

American Society of Hematology Guidelines for Management of Venous Thromboembolism: Prevention of Venous Thromboembolism in Surgical Hospitalized Patients

Question 19: Characteristics of included studies with information regarding use of mechanical prophylaxis and type of pharmacological agents

Study, Year	n	Population description	Type of neurosurgery	Pharmacological thromboprophylaxis	Co-interventions	Route, doses, and time of pharmacological thromboprophylaxis	Time to follow-up	DVT diagnostic technique	Outcomes assessed
<i>Randomized controlled trials</i>									
Agnelli, 1998(21)	307*	Patients 18 years of age or older	Elective cranial or spinal surgery	LMWH (Enoxaparin)	Thigh-length TED compression stocking in all patients	Subcutaneous injections, 40 mg per day for 8±1 days	60 days	Ultrasonography and venography in case of positive ultrasonography.	M, PE, proximal DVT, distal DVT, MB
Constantini, 2001 (22)	103*	Patients over 40 years of age	Craniotomy for brain tumor removal	UFH	No reported	Subcutaneous injections, 5000 units every 12 hours for 7 days or until full ambulation	No reported	No reported**	M, MB, RO
Dickinson, 1998 *** (23)	66*	Patients 18 years of age or older with a diagnosis of an intracranial neoplasm	Craniotomy or stereotactic biopsy	LMWH (Enoxaparin)	Thigh-high TED compression stocking in all patients all patients only before randomization	Subcutaneous injections, 30 mg every 12 hours day until hospital discharge from neurosurgery service	No reported	Duplex ultrasonographic	M, MB
Gruber, 1984(24)	50*	Adult patients undergoing lumbar disc operations	Herniated lumbar disc operations	Heparin-DHE	No reported	Subcutaneous injections, 2500 IU-0.5 mg every 12 hours for at least 7 days or until hospital discharge	No reported	Phlebogram, plethysmography, Doppler ultrasound or an ¹²⁵ I fibrinogen test	PE, MB
Hamidi, 2015(25)	89*	Patients aged 18 to 75 years	Elective instrumental spinal surgery	LMWH (Enoxaparin)	Compression stocking in all patients	Subcutaneous injections, 40 mg per day within 12 hours before the surgery	2 weeks and 8 months after surgery	Compression doppler ultrasonography	M, MB, RO
Nurmohamed, 1996 (12)	485*	Patients 18 years of age or older	Craniotomy or spinal column surgery for a tumor or injury	LMWH (Nadroparin calcium)	TED compression stocking in all patients	Subcutaneous injections, 7,500 anti-factor Xa per day for 10 days or until hospital discharge	56 days after surgery	B-mode compression ultrasonography and venogram in case of	M, proximal DVT, MB

								ultrasonography positive	
Rokito, 1996 *** (13)	110*	Patients 18 years of age or older	Major reconstructive spinal surgery	Warfarin (Coumadin)	Thigh-high TED compression stocking in all patients	10 mg before surgery and doses were adjusted accordingly to prothrombin time	1 year	Duplex ultrasonography and venography in case of ultrasonography positive	PE, MB
Non-randomized studies									
Bauman, 2009 (26)	254	Patients with movement disorders (Parkinson disease, essential tremor, dystonia)	Deep brain stimulation (DBS) surgery	UFH	Compression stocking in all patients and pneumatic compression boots postoperatively	Subcutaneous injections, 50 mg before surgery and 50 mg every 12 hours after surgery. Duration of pharmacological thromboprophylaxis no reported	No reported	Doppler ultrasonography	M, PE, MB
Dermody, 2011 (16)	174	Neurosurgical patients who underwent screening with weekly VDUS of the bilateral lower extremities	Endovascular coiling or clipping, craniotomy, stereotactic biopsy, spine surgery, trans sphenoidal surgery	UFH or LMWH (Enoxaparin)	Mechanical prophylaxis	UFH: 5000 two or three times daily Enoxaparin: no reported	6 months	Venous duplex ultrasound	MB
Hacker, 2012(27)	522	Neurosurgical and head trauma patients	Cervical spinal cord decompression, cervical laminectomy, craniotomy/craniectomy, decompressive laminectomy, nasal sinuses surgery	UFH	Lower extremity compression boots	Subcutaneous injections, 5000 IU every 8 hours until hospital discharge	Until death or until discharged from the hospital	Ultrasound evaluation	M, PE, MB
<p>* Number of patients randomized ** Authors reported DVT only by clinical evidence *** Three-arm RCT † Reported as proximal or distal DVT ‡ Findings were reported qualitatively ASCI: acute spinal cord injury; DHE: dihydroergotamine; DVT: deep venous thrombosis; LMWH: low molecular weight heparin; M: mortality; MB: major bleeding; PE: pulmonary embolism; RO: reoperation; SCD: sequential compression device; TED: thrombosis embolic deterrent; UFH: unfractionated heparin; VDUS: venous duplex ultrasound.</p>									