, supplemented with FFP, prothrombin complex concentrate or rVIIa, depending on urgency of situation. Vitamin K can be repeated q12hr

Life threatening bleeding Hold warfarin and give FFP, prothrombin complex concentrate, or rVIIa supplemented with vitamin K 10 mg slow IV infusion. Repeat, if necessary, depending on INR.

Interruption of Warfarin Therapy for Surgery:

Condition and Recommendation

Low risk of thromboembolism

Stop warfarin 5 days before surgery allowing INR to return to near normal. Bridge therapy with low dose LMWH or no bridging.

Moderate risk of thromboembolism

Stop warfarin 5 days before surgery allowing INR to fall, start bridge therapy with therapeutic dose LMWH 2-3 days prior to surgery (or when INR is sub-therapeutic). Administer last dose of LMWH 24 hrs before surgery.

High risk of thromboembolism

Stop warfarin 5 days before surgery allowing INR to fall, start bridge therapy with therapeutic dose LMWH 2-3 days prior to surgery (or when INR is sub-therapeutic). Administer last dose of LMWH 24hrs before surgery.

Low risk of bleeding

Lower warfarin dose and operate at an INR of 1.3-1.5; the dose may be lowered 4-5 days before surgery; warfarin can be restarted post-op, suppl. with LMWH if necessary.

Urgent surgical or other invasive procedure (within 12 hrs)

For immediate reversal give FFP, prothrombin complex concentrate, or rVIIa, in addition to vitamin K 2.5-5 mg po or by slow IV infusion.

Urgent surgical or other invasive procedure (within 18-24 hrs)

If surgery is urgent but can be delayed for 18-24 hrs give vitamin K 2.5- 5 mg po or by slow IV infusion. If INR is still high, additional vitamin K 1-2 mg po can be given.

Low risk: VTE: Single VTE occurred >12 months ago and no other risk factors, **Afib:** (CHADS2 score 0-2) without a history of stroke or other risk factors, **Mech heart valve:** bileaflet aortic valve without Afib and no other risk factors for stroke.

Moderate risk: VTE: VTE within 3-12 months, nonsevere thrombophilic conditions, recurrent VTE, active cancer, **Afib:** (CHADS2 score 3 or 4),

Mech heart valve:

bileaflet aortic valve and one of the following: Afib, prior stroke or TIA, HTN, DM, CHF, age >75 yr.

High risk: VTE: recent (within 3mo)VTE, severe thrombophilia, **Afib:**(CHADS2 score 5 or 6), recent (within 3 months) stroke or TIA, rheumatic valvular heart disease,

Mech heart valve: any mitral valve prosthesis, older aortic valve prosthesis (caged-ball or tilting disc), recent (within 6 months) stroke or TIA

Resume warfarin therapy 12-24 hrs after surgery and when there is adequate hemostasis.

Resume bridge therapy:

- Minor surgery or other invasive procedure and receiving therapeutic dose LMWH: Resume 24 hrs after the procedure when there is adequate hemostasis
- Major surgery or high bleeding risk surgery/procedure where postop therapeutic dose LMWH is planned: delay initiation of therapeutic dose LMWH for 48-72 hours after surgery when hemostasis is secured or administering low dose LMWH after surgery when hemostasis is secured or completely avoiding LMWH after surgery.