Continuation of Therapy: Warfarin Maintenance Dosing		
Target INR 2 - 3	**Dosing Adjustment**	**Target INR 2.5-3.5**
INR < 1.5	Consider booster dose of 1.5-2 times daily maintenance dose. Consider resumption of prior maintenance dose if factor causing decreased INR is transient, (i.e. missed warfarin doses). If dosage adjustment is needed increase maintenance dose by 10-20%	INR < 2
INR 1.5 - 1.7	Consider booster dose of 1.5-2 times daily maintenance dose. Consider resumption of prior maintenance dose if factor causing decreased INR is transient, (i.e. missed warfarin doses). If dosage adjustment is needed, increase maintenance dose by 5-15%	INR 2-2.3
INR 1.8 - 1.9	No dosage adjustment may be necessary: if the last two INR's were in range, if there is no clear explanation for the INR to be out of range and if in the judgment of the clinician the INR does not represent an increased risk of thromboembolism for the patient. Consider booster dose of 1.5-2 times daily maintenance dose. Consider resumption of prior maintenance dose if factor causing decreased INR is transient, (i.e. missed warfarin doses). If dosage adjustment is needed, increase maintenance dose by 5-10%	INR 2.3-2.4
Target INR 2 - 3	No dosing adjustment needed	**Target** INR 2.5 - 3.5
INR 3.1 - 3.2	No dosage adjustment may be necessary: if the last two INRs were in range, if there is no clear explanation for the INR to be out of range, and if in the judgment of the clinician, the INR does not represent an increased risk of hemorrhage for the patient. Consider continuation of prior maintenance dose if reason for elevated INR is transient (i.e. acute alcohol ingestion). If a dosage adjustment is needed, decrease maintenance dose by 5-10%	INR 3.6 - 3.7
INR 3.3 - 3.4	Consider holding 1 dose. Consider resumption of prior maintenance dose if reason for elevated INR is transient (i.e. acute alcohol ingestion). If a dosage adjustment is needed, decrease maintenance dose by 10-20%	INR 3.8 - 3.9
INR 3.5 - 3.9	Consider holding 1 dose. Consider resumption of prior maintenance dose if reason for elevated INR is transient (i.e. acute alcohol ingestion) If a dosage adjustment is needed, decrease maintenance dose by 5-15%.	INR 4 - 4.4
INR ≥ 4	Hold warfarin until INR < upper limit of target range. Consult provider if warfarin reversal may be indicated Consider resumption of prior maintenance dose if reason for elevated INR is transient (i.e. acute alcohol ingestion). If a dosage adjustment is needed, decrease maintenance dose by 5-15%	INR ≥ 4.5

Chest 2012 Guidelines Warfarin (VKA) reversal

Intravenous Vitamin K works faster than oral vitamin K, but is associated with anaphylactoid reaction in 3/10,000 patients. Low dose Vitamin K reduces an INR of 6-10 to less than 4 in 1.4 days after PO and 24 hours after intravenous. High dose Vitamin K begins reducing INR within 2 hours with a correction to normal generally by 24 hours. Subcutaneous injection of Vitamin K not recommended; effect is delayed and unpredictable.

INR	Recommendation if Rapid Reversal is NOT necessary
4.5-10, no evidence of bleeding	Hold Anticoagulation. Vitamin K not routinely recommended if no evidence of bleeding.
>10, no evidence of bleeding	Hold Anticoagulation and Vitamin K 2.5-5mg PO. May need to repeat Vitamin K dose in 24 to 48 hours

INR	Rapid Reversal Indicated
Elevated, with need for urgent (but not lifesaving) procedure	Hold anticoagulation, give Vitamin K 2.5-5mg PO
Elevated, with non-life-threatening bleeding	Hold anticoagulation, give Vitamin K 5-10mg IV, give FFP (consider Kcentra®)
Elevated, with need for lifesaving procedure	Hold anticoagulation, give Vitamin K 5-10mg IV, give Kcentra®
Elevated, with life-threatening, major bleeding	Hold anticoagulation, give Vitamin K 5-10mg IV, give Kcentra®

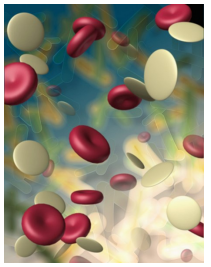
UCHC-JDH Formulary Restricted: **PCC-Kcentra®** is approved for neurosurgery for severe, life-threatening bleeds such as pre-op need for intracranial hemorrhage. Other major bleeding situations other require a HEME/ONC consult for Kcentra® approval. If HEME/ONC attending approves the use of Kcentra ® in the situation he/she must directly communicate to pharmacist the approval, patient name, situation and dose. Doses are rounded according to the table below for ease of dosing calculation and to decrease vial wastage per P&T Committee. More than three vials requires the pharmacy to pool the product (syringe) and not send vials to the floor for preparation.

