

MANAGING ORAL ANTICOAGULATION in the ELDERLY		
Initiation of Therapy		<ul style="list-style-type: none"> Obtain baseline INR (and APTT if on heparin). Determine if drug interactions with warfarin are present. Initial dosage should be an estimate of the average daily dosage of warfarin, usually less than 5 mg daily in the elderly due to increased pharmacodynamic activity. Discontinue heparin, if being administered concurrently, after the INR has been in the therapeutic range for at least two measurements taken ≥ 24 hours apart.
Monitoring of Therapy		<ul style="list-style-type: none"> Monitor INR daily until stable; a therapeutic INR is usually achieved in 5 to 7 days. The INR can be monitored 2-3 times weekly for 1-2 weeks, then weekly for one month, and monthly thereafter. More frequent monitoring is required in some patients, particularly during changes in medications, particularly antibiotics, and changes in diet.
Managing High INR Values	INR 3.0 – 5.0 No significant bleeding	<ul style="list-style-type: none"> Withhold one dose or lower the dose Resume therapy when INR in desired range
	INR 5.0 – 9.0 No significant bleeding	<ul style="list-style-type: none"> Withhold 1-2 doses, resume when INR in desired range Consider Vitamin K1 (1-2.5 mg p.o.), especially if increased bleeding risk If urgent correction required, give Vitamin K1 (2-4 mg p.o.); if INR remains high give additional Vitamin K1 (1-2 mg p.o.) <p><i>Grade 2C evidence as compared with no treatment</i></p>
	INR > 9.0 No significant bleeding	<ul style="list-style-type: none"> Withhold warfarin; give Vitamin K1 (3-5 mg p.o.) Closely monitor INR; if not substantially reduced in 24-48 hrs., may require additional Vitamin K1.
	Significant bleeding	<ul style="list-style-type: none"> Discontinue warfarin Administer Vitamin K1 (10 mg slow IV infusion); supplemented with fresh plasma or prothrombin complex concentrate, depending on urgency; Vitamin K1 injections can be repeated every 12 hours. (<i>grade 2C</i>)
Managing oral anticoagulation During invasive procedures	Low risk for thromboembolism <ul style="list-style-type: none"> No VTE > 3 mos. AF without history of stroke Bileaflet mechanical valve in the aortic position 	<ul style="list-style-type: none"> Stop warfarin about 4 days prior to procedure Consider short term LMWH or LDUH when INR is reduced if procedure increases risk for thrombosis Resume warfarin following
	Intermediate risk for Thromboembolism	<ul style="list-style-type: none"> Stop warfarin about 4 days prior to procedure and allow INR to return to normal range Administer LMWH or LDUH (5000 IU SC) about 2 days prior to procedure; and following the procedure Resume warfarin and discontinue LDUH when INR is therapeutic for ≥ 48 hours
	High risk for thromboembolism <ul style="list-style-type: none"> VTE in < 3 months History of VTE Mechanical cardiac valve in mitral position Old model cardiac valve (ball/cage) 	<ul style="list-style-type: none"> Stop warfarin about 4 days prior to procedure and allow INR to fall to normal range Administer full dose heparin (SC or IV) as INR falls, and discontinue about 5 hours prior to procedure; or alternately administer LMWH until 12 to 24 hours prior to the procedure Resume heparin or LMWH and warfarin after procedure and discontinue LDUH when INR is therapeutic for ≥ 48 hours



CURRENT GUIDELINES FOR PRACTICE Oral Anticoagulation for Older Adults

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ORAL ANTICOAGULANT GUIDELINES FOR THE CARE OF OLDER ADULTS*

VENOUS THROMBOEMBOLISM

DISORDER	INR Goal, range	CLINICAL COMMENTS
Surgical prophylaxis for High Risk Patients	2.5 (2.0 – 3.0)	In older adults (> 60 years), undergoing general, gynecologic, urologic surgery, perioperative prophylaxis with LDUH, LMWH, IPC device, ES, is preferred over oral warfarin (<i>grade 1A-C</i>). For major orthopedic surgery, THR, TKR, hip fracture surgery, LMWH is preferred, but adjusted dose oral warfarin may be used alternatively to LMWH, adjusted dose heparin. (<i>grade 1A</i>), or IPC device (<i>grade 1B</i>). Anticoagulants are given preoperatively or immediately postoperatively, and continued at least 7-10 days postoperatively.
Deep Venous Thrombosis (DVT) or Pulmonary Embolism (PE)	2.5 (2.0 – 3.0)	Oral warfarin should be initiated with LMWH on day 1; discontinue LMWH after ≥ 4 to 5 days of combined therapy when INR is >2.0 . Duration: <ul style="list-style-type: none"> ■ ≥ 6 to 12 weeks for symptomatic isolated calf thrombosis (<i>grade 1A</i>) ■ ≥ 3 months for first episode with reversible or time-limited risk factor (<i>grade 1A</i>) ■ ≥ 6 months for idiopathic first episode (<i>grade 1A</i>) ■ ≥ 12 months for recurrent idiopathic or continuing risk factor (<i>grade 1C</i>) Therapy should be individualized; for many patients, lifelong therapy is indicated. Time-limited risk factors include surgery, trauma, immobilization, estrogen use. Continuing risk factors include cancer, antithrombin deficiency, anticardiolipin antibody syndrome. IVC filters recommended for placement with proximal vein thrombosis or PE or with high risk for these conditions when anticoagulant therapy is contraindicated or has resulted in a complication (<i>grade 1C+</i>) or with recurrent VTE despite adequate anticoagulation, with chronic recurrent embolism and pulmonary hypertension, and with surgical pulmonary embolectomy, (<i>grade 1C</i>) with continued warfarin.

