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

Day of Warfarin Treatment	Post-Op Day (POD) #	INR	Warfarin Dose
1	0		5 mg
2	1		5 mg
3	2	< 1.3	7.5 mg
		1.3 – 1.5	5 mg
		1.6 – 1.9	2.5 mg
		2.0 – 2.5	2 mg
		> 2.5	0 mg
4	3	< 1.5	5 mg
		1.6 – 1.9	2.5 mg
		2.0 – 2.5	2 mg
		> 2.5	0
5	4	< 1.5	5 – 10 mg*
		1.6 – 1.9	2 – 5 mg
		2.0 – 2.5	1 – 2 mg
		> 2.5	0 mg
6	5	< 1.5	7.5 – 10 mg
		1.6 – 1.9	2.5 – 7.5 mg
		2.0 – 2.5	1 – 2.5 mg
		> 2.5	0 mg

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

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

Day of Warfarin Treatment	INR	Warfarin Dose
1		5 mg
2	< 1.2	5 mg
	1.3 – 1.4	2 - 5 mg
	1.5 – 2.0	1 – 2.5 mg
	> 2.0	0 mg
3	< 1.2	5 mg
	1.3 – 1.4	2 - 5 mg
	1.5 – 2.0	0 – 2.5 mg
	> 2.0	0 mg
4	< 1.4	2 – 5 mg
	1.5 – 2.0	0 – 2.5 mg
	> 2.0	0 mg
5	< 1.4	2 – 5 mg
	1.5 – 2	0 – 2.5 mg
	> 2.0	0 mg

WARFARIN MAINTENANCE DOSES:

Average daily dose over last week of therapy, once two consecutive INRs in target range.

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

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

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

Common Drug Interactions with Warfarin
(Monitor INR more frequently)
Consult drug references for mechanisms of interactions.

May Increase INR or Bleeding Risk	
Alcohol (in liver disease)	Isoniazid
Acetaminophen	Levofloxacin
Amiodarone	Loop diuretics
Anabolic steroids	Macrolide antibiotics
Aspirin	Metronidazole
Azole antifungals	NSAIDs
Cefazolin	Omeprazole
Cefmetazole	Penicillins (e.g., Amoxicillin)
Cefoperazone Cefotetan	Phenytoin
Cimetidine	Propranolol
Ciprofloxacin	Sertraline
Clopidogrel	Tetracycline
	Ticlopidine
	Sulfamethoxazole-trimethoprim

May Decrease INR
Barbiturates
Carbamazepine
Cholestyramine
Dicloxacillin (unlike other penicillins)
Griseofulvin
Influenza vaccine
Mercaptopurine
Multivitamins with vitamin K
Nafcillin (unlike other penicillins)
Rifampin
Ritonavir
Sucralfate
Vitamin K in foods
Vitamin K in enteral feeds

Anticoagulation Therapy Guidelines for Orthopedic Patients

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

SUNY Downstate Medical Center

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 values).

INR	Bleeding Present	Recommended Action
> Therapeutic range to < 5.0	No significant bleeding	Lower warfarin dose, **or**
		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; supplement 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.