J.31 Major trauma

Study	[Carter Chiasson 2009[175]]			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Economic analysis: CUA (health outcome: QALYs) **Study design:** Decision analytic model **Approach to analysis:** A Markov analysis using weekly cycles over lifetime (30 years) time horizon. **Perspective:** Canadian health care purchaser. **Time horizon:** lifetime **Treatment effect duration:**[(a)] 2 weeks **Discounting:** Costs: 5% ; Outcomes: 5%	**Population:** Adult (>/= 15 years)Trauma patients with severe injuries admitted to the ICU who were believed to have a contraindication to pharmacological VTE prophylaxis for up to 2 weeks because of a risk of major bleeding. **Cohort settings:** Start age: 39.3 years Male: 76% **Intervention 1:** Pneumatic compression devices (IPCD) and expectant management alone during the first 2 weeks. **Intervention 2: (results not reported here)**	**Total costs (mean per patient):** Intervention 1: £35,571 Intervention 3: £36,529 Incremental (3−1): £975 (95% CI: NR; p=NR) **Currency & cost year:** 2007 Canadian dollars (presented here as 2007 UK pounds[(b)]) **Cost components incorporated:** Intervention costs (including VCF insertion) Hospital stay Readmissions Management of adverse events (mainly major bleeding) DVT and VTE diagnosis and treatment	**QALYs (mean per patient):** Intervention 1: 6.9 Intervention 3: 6.9 Incremental (3−1): 0.0 (95% CI: NR; p=NR)	**ICER (Intervention 3 versus Intervention 1):** N/A [VCF more costly and equally effective] 95% CI: NR Probability Intervention 2 cost-effective (£20K/30K threshold): NR **Analysis of uncertainty:** A wide range of one-way sensitivity analyses was undertaken including changing the following parameters: -risk of DVT -risk of PE for patient with DVT -risk of mortality associated with PE -risk of proximal DVT after insertion of VCF -inclusion of the cost of VCF removal for all patients who had no VTE at discharge. None of the SAs changed the conclusion from the base case analysis.

	IPCD as well as weekly Serial Doppler ultrasound (SDU) screening for the duration of hospitalisation beginning in the first week of ICU admission. **Intervention 3:** Prophylactic insertion of vena-cava filter (VCF).			
Data sources				
Health outcomes: Baseline risks of proximal DVT and PE were based on published data from observational cohort study and a randomised trial. Relative efficacy of VCF was based on data from single RCT identified through a systematic review of the literature. **Quality-of-life weights:** Not reported. **Cost sources:** Both local and National sources of unit costs were used, including the Alberta Drug Benefit List, as well as published studies.				
Comments				
Source of funding: None. **Limitations:** Uncertainty regarding the applicability of unit costs from Canada, in 2007 to current NHS context. The discount used is 5% for both costs and outcomes; however, this was tested in a sensitivity analysis with a range of 0-6%. It is not clear which utility measure was used to derive the utility values used in the model. The health states included in the long term of the model does not seem to include CTEPH as a complication of PE. Baseline risks as well as relative effectiveness are based on the results of an observational cohort and single RCT so by definition, not reflective of all the evidence in this area. Both local and national unit costs were used in the analysis, so may not be generalisable. Utility values were not tested in sensitivity analysis.				
Overall applicability:[(c)] Partially applicable **Overall quality**[(d)] Potentially serious limitations				

Abbreviations: 95% CI: 95% confidence interval; CTEPH: chronic thromboembolic pulmonary hypertension; CUA: cost-utility analysis; EQ-5D: Euroqol 5 dimensions (scale: 0.0 [death] to 1.0 [full health], negative values mean worse than death); ICER: incremental cost-effectiveness ratio; N/a: not applicable; NR: not reported; PCD: pneumatic compression device; QALYs: quality-adjusted life years, RCT: Randomised controlled trial; SAs: sensitivity analyses; SDU: serial Doppler Ultrasound; VCF: vena-cava filter.

(d) For studies where the time horizon is longer than the treatment duration, an assumption needs to be made about the continuation of the study effect. For example, does a difference in utility between groups during treatment continue beyond the end of treatment and if so for how long.

