

STROKE VTE SAFETY RECOMMENDATIONS: APPLIES TO ISCHEMIC AND HEMORRHAGIC STROKE

STEP 1 Admission/Transition of Care (Risk Factor Assessment):

Conduct stroke VTE risk factor assessment and document on all admitted patients with a stroke or rule out stroke diagnosis. Factors to consider, include:

- Personal, family history, or diagnosis of VTE
- Thrombophilia, history of hypercoagulopathy, or hypercoagulable state
- Immobility/bedrest greater than 24 hours
- Obesity BMI >30 kg/M²
- Smoking
- Active cancer (treatment ongoing, treatment within past 6 months, palliative)
- Paralysis, paresis or recent plaster immobilization of the lower extremities
- Major surgery within four weeks
- Localized tenderness along the distribution of the deep venous system, entire leg swollen, calf swelling 3 cm > asymptomatic side (measured 10 cm below tibial tuberosity), pitting edema confined to the symptomatic leg, or collateral superficial veins (non-varicose)
- Acute brain injury associated with trauma
- Current infection and associated treatment
- Pneumonia
- Heart failure, recent MI, or mechanical heart valve
- Lupus, autoimmune disease, inflammatory bowel disease
- Long distance air travel (> 6 hours)
- Current oral contraceptive or estrogen/testosterone supplement use

Documented VTE then consider:

- Consult hematologist for any potential anticoagulation addition or adjustment,
- Consult vascular surgeon or interventional radiologist for inferior vena cava placement or evaluation.

For Stroke Core Measures: mechanical and pharmacological therapy is required, unless documented contraindication

- Ambulation progression, as prescribed by health provider

- Mechanical prophylaxis initiated:

- Intermittent pneumatic compression (IPC) device (thigh length, not knee length)
- Other compression devices considered:
 - anti-embolism stockings;
 - venous foot pump (VFP)

Contra-indications to VFP/IPC

Dermatitis
Leg ulcers
Severe edema
Severe peripheral vascular disease
Congestive heart failure

- Mechanical prophylaxis ongoing:

- Wound care team advised of patient's use
- Ensure on patient
- Ensure properly measured, fitted, worn, and machine is on
 - Minimally 18-20 hours per day (removed for 30 minutes maximum)
 - Skin inspection minimally every 8 hrs
 - IPC/VFP removed for ambulation

- Patient provided with information on proper use wearing, and able to verbalize understanding.

Contra-indications to Anticoagulant Use

BLEEDING RISK contraindications

A patient at higher bleeding risk is assessed by having 3 or more of the following risk factors:

- Age > 65 years.
- Previous history bleed or predisposition to bleeding (e.g. diverticulitis).
- Uncontrolled hypertension.
- Severe renal impairment (i.e. serum creatinine > 200µmol/L, GFR < 30 mL/min/1.73 m² or on dialysis).
- Acute hepatic impairment (e.g. bilirubin > 2x ULN + LFTS > 3x ULN), chronic liver disease (e.g.cirrhosis).
- Low platelet count < 80 x 10⁹/L or a thrombocytopenia or anaemia of undiagnosed cause.
- On concomitant drugs associated with an increased bleeding risk e.g. SSRIs, oral steroids, NSAIDs, methotrexate or other immune-suppressant agents.

ABSOLUTE contraindications

- Known large oesophageal varices.
- Significant thrombocytopenia (platelet count < 50 x 10⁹/L) - *refer to haematologist*.
- Within 72 hours of major surgery w/ risk of severe bleeding - *defer & reassess risk postoperatively*.
- Previously documented hypersensitivity to either the drug or excipients – *consider cardiology opinion*.
- Acute clinically significant bleed - defer & re-assess stroke versus bleeding risk within 3 months.
- Decompensated liver disease or deranged baseline clotting screen (INR > 1.5) – *refer to Gastroenterology / Hepatology*. Contraindication applies to oral anticoagulants only.
- Pregnancy or within 48 hours post partum - seek urgent haematological advice. Contraindication applies to oral anticoagulants only.
- Severe renal impairment (GFR < 30 mL/min/1.73 m² or on dialysis). Contraindication applies to dabigatran only.