Administer with vitamin K concurrently. Repeat dosing of Kcentra® is not Recommended.
Kcentra is contraindicated in patients with known anaphylactic or severe systemic reactions to Kcentra®or any of its components (including heparin, Factors II, VII, IX, X, Proteins C and S, Antithrombin III and human albumin). Kcentra® is also contraindicated in patients with DIC.Because Kcentra® contains heparin, it is contraindicated in patients with heparin-induced thrombocytopenia (HIT).

Patient Weight (kg)	**INR 2 - < 4 Dose = 25 units/kg** Kcentra® **Factor IX**			**INR 4 – 6 Dose = 35 units/kg** Kcentra® **Factor IX**			**INR > 6 Dose = 50 units/kg** Kcentra® **Factor IX**		
	Dose in Unit	Volume to Infuse	Infusion Time	Dose in Units	Volume to Infuse	Infusion Time	Dose in Units	Volume to Infuse	Infusion Time
40 – 44	1000	40 mL	5 min	1400	56 mL	7 min	2000	80 mL	10 min
45 – 49	1125	45 mL	6 min	1575	63 mL	8 min	2250	90 mL	12 min
50 – 54	1250	50 mL	7 min	1750	70 mL	9 min	2500	100 mL	13 min
55 – 59	1375	55 mL	7 min	1925	77 mL	10 min	2750	110 mL	14 min
60 – 64	1500	60 mL	8 min	2100	84 mL	11 min	3000	120 mL	15 min
65 – 69	1625	65 mL	9 min	2275	91 mL	12 min	3250	130 mL	17 min
70 – 74	1750	70 mL	9 min	2450	98 mL	13 min	3500	140 mL	18 min
75 – 79	1875	75 mL	10 min	2625	105 mL	14 min	3750	150 mL	19 min
80 – 84	2000	80 mL	10 min	2800	112 mL	14 min	4000	160 mL	20 min
85 – 89	2125	85 mL	11 min	2975	119 mL	15 min	4250	170 mL	22 min
90 – 94	2250	90 mL	12 min	3150	126 mL	16 min	4500	180 mL	23 min
95 – 99	2375	95 mL	12 min	3325	133 mL	17 min	4750	190 mL	24 min
≥ 100 (Max dose)	2500	100 mL	13 min	3500	140 mL	18 min	5000	200 mL	25 min

UConn Health
Department of Pharmacy

Anticoagulation Therapy
Pocket Guide For Pharmacists



Please refer to full Anticoagulation Guidelines on the pharmacy.uchc.edu website for more detailed information.

January 2015, Version II

Initiate Warfarin Target INR Goal of 2 -3			
Day	Warfarin Starting Dose (mg)	INR Value	Warfarin Incr Sensitivity Starting Dose (mg)
Day 1	5 mg	< 1.5	2.5 mg
Day 2	5 mg	< 1.5	2.5 mg
	2.5mg	1.5 – 1.9	1 – 1.5 mg
	1 – 2.5 mg	2 – 2.5	0.5 – 1 mg
	0 mg	> 2.5	0 mg
Day 3	5 – 10 mg	< 1.5	2.5 – 5 mg
	2.5 – 5 mg	1.5 – 1.9	1 – 2.5 mg
	0 – 2.5 mg	2 – 3	0 – 1 mg
	0 mg	> 3	0 mg
Day 4	10 mg	< 1.5	5 mg
	5 – 7.5 mg	1.5 – 1.9	3 – 5 mg
	0 – 5 mg	2 - 3	0 – 2.5 mg
	0 mg	> 3	0 mg
Day 5	10 mg	< 1.5	5 mg
	7.5 – 10 mg	1.5 – 1.9	3 – 5 mg
	0 – 5 mg	2 - 3	0 – 2.5 mg
	0 mg	> 3	0 mg
Day 6	7.5 – 12.5 mg	< 1.5	3 – 7.5 mg
	5 – 10 mg	1.5 – 1.9	2.5 – 5 mg
	0 – 7.5 mg	2 – 3	0 – 4 mg
	0 mg	> 3	0 mg

VTE Prophylaxis Treatment based on UCHC-JDH defined risk factors

Low Risk

●Ambulatory with anticipated LOS ≤ 2 days; age <50 years and NO other risk factors ●OR already on therapeutic anticoagulation	●Ambulate with or without assistance TID

Intermediate/High Risk (most Med/Surg patients)

Orders for mechanical and/or pharmacological prophylaxis are required for all intermediate/high risk patients.