PREVENTION OF SYSTEMIC EMBOLISM

Atrial fibrillation (AF)	2.5 (2.0 – 3.0)	For patients with any high risk factor or more than one moderate risk factor, warfarin is recommended. For patients with one moderate risk factor, aspirin 325 mg/d or warfarin is recommended. High risk factors include age ≥ 75 ; previous TIA, SE, or stroke, poor LV systolic function, hypertension,; rheumatic mitral valve disease; or prosthetic heart valve (<i>grade 1A</i>). Moderate risk factors include age 65 – 75, diabetes mellitus, CAD, with preserved LV function. (<i>grade 1A</i>)
Cardioversion Atrial Fibrillation or Atrial Flutter	2.5 (2.0 – 3.0)	Patients with AF for < 48 hours should be offered anticoagulation during the pericardioversion period (<i>grade 2C</i>). If > 48 hrs or indeterminate, anticoagulate as below: Duration: 3 weeks prior and ≥ 4 weeks after procedure (<i>grade 1C+</i>); or alternatively, if < 48 hrs and TEE is negative for thrombus, anticoagulation until NSR is maintained ≥ 4 weeks (<i>grade 1C</i>).
Acute Myocardial Infarction		Anticoagulate for ≤ 3 months in patients who may or may not have received thrombolytic therapy and are at high risk for systemic embolism or VTE (anterior Q-wave infarction, severe LV dysfunction, congestive heart failure, history of SE or PE, 2D-echo evidence of mural thrombus, [<i>grade 2A</i>] or AF [<i>grade 1A</i>]); indefinitely with AF
Rheumatic Mitral Valve Disease (MS, MR)	2.5 (2.0 – 3.0)	Indefinite treatment with history of SE or AF (<i>grade 1C+</i>). Consideration of long-term warfarin therapy based on risk factors for SE (LA size, patient's age, hemodynamic severity) (<i>grade 2C</i>). Oral anticoagulation for mitral valve prolapse recommended when a documented SE or recurrent TIA has occurred despite aspirin (<i>grade 1C</i>).
Aortic Valve and Aortic Arch Disorders		Oral warfarin is only recommended for mobile aortic atheroma and aortic plaque > 4 mm by TEE (<i>grade 2C</i>).
Prosthetic Heart Valves: Any bileaflet or tilting disk in aortic position	2.5 (2.0 – 3.0) (<i>grade 1A</i>)	St. Jude Medical (<i>grade 1A</i>) or CarboMedics bileaflet, or Medtronic-Hall tilting disk (<i>grade 1C</i>); left atrium normal size, NSR
Prosthetic Heart Valves: Tilting disk valve or bileaflet mechanical valve in mitral position	3.0 (2.5 – 3.5)	Alternatively, INR 2.5 (2.0 – 3.0) and aspirin therapy (80-100 mg/d) (<i>grade 2C</i>)
Prosthetic Heart Valves: Any mechanical aortic with AF	3.0 (2.5 – 3.5)	Alternatively, INR 2.5 (2.0 – 3.0) and aspirin therapy (80-100 mg/d) (<i>grade 2C</i>)
Prosthetic Heart Valves: Caged ball or caged disk valve	3.0 (2.5 – 3.5)	Alternatively, INR 2.5 (2.0 – 3.0) and aspirin therapy (80-100 mg/d) (<i>grade 2C</i>)
Prosthetic Heart Valves: Additional risk factors or Systemic embolism despite adequate therapy with oral anticoagulants	3.0 (2.5 – 3.5)	INR 2.5 (2.0 – 3.0) and aspirin therapy (80-100 mg/d) (<i>grade 1C+</i>)

Abbreviations:

AF	Atrial fibrillation	LMWH	Low molecular weight heparin	SE	Systemic Embolism
CAD	Coronary artery disease	LA	Left Atrial	TEE	Transesophageal echocardiogram
ES	Elastic Stockings	LV	Left ventricular	TIA	Transient ischemic attack
IPC	Intermittent Pneumatic Compression	NSR	Normal sinus rhythm	THR	Total hip replacement
LDUH	Low dose unfractionated heparin	PE	Pulmonary embolism	TKR	Total knee replacement

*Modified from Chest 2001;119/1(Suppl.) by Laurie G. Jacobs, MD for the Clinical Practice Committee of the American Geriatrics Society. For further information, visit the AGS web-site (www.americangeriatrics.org)

This pocket card has been reviewed and approved by the Society of Geriatric Cardiology.

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