(e) Converted using 2007 purchasing power parities[715]

(f) Directly applicable / Partially applicable / Not applicable

(g) Minor limitations / Potentially serious limitations / Very serious limitations

Study	**[Lynd 2007[590]]**			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**

Economic analysis: CCA (health outcomes: life-years gained (LYG), DVT averted, PE averted, MB, mortality) **Study design:** Decision analytic model **Approach to analysis:** Decision tree model run probabilistically. **Perspective:** Canadian Heath care payer **Time horizon:** lifetime **Treatment effect duration:**[(a)] NR **Discounting:** Costs: 0% ; Outcomes: 5%	**Population:** Patients with major trauma (trauma score of =>9) **Cohort settings:** Start age: 39 years Male: 72% **Intervention 1:** UFH 5000 units once daily. **Intervention 2:** LMWH (enoxaparin 30 mg once daily).	**Total costs (mean per patient):** Intervention 1: £6,572 Intervention 2: £6,619 Incremental (2−1): £47 (95% CI: NR; p=NR) **Currency & cost year:** 2003 Canadian dollars (presented here as 2003 UK pounds(b)) **Cost components incorporated:** Direct costs incurred during the hospital stay including: a) Mean total cost of hospital stay for treated patients b) Mean cost of diagnosis and treatment of DVT and PE c) Additional cost of prophylaxis due to major bleeds	**LYG (mean per patient):** Intervention 1: 17.05 Intervention 2: 16.92 Incremental (2−1): - 0.13 (95% CI: NR; p=NR) **DVT (mean per patient):** Intervention 1: 0.147 Intervention 2: 0.061 Incremental (2−1): - 0.086 (95% CI: NR; p=NR) **PE (mean per patient):** Intervention 1: 0.003 Intervention 2: 0.0012 Incremental (2−1): -0.0018 (95% CI: NR; p=NR) **MB (mean per patient):** Intervention 1: 0.0084 Intervention 2: 0.0388 Incremental (2−1): 0.0018 (95% CI: NR; p=NR) **Mortality (mean per patient):** Intervention 1:0.01 Intervention 2: 0.003 Incremental (2−1): - 0.007 (95% CI: NR; p=NR)	**ICER (Intervention 2 versus Intervention 1)-DVT primary outcome:** £553 per DVT averted (pa) 95% CI: NR Probability Intervention 2 cost-effective (£20K/30K threshold): NR Probability Intervention 2 cost-effective (£10,435 ($20,000 Canadian dollars (2003) threshold): 93% **ICER (Intervention 2 versus Intervention 1)-LYG primary outcome:** Intervention 2 dominated (less effective and more costly) (pa) 95% CI: NR Probability Intervention 2 cost-effective (£20K/30K threshold): NR Probability Intervention 2 cost-effective (£10,435 ($20,000 Canadian dollars (2003) threshold): 9% **Analysis of uncertainty:** PSA as well as 1-way, 2-way DSA. All analyses had minor effects on the ICERs with UFH remaining dominant when LYG was used as the primary outcome.
Data sources				

Health outcomes: A systematic review of the literature was undertaken but only a single RCT (Geerts 1996[340]) was retrieved and used as the source of data on baseline risk and relative efficacy. **Quality-of-life weight:** N/A. **Cost sources:** local unit costs were used for pharmacological prophylaxis. Ontario Nurses Union collective bargaining agreement and London Health Sciences Centre, London, Ontario were the reported unit cost sources.
Comments
Source of funding: Canadian Institutes for Health Research post-doctoral fellowship; Michael Smith Foundation for Health Research; Heart and Stroke Foundation of Ontario. **Limitations:** Uncertainty regarding the applicability of unit costs from Canada, in 2003 to current NHS context. The discount used is 5% for outcomes; however, this was tested in a sensitivity analysis with a range of 3-7%. QALYs were not used as outcome. The health states included in the long term of the model do not include distal DVT, CTEPH and PTS. Baseline risks as well as relative effectiveness are based on the results of a single RCT (Geerts 1996[340]) so by definition, not reflective of all the evidence in this area. Both local and national unit costs were used in the analysis, so may not be generalisable.
Overall applicability:(c) partially applicable **Overall quality**(d) potentially serious limitations

Abbreviations: CCA: cost-consequences analysis; 95% CI: 95% confidence interval; CTEPH: Chronic thromboembolic hypertension; da: deterministic analysis; DSA: deterministic sensitivity analysis; DVT: deep vein thrombosis; LYG: life-years gained; ICER: incremental cost-effectiveness ratio; NR: not reported; pa: probabilistic analysis; PE: pulmonary embolism; PSA: probabilistic sensitivity analysis; QALYs: quality-adjusted life year; PTS: post-thrombotic syndrome; RCT: randomised controlled trial.

(a) For studies where the time horizon is longer than the treatment duration, an assumption needs to be made about the continuation of the study effect. For example, does a difference in utility between groups during treatment continue beyond the end of treatment and if so for how long.

(b) Converted using 2003 purchasing power parities[715]

(c) Directly applicable / Partially applicable / Not applicable

(d) Minor limitations / Potentially serious limitations / Very serious limitations