RELATIVE contraindications

- Previous history intracranial haemorrhage - as some AF patients especially those considered at higher stroke risk (i.e. CHADS2 score ≥ 3) may benefit from anti-thrombotic therapy, *seek the opinion of a stroke specialist*.
- Recent major extracranial bleed within the last 6 months where the cause has not been identified or treated – *decision for oral anti-thrombotic therapy should be deferred*.
- Recent documented peptic ulcer (PU) within last 3 months– *decision for oral anti-thrombotic therapy should be deferred until treatment for PU completed*. In all cases with history PU give PPI cover whilst on anti-thrombotic.
- Recent history recurrent iatrogenic falls in patient at higher bleeding risk.

A risk of falls is not a contraindication to initiating oral anticoagulation

(e.g. a patient with an annual stroke risk of 5% (CHADS2 score 2-3) would need to fall 295 times for fall risk to outweigh stroke reduction benefit of warfarin).

- Dementia or marked cognitive impairment with poor medicines compliance and no access to carer support.
- Chronic alcohol abuse – especially if associated with binge drinking.

Recommended VTE Prophylaxis

For Stroke Core Measures: mechanical and pharmacological therapy is required, unless documented contraindication

For ischemic stroke, anticoagulant therapy ordered and initiated, as prescribed by health provider, for VTE prevention on day of admission in ischemic stroke and between 72-96 hours after admission in intracerebral hemorrhage

- Fondaparinux sodium
- Low molecular weight heparin (LMWH)
- Low-dose unfractionated heparin (UFH) (for patients with renal failure)
- Other anticoagulant agent (specify _____)

- Discharge planning:
 - Discussed with patient/family
 - Collaboration and recommendations with patient's case manager and/or transition care specialist (discharge coach) for rehabilitation transition potential and patient mobility/functional goals
 - Discussion with physical therapist for current and future mobility/functional goals
 - Anticipated discharge date determined
 - Evaluate patient for mechanical prophylaxis for home use
 - Order continued home mechanical prophylaxis use at time of discharge
 - Continue home use post discharge unless specified differently by the clinician

Structured Clinical Questions

Population	Intervention(s)	Comparator	Outcome	Methodology
Hospitalized acutely ill medical patients	Mechanical prophylaxis (GCS, IPC, IVC filter) and/or pharmacologic prophylaxis (ASA, LDUH, LMWH, fondaparinux, VKA, oral DTI, oral direct Xa inhibitors)	No treatment, placebo, mechanical prophylaxis, and/or pharmacologic prophylaxis	Symptomatic DVT and PE, death, major bleeding events, mechanical prophylaxis complications	RCTs
	LDUH bid	LDUH bid		
	Extended-duration pharmacologic prophylaxis, after initial short-duration prophylaxis	Short-duration prophylaxis		
All patients admitted to a critical care unit	Any screening for asymptomatic VTE with ultrasound	No screening		
	Rostine screening with ultrasound for asymptomatic VTE	No screening	Symptomatic DVT, PE, death, major bleeding events	RCTs and observational studies
Patients with cancer	LMWH, LDUH	No treatment, placebo, mechanical prophylaxis, and/or pharmacologic prophylaxis	Symptomatic DVT, PE, death, major bleeding events, mechanical prophylaxis complications	RCTs and observational studies
	Mechanical prophylaxis (GCS) and/or pharmacologic prophylaxis (ASA, LDUH, LMWH, fondaparinux, VKA, oral DTI, oral direct Xa inhibitors)	No treatment, placebo, mechanical prophylaxis, and/or pharmacologic prophylaxis	Symptomatic DVT, PE, death, major bleeding events, mechanical prophylaxis complications	RCTs and observational studies
Receiving cancer treatment in outpatient setting	Pharmacologic prophylaxis (ASA, LDUH, LMWH, fondaparinux, VKA, oral DTI, oral direct Xa inhibitors)	No treatment, placebo, or pharmacologic prophylaxis	Symptomatic DVT, PE, death, major bleeding events, catheter failure	RCTs and observational studies
With indwelling central venous catheters	Mechanical prophylaxis (GCS) and/or pharmacologic prophylaxis (ASA, LDUH, LMWH, fondaparinux, VKA, oral DTI, oral direct Xa inhibitors)	No treatment, placebo, mechanical prophylaxis, and/or pharmacologic prophylaxis	Symptomatic DVT, PE, death, major bleeding events, mechanical prophylaxis complications	RCTs and observational studies
Chronically immobilized patients (e.g. nursing home or rehab residents, immobilized persons living at home)	GCS, LMWH, ASA	No treatment, placebo, mechanical prophylaxis, and/or pharmacologic prophylaxis	Symptomatic DVT, PE, death, major bleeding events	RCTs and observational studies
Long-distance travelers	Prognostic factors associated with risk of VTE	N/A	Symptomatic DVT and PE, death from PE	RCTs and observational studies
All patients	Prognostic factors associated with risk of bleeding	N/A	Major bleeding events, death from bleeding	RCTs and observational studies
Asymptomatic persons with thrombophilia (inherited thrombophilia, LAC, APLA)	Mechanical prophylaxis (GCS) and/or pharmacologic prophylaxis (ASA, LDUH, LMWH, VKA)	No treatment or placebo	Symptomatic DVT, PE, death, major bleeding events	RCTs and observational studies
Asymptomatic persons (ie, no previous VTE)	Stains	No treatment or placebo	Symptomatic DVT, PE, death	RCTs and observational studies

