

Day of Warfarin	Post-Op Day #	INR	Warfarin Dose
1	1	5 mg	5 mg
2	2	< 1.3	7.5 mg
3	3	< 1.3 - 1.5	5 mg
		< 1.5 - 1.9	2.5 mg
		< 2.0 - 2.5	2 mg
4	4	< 1.5	5 - 10 mg*
		< 1.9 - 2.5	2 - 5 mg
		< 2.0 - 2.5	2 mg
5	5	< 1.5	7.5 - 10 mg
		< 1.9 - 2.5	2 - 5 mg
		< 2.0 - 2.5	1 - 2 mg
6	6	< 1.5	7.5 - 10 mg
		< 1.9 - 2.5	2.5 - 7.5 mg
		> 2.5	1 - 2.5 mg

Warfarin Initiation Nomogram for DVT Prophylaxis in Hip/Knee Arthroplasty
(Target INR 2.2 [2.0-2.5])

* Consider addition of enoxaparin at DVT prophylaxis dose with attending physician approval.

Day	INR	Dosage
1	5 mg	5 mg
2	< 1.5	5 mg
3	< 1.5	1 - 2.5 mg
	< 1.9 - 2.5	2.0 - 2.5 mg
	< 2.5	0
4	< 1.5	5 - 10 mg
	< 1.9 - 2.5	2.5 - 5 mg
	< 2.0 - 2.5	2.0 - 2.5 mg
5	< 1.5	7.5 - 10 mg
	< 1.9 - 2.5	2.0 - 3.0 mg
	< 3.0	0
6	< 1.5	7.5 - 12.5 mg
	< 1.9 - 2.5	5 - 10 mg
	> 3.0	0

Warfarin Initiation Nomogram for Thrombotic Treatment (Target INR 2-3)

Adapted from: Arch Intern Med. 1999; 159: 46-48; and Ann Intern Med. 1997; 127: 332-333.

Anticoagulation Therapy Guidelines for Orthopedic Patients
Guidelines/recommendations provided for reference. Treatment plans should be individualized as per patient needs. (Updated May 2010)



ENOXAPARIN (Lovenox®) for Deep Vein Thrombosis (DVT) Prophylaxis
Lab Monitoring: CBC and serum creatinine at the start of enoxaparin

Indication	Standard Regimen	Dose For Serum Creatinine < 30 mL/min [NOT for Dialysis Patients]
DVT prophylaxis in knee replacement surgery	30 mg SC every 12 hours for up to 2 weeks (until suture removal)	30 mg SC once daily
DVT prophylaxis in hip replacement surgery	30 mg SC every 12 hours or 40 mg SC once daily for up to 2 weeks (until suture removal)	30 mg SC once daily
DVT prophylaxis in spinal surgery patients (off-label)	After drain/indwelling catheter removal for 24 hours, 30 mg SC every 12 hours until patient mobilizing well	—

WARFARIN (Coumadin®, Jantoven®) - Alternative to Enoxaparin for DVT Prophylaxis, as per Attending MD
See Nomograms for Initiation Guidelines When Used for DVT Prophylaxis in Orthopedic Surgery

- ▶ **Hip/Knee Arthroplasty** Target INR 2.2 (Range 2.0 to 2.5)
Start warfarin on morning of surgery, followed by dose on morning of post-operative day (POD) #1. Give warfarin doses starting POD #2 at bedtime. Adjust dose as per INR.
- ▶ **Spine/Pelvic Surgery** Target INR 1.5 to 2.0
Spinal surgery: May start warfarin in patients at very high risk for venous thromboembolism (VTE) after drain removal and hemostasis. VTE risk factors include increased age, previous VTE, anterior spinal approach, malignancy, prolonged procedure, reduced mobility, morbid obesity, severe coronary heart disease.
Pelvic surgery: May start warfarin in selected patients after hemostasis on post-operative day #1. NO enoxaparin.

