

DVT
[created by Paul Young 02/10/07]

- Factors present before ICU admission
- Recent surgery
 - Trauma, burns
 - Malignancy and its treatment
 - Sepsis
 - Immobilization/bed rest, stroke, spinal cord injury
 - Increasing age
 - Heart/respiratory failure
 - Previous VTE
 - Pregnancy/puerperium
 - Estrogens
- Additional factors acquired in ICU
- Central venous lines
 - Sepsis
 - Pharmacologic sedation, paralysis
 - Mechanical ventilation

- The vast majority of patients admitted to a critical care unit have a major risk factor for VTE, and most have multiple risk factors.

risk factors

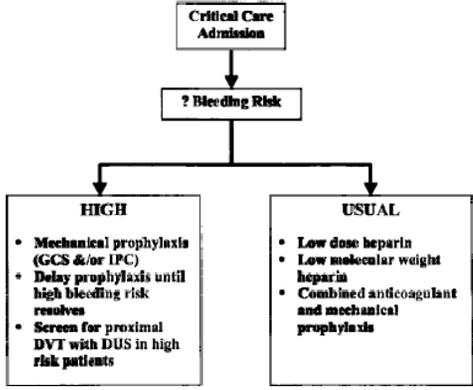
epidemiology

- deep-vein thrombosis (DVT) has an estimated annual incidence of 67 per 100 000 among the general populations
- despite adequate therapy, 1% to 8% of patients in whom pulmonary embolism develops will die
- others will experience long-term complications such as:
 - (i) postphlebitic syndrome (40%)
 - (ii) chronic thromboembolic pulmonary hypertension (4%)
- Among patients who died while in the ICU, PE has been reported in 7 to 27% (mean, 13%) of postmortem examinations, and PE was thought to have caused or contributed to death in 0 to 12% (mean, 3%).
- A clinical suspicion of PE was present in only 30% of these before death.
- among four prospective studies the DVT rates varied between 13% and 31% in critically ill patients who did not receive prophylaxis. Although the clinical consequences of asymptomatic DVT detected by routine screening are uncertain, a recent study showed that patients documented to have DVT by Doppler ultrasound had a significantly greater frequency of subsequent PE during their hospitalization (11.5% vs 0%, $p < 0.01$). Furthermore, even small PE may be poorly tolerated by critically ill patients, many of whom have reduced cardio-respiratory reserve.

Source	ICU Setting	Design	DVT Screening Test	Patients, No.	DVT, %
Moser et al ⁹ (1981)	Respiratory ICU	Prospective cohort	Fg LS for 3-6 d	23	13
Cade ²¹ (1982)	General ICU	Blinded RCT	Fg LS for 4-10 d	Approximately 60	29
Kapoor et al ²² (1999)	Medical ICU	Blinded RCT	Serial duplex ultrasound	390	31
Fraisse et al ²⁸ (2000)	Ventilated COPD	Blinded multicenter RCT	Venography	85	28

*Adapted from Geerts et al⁴ with permission. Includes studies in which no prophylaxis was administered to critical care unit patients and routine screening with objective diagnostic tests was used. Fg LS = ¹²⁵I-fibrinogen leg scanning; RCT = randomized clinical trial.

suggested approach



DVT prophylaxis in critical illness

Source	Method of Diagnosis	Intervention		DVT, No./Total Patients (%)	
		Control	Experimental	Control	Experimental
Cade ²¹ (1982)	Fg LS for 4-10 d	Placebo	Heparin, 5,000 U SC bid	NR/NR (29)	NR/NR (13)
Kapoor et al ²² (1999)	DUS on admission and every 3 d	Placebo	Heparin, 5,000 U SC bid	122/390 (31)	44/401 (11)
Fraisse et al ²⁸ (2000)	Venography before day 21	Placebo	Nadroparin, approximately 70 AXa U/kg SC qd	24/85 (28)	13/84 (15)

*Adapted from Geerts et al⁴ with permission. Includes randomized trials in which routine screening with an objective diagnostic test for DVT was used. AXa = anti-factor Xa; DUS = duplex ultrasonography; NR = not reported; SC = subcutaneously; see Table 2 for expansion of other abbreviation.

One study compared strategies to improve thromboprophylaxis use among 1,827 patients in three similar critical care units. Strategies to improve compliance with DVT prophylaxis:

- Appropriate thromboprophylaxis was used in 38% of patients in the ICU in which no special compliance intervention was used, in 62% of patients in the unit in which education about DVT prophylaxis was provided to physicians, and in 97% of the patients in the third ICU in which prophylaxis education was combined with mandatory computer order entry ($p < 0.01$ for all comparisons).