SENIOR CARE CONSULTANT GROUP

SAMPLE FOR LTC FACILITIES

ANTICOAGULATION GUIDELINES

2007

INDICATION	INR
Orthopedic	
Total Hip and Knee Arthroplasty	1.8-2.5
Hip Fracture	1.8-2.5
Cardiology	
Atrial Fibrillation	2.0-3.0
Cardiomyopathy	2.0-3.0
Myocardial Infarction	2.0-3.0
Bioprosthetic Heart Valve	2.0-3.0
Mechancial Valve Replacement	2.5-3.5
Treatment of Venous Thrombosis	
Deep Vein Thrombosis	2.0-3.0
Pulmonary Embolism	2.0-3.0

INITIAL DOSE OF WARFARIN

Orthopedic for INR range of 1.8-2.5:

Men: 5 mg (7.5 mg if <60 yo or >240 lbs), less if on interacting drugs

Women: 5 mg (**2.5 mg if >80** yo or interacting medications)

All other indications for INR ranges 2.0-3.5:

Men: 5 mg - 7.5 mg (2.5 mg if >80 yo)

Women: 5 mg - 7.5 mg (2.5 mg if > 80 yo)

Consider using larger initial doses in non-ortho patients to assure therapeutic INR within 3-4 days, especially if patient is younger, heavier and has no interacting medications

Consider using smaller initial doses (i.e. 2.5 mg) in certain patients based on indication, age, sex, interacting medications/disease, nutritional status, etc.

SECOND DOSE OF WARFARIN

•Give same dose as day before if <0.2 increase in INR

Day 1	INR 0.99	5 mg
Day 2	INR 1.13	5 mg

If INR increases >0.2 after the first dose, consider decreasing the dose by 25-50% (may indicate patient sensitive to warfarin)

THIRD/ENSUING DOSES OF WARFARIN

•If after two days of the same dose and <0.3 increase in INR, then increase dose

Day 1	INR 1.00	5 mg
Day 2	INR 1.13	5 mg
Day 3	INR 1.21	7.5 mg

•If after two days of the same dose and 0.3-0.5 increase in INR, give same dose

Day 1	INR 0.97	5 mg
Day 2	INR 1.03	5 mg
Day 3	INR 1.35	5 mg

•If >0.5, but <1.5 increase in INR after two days, decrease dose by 25-75%*

Day 1	INR 0.87	5 mg
Day 2	INR 1.12	5 mg
Day 3	INR 1.70	2.5 mg

WHEN TO HOLD WARFARIN

***Consider holding if >1.5 increase in INR in 1 day even if INR does not meet criteria for hold**

Orthopedic for INR range 1.8-2.5

>2.5-2.9	Decrease dose by 25-75%
>3.0	Hold

Cardiology and Other Patients with INR 2-3

>3-3.9	Decrease dose by 25-75%
>4.0	Hold

Cardiology for INR range of 2.5-3.5

>3.5-4.5	Decrease dose by 25-75%
>4.6	Hold

DISCHARGE ORDERS

Recommendations should include appropriate interval to follow-up INR, which usually should not exceed 1 week, and ideally should be 2-3 days for patients initiated in the facility.

DRUG INTERACTIONS

Increase INR

Alcohol
Amiodarone*
Argatroban (see argatroban reference sheet)
Azole antifungals
Cimetidine
Corticosteroids
Macrolides (rarely azithromycin)
Metronidazole*
Omeprazole
Phenytoin (initially)
Propafenone*
Rofecoxib
Tamoxifen*
Thyroid
TMP/SMX*
Strong warfarin potentiation

Possibly/Rarely Increase INR ***(In most cases, should not require initial dose adjustment)***

Acetaminophen (> 2275mg/wk)
Allopurinol
Celecoxib
Glyburide
HMG CoA Reductase Inhibitors
Propoxyphene
Quinidine
Quinolones
Ranitidine
SSRIs (fluoxetine>paroxetine>sertraline)
Tetracyclines
Vitamin E (> 300 IU/day)
Zafirlukast
Zileuton

Decrease INR	Methimazole, PTU
Barbiturates	Phenytoin (> 1 week)
Carbamazepine	Rifampin

Nutritional supplements *(i.e.* Boost, Ensure*)*

Impair absorption (decrease INR)

Calcium supplements
Cholestyramine
Fiber supplements
Sucralfate
Tube feeding-do not hold tube feeding

Herbals that can increase INR

Angelica Root	Garlic
Capsicum	Ginko
Carnitine	Licorice Root
Celery	Papaya Extract
Chamomile	Papain
Danshen Root	Red Clover
Dong Quai	Sweet Clover
Silvia Root	Wintergreen oil

Herbals that can decrease INR

Avocado	Green Tea
Co-enzyme Q_{10}	Psyllium
Ginseng	Rosehip

Herbals that can increase bleeding

Clove	Meadowsweet
Feverfew	Policosanol
Ginger	Turmeric

✔**Herbal list is not all-inclusive.**
✔**Most available herbal info is based on in-vitro data, animal studies, or case reports. Definitive cause-and-effect relationships have not been established. The INR should be closely monitored when any herbal is initiated or discontinued.**

DISEASE-STATE INR EFFECTS

CHF ↑
Diarrhea ↑
Hyperthyroidism ↑
Infection/Fever ↑
Liver disease ↑
Malnutrition ↑
Pain ↑
Chronic alcoholism ↑/↓
Edema ↓
Hypothyroidism ↓
Tobacco use ↓

VITAMIN K_1 PROTOCOL

Standard Reversal: No active bleeding and no surgery planned within 24 hours

1. Hold warfarin
2. INR q am
3. Give Vitamin K_1 as follows:

INR ≥ 9	Vitamin K_1 5 mg PO
INR > 5 and < 9	Vitamin K_1 1-2.5 mg PO
INR ≥ 3 and ≤ 5	No Vitamin K_1
INR < 3	Discontinue protocol

***** If patient has malabsorption disorder, biliary obstruction, or is NPO may give Vitamin K_1 intravenously (consider lower dose).

** Doses of Vit K_1 1 mg can be achieved by mixing 0.1 ml of the parenteral solution in some fluid and giving orally.

Rapid Reversal: **INR ≥ 10 *or* active bleeding *or* surgery/procedure within 24 hours**

1. Hold warfarin
2. INR q 6h
3. If initial INR and subsequent INR is:

INR >10	Vitamin K_1 10 mg IV
INR ≥5 but ≤10	Vitamin K_1 5 mg IV
INR > 1.5 but < 5	Vitamin K_1 2 mg IV
INR ≤ 1.5	Discontinue protocol

4. Consider use of fresh frozen plasma for rapid reversal

- The intramuscular route of vitamin K administration should be avoided due to the possibility of hematoma formation and dermatological reactions.

- There is concern of anaphylaxis with the intravenous route. If chosen, dilute and administer slowly over 30 minutes to minimize anaphylactic reactions.

- Use of high doses of vitamin K (≥10mg) may cause prolonged (up to 1 week) warfarin resistance.