For tradeoff of benefits and harms, only symptomatic VTE events are considered.

APLA = antiphospholipid antibodies; ASA = acetylsalicylic acid; DTI = direct thrombin inhibitor; GCS = Graduated compression stockings; IPC = intermittent pneumatic compression; IVC = inferior vena cava; LAC = lupus anticoagulant; LDUH = low-dose unfractionated heparin; LMWH = low-molecular-weight heparin; PE = pulmonary embolism; RCT = randomized controlled trial; VKA = vitamin K antagonist.

STEP 3

Patient VTE Risk Factor Reassessment

- Risk factors reassessment conducted and documented:
 - Prior to any surgical or procedural intervention
 - Change in patient's condition
 - Minimally once every 24 hours
- Mechanical prophylaxis ongoing:
 - Skin examination (wound care team consulted, if necessary), inspection care plan and treatment recommendations
 - Ensure on patient
 - Ensure properly measured, fitted and worn:
 - Minimally 18- 20 hours per day (removed for 30 minutes maximum)
 - Skin inspection per wound care team protocol or inspected minimally every 8 hrs
 - IPC/VFP removed for ambulation
 - Patient provided with information on proper use and wearing of all mechanical devices and able to read back to caregiver
- Pharmacological prophylaxis continued as prescribed
- Ambulation progression, as prescribed by health provider
- Discharge planning:
 - Discussed with patient/family/
 - Collaboration & recommendations with patient's case manager and/or transition care specialist (discharge coach) for rehabilitation transition potential and patient mobility/functional goals
 - Discussion with physical therapist for current and future mobility / functional goals
 - Anticipated discharge date determined
 - Evaluate patient for mechanical prophylaxis for home use
 - Order continued home mechanical prophylaxis use at time of discharge
 - Continue home use post discharge unless specified differently by the clinician

STEP 4

Patient Discharge or Transition to Rehab

To reduce readmissions and increase better health outcomes, the discharge or transfer to rehabilitation of all stroke patients should be planned. Health professionals should ensure patients understand the role of ordering physician-prescribed pharmacological prophylaxis and of wearing thigh-length compression IPC and stockings to prevent further stroke/VTE incidents are essential.

- Discharge instructions include:
 - Healthcare provider contact information
 - Signs and symptoms of DVT and PE
 - Evaluate patient for home use of:
 - Intermittent pneumatic compression (IPC) thigh length
 - Anti-embolism stockings
 - Venous foot pump
- Discharge instructions:
 - Reviewed with patient and read back
 - Received by patient
- Patient understands DVT/PE risk factors and how to prevent at home
 - Follow up appointment made
 - If immobility or bedrest required:
 - Healthcare provider orders completed, including:
 - Evaluated patient for home use of:
 - Mechanical prophylaxis
 - Length of mechanical prophylaxis treatment
 - Durable medical equipment unit notified of start date of IPC/VFP treatment
- Patient provided with information on:
 - Purpose of mechanical prophylaxis
 - Proper use and wearing
 - Importance on maintaining use at home until MD discontinues
 - Removed for ambulation and skin inspections (every 8 hrs)
 - Worn minimally 18- 20 hours per day (removed for 30 minutes maximum)