Lab Monitoring: Note: INR results from point-of-care instrumentation may vary from results from centralized/main laboratory instrumentation. Centralized laboratory testing is the gold standard. Use centralized laboratory testing for hospitalized patients. CBC and PT/INR within 24 hours prior to first dose, then CBC daily INR daily (start day 2-3) until 2 target values ≥ 24 hrs apart, then twice weekly x 1 wk, then at least once q2 wks x 1 month

WARFARIN — Recommendations for Management of Supratherapeutic INRs.
Consider consultation with specialists for complex patients (e.g., mechanical heart valves).

INR	Bleeding Present	Recommended Action
> Therapeutic range to > 5.0	No significant bleeding	Omit one dose and resume warfarin at a lower dose when INR is in therapeutic range, or No dose reduction needed if INR is minimally prolonged
≥ 5.0 to 9.0	No significant bleeding	Omit the next 1 to 2 doses of warfarin, monitor INR more frequently, and resume treatment at a lower dose when INR is in therapeutic range, or Omit one dose and administer 2.5 mg oral vitamin K*
≥ 9.0	No significant bleeding	Hold warfarin and administer 2.5 — 5 mg oral vitamin K. (INR should decrease in 12 — 24 hours.) Monitor INR more frequently and administer more vitamin K as needed. Resume warfarin at a lower dose when INR is in therapeutic range
Any elevation of INR	Serious or life-threatening bleeding	Hold warfarin and administer 10 mg vitamin K by slow IV infusion; suspend warfarin with prothrombin complex concentrate, fresh frozen plasma, or recombinant human factor VIIa, depending on clinical urgency. Consider consultation with Blood Bank. Monitor and repeat as needed.

* This option is preferred in patients at increased risk for bleeding (e.g., history of bleeding, stroke, renal insufficiency, anemia, hypertension). Adapted from: Chest 2008; (6 Suppl):160s.

Reversal of Warfarin with Vitamin K (Phytonadione)

- ◆ Oral route preferred (available as 5-mg tablets).
- ◆ No intramuscular injections—Risk of hematomas.
- ◆ IV infusion 10 mg in 50 mL NS or D5W over 10—30 minutes.
- ◆ IV push associated with greater risk of anaphylaxis.
- ◆ Vitamin K treatment may prolong time to return to target INR when warfarin restarted.

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1	5 mg	5 mg
2	< 1.2	5 mg
3	< 1.2	5 mg
	< 1.4 - 1.9	2 - 5 mg
	< 2.0 - 2.5	0 mg
4	< 1.4	2 - 5 mg
	< 1.9 - 2.0	0 - 2.5 mg
	< 2.0	0 mg
5	< 1.4	2 - 5 mg
	< 1.9 - 2.0	0 - 2.5 mg
	> 2.0	0 mg

Warfarin Initiation Nomogram for DVT Prophylaxis in Spinal/Pelvic Surgery
(Target INR Range 1.5 to 2.0)

May Increase INR or Bleeding Risk	May Decrease INR
Alcohol (in liver disease) Isontiazid Levofloxacin Acetaminophen Anidaronone Loop diuretics Macrolide antibiotics Metronidazole NSAIDs Cefazolin Cefmetazole Cefepime Ceftriaxone Cefotetan Cimetidine Propafenol Serraline Tetracycline Trimethoprim Sulfamethoxazole	Barbiturates Cholestyramine Dichloxacillin (unlike other penicillins) Griseofulvin Influenza vaccine Mercaptopurine Multivitamins with vitamin K Nafillin (unlike other penicillins) Ritampin Ritonavir Sucralfate Vitamin K in foods Vitamin K in enteral feeds

Common Drug Interactions with Warfarin
Consult drug references for mechanisms of interactions. (Monitor INR more frequently) Alcohol (in liver disease) Isontiazid Levofloxacin Acetaminophen Anabolic steroids Aspirin Azole antifungals Cefazolin Cefmetazole Ceftriaxone Cefotetan Cimetidine Propafenol Serraline Tetracycline Trimethoprim Sulfamethoxazole

Consult drug references for mechanisms of interactions. (Monitor INR more frequently)