●Congestive heart failure (CHF) ●Acute myocardial infarction (MI) ●Acute infection ●Active inflammation ●Age > 70 years ●ICU admission ●Active cancer ●Previous deep venous thrombosis (DVT) or pulmonary embolism (PE) ●Obesity ●Respiratory failure ●Bed rest ≥ 3 days ●Known thrombophilic condition ●Trauma/surgery within past month ●Acute Ischemic cerebral vascular accident (CVA) ●Orthopedic surgery (Elective Hip/ Knee) ●Fractured hip/pelvis/femur/leg ●Pregnancy ●Hormonal treatment	Pharmacological VTE Prophylaxis ●Enoxaparin 40 mg SC Q24H*¥ ●Enoxaparin 30 mg SC Q24H if CrCl < 30 mL/min¥ ●Heparin 5000 units SC Q8H* ●Heparin 5000 units SC Q12H for patients ≥ 75 years ONLY Mechanical VTE prophylaxis may be used in combination with pharmacologic VTE prophylaxis or alone in those in whom anticoagulation is contraindicated: ●Pneumatic air stocking (PAS) while in bed ●Bilateral knee high compression stockings (Remove TED hose Q8H for skin assessment)

* Higher doses of prophylactic heparin (7500 units TID) or enoxaparin (40mg BID) should be considered in morbidly obese inpatients (Weight >100kg and BMI ≥ 40kg/ m^2.

¥ Administer 12 hours before or after surgery. ***Contraindicated*** with Epidural.

Heparin-Induced Thrombocytopenia (HIT) Risk Assessment

Category		0 points	1 point	2 points
I	Thrombocytopenia (Platelet fall from baseline)	< 30%	30-50%	> 50%
II	Timing of platelet fall (Onset)	< Day 4 OR No recent Heparin	Day 10 OR Timing unclear OR < 1 day with recent heparin (31-100 days ago)	Day 5-10 OR ≤ Day 1 with recent heparin (30 days ago)
III	Thrombosis Other Sequelae	None	●Progressive thrombosis ●Erythematous skin lesion ●Suspected (unproven) thrombosis	●Proven new thrombosis ●Skin necrosis ●Acute systemic reaction after UFH bolus
IV	Other potential causes of thrombocytopenia	Definite	Possible	Not evident
Total Score of HIT Probability		**0-3 Low Risk (< 5% chance)**	**4-5 Intermediate Risk**	**6-8 High Risk (> 80% chance)**

Chest 2012 Thromboembolic Risk Assessment

Risk Stratum	Atrial Fibrillation	Prosthetic Valve	Venous Thromboembolism	Recommend
Low Risk (<5% risk of TE)	$CHADS_2$[a] 0-2 No prior stroke or TIA	Valve Bileaflet aortic valve prosthesis without Atrial fibrillation, and no other risk factors for stroke	Single VTE event greater than 12 months ago and no other risk factors	Suggest no bridging (Grade 2C)
Intermediate Risk (5-10% annual risk of TE)	$CHADS_2$[a] 3-4	Bileaflet aortic valve prosthesis and any of the following: Atrial fibrillation Prior stroke or TIA Hypertension Diabetes Congestive heart failure Age >75	VTE within past 3-12 months Recurrent VTE Active cancer (treated within 6 months) Non-severe thrombophilia (heterozygous factor V Leiden mutation, Heterozygous factor II mutation)	Assess need for bridging based on patient-specific and surgery related factors
High Risk (>10% annual risk of TE)	$CHADS_2$[a] 5-6 Stroke or TIA within 3 months Rheumatic valvular heart disease	Any mitral valve prosthesis Caged-ball or tilting disk aortic valve prosthesis Stroke or TIA within previous six months	Recent VTE within 3 months Severe thrombophilia (protein C, S or antithrombin deficiency, antiphospholipid antibody, or multiple abnormalities)	Suggest bridging

[a] **$CHADS_2$**: 1 point each for presence of **C**HF, **H**ypertension, **A**ge >75, **D**iabetes, and **2** points for prior **S**troke or TIA.

Warfarin Anticoagulation Elective Surgery Bridging Guideline (clinical judgment and individual patient factors should be considered)

Risk Stratum	Recommend
Low Risk	**Pre**: Hold warfarin for 5 days prior to procedure. Check INR 1 day prior, if ≥ 1.5 contact the surgeon for instructions as may need to administer Vitamin K. No enoxaparin bridging necessary.
	Post: Resume warfarin approximately 12-24 hours after surgery and when adequate hemostasis.
Intermediate and High Risk	**Pre**: Hold warfarin for 5 days prior to procedure; enoxaparin SC 1.5mg/kg/day when INR is below the patient's defined therapeutic range. On the day prior to the surgery/procedure, administer 0.75mg/kg
	Post Minor Surgery/Low bleeding risk: Resume enoxaparin 1.5mg/kg/day 24 hours after the procedure
	Post-Surgery/Moderate bleeding risk: Resume enoxaparin 1.5mg/kg/day 48 hours after the procedure
	Post-Surgery/High bleeding risk: Enoxaparin 40mg daily start 24 hours after the procedure
	Post-Surgery/Very high bleeding risk: No post-procedure enoxaparin
	Post-Surgery Warfarin: Resume warfarin approximately 12-24 hours after surgery and when adequate hemostasis. Post procedure enoxaparin orders will be discontinued when patient's INR is within the established therapeutic range on two consecutive days.

Increased Warfarin Sensitivity

Increased INR Response	Increased Bleeding Risk
● Baseline INR ≥ 1.5 ● Age > 65 ● Actual body weight < 45 kg or actual < ideal ● Malnourished/NPO > 3 days ● Hypoalbuminemia < 2 g/dL ● Chronic diarrhea ● Significant drug interactions ● Decompensated heart failure ● Asian race ● Malignancy	● Current antiplatelet therapy ● Thrombocytopenia: platelet < 75 K/uL ● Significant hepatic disease: cirrhosis or total bilirubin > 2.4mg/dL ● Alcohol abuse history ● End stage renal disease ● GI bleed within past 30 days ● Surgery within past 2 weeks ● Intracranial bleed within past 30 days

Initiate Warfarin Target INR Goal of 2.5 -3.5

Day	Warfarin Starting Dose (mg)	INR Value	Warfarin Incr. Sensitivity Starting Dose (mg)
Day 1	5 mg	-	2.5 mg
Day 2	5 mg	< 1.5	2.5 mg
	2.5 mg	1.5 – 1.9	1 – 1.5 mg
	2.5 mg	2 – 2.5	1 – 1.5 mg
	1 – 2.5 mg	2.5 – 3	0.5 – 1 mg
	0.5 – 1 mg	3 – 3.5	0.5 mg
	0 mg	> 3.5	0 mg
Day 3	5 – 10 mg	< 1.5	2.5 – 5 mg
	2.5 – 5 mg	1.5 – 1.9	1 – 2.5 mg
	2.5 mg	2 – 2.5	1.25 mg
	2.5 mg	2.5 – 3	1.25 mg
	1 mg	3 – 3.5	0.5 mg
	0 mg	> 3.5	0 mg
Day 4	10 mg	< 1.5	5 mg
	5 – 7.5 mg	1.5 – 1.9	2.5 – 4 mg
	2.5 – 5 mg	2 – 2.5	1.25 – 2.5 mg
	2.5 – 5 mg	2.5 – 3.5	1 – 2.5 mg
	0 mg	> 3.5	0 mg
Day 5	10 mg	< 1.5	5 mg
	7.5 – 10 mg	1.5 – 1.9	3 – 5 mg
	0 – 5 mg	2 – 2.5	2.5 mg
	2.5 – 5 mg	2.5 – 3.5	1.25 – 2.5 mg
	0 mg	> 3.5	0 mg
Day 6	7.5 – 12.5 mg	< 1.5	4 - 6 mg
	5 – 10 mg	1.5 – 1.9	2.5 - 5 mg
	5 – 7.5 mg	2 – 2.5	2.5 - 4 mg
	2.5 – 7.5 mg	2.5 – 3.5	1.25 - 4 mg
	0 mg	> 3.5	0 mg