



## EDITORIALS

# Preventing hospital associated venous thromboembolism

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An NHS success story that should be exported globally

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Venous thromboembolism is a serious healthcare problem affecting over 1 in 1000 adults worldwide annually.<sup>1</sup> Epidemiological studies have shown that before the use of thromboprophylaxis in hospital, 55-60% of all venous thromboembolisms were related to hospital admission, occurring either in hospital or within 90 days after discharge.<sup>1</sup>

Over 10% of deaths in hospital are related to pulmonary emboli, and autopsy studies show that many (two thirds in one study) are missed.<sup>2</sup> Thus the latest figures on prevention of venous thromboembolism from NHS England are to be celebrated. They show that since a systematic approach to preventing hospital associated venous thromboembolism was introduced in 2010, there has been a 15.4% reduction in deaths within 90 days after discharge.<sup>3</sup>

## Mandatory reporting

In 2010, NHS England mandated reporting of risk of venous thromboembolism with a target of 90% of adult admissions (increased later to 95%).<sup>3</sup> This systematic approach to risk assessment resulted from concerted lobbying by health professions, patient groups, and politicians about the poor uptake of thromboprophylaxis. An emergency government health select committee in 2004-05<sup>4</sup> demanded that each hospital had a thrombosis committee to oversee prevention, requested that the National Institute for Health and Care Excellence (NICE) produce comprehensive guidelines on preventing venous thromboembolism, and asked NHS England to develop a risk assessment tool.

The spectre of financial sanctions when risk assessment targets were set in 2010 meant that hospitals developed infrastructure to deliver prevention. By 2019, risk assessment, adherence to the NICE thromboprophylaxis guidance, and root cause analysis of cases of hospital associated venous thromboembolism had been embedded in hospital contracts.

Where do we go from here? NICE updated its thromboprophylaxis guidance (NG89) in 2018 and indicated that prevention of venous thromboembolism was cost effective.<sup>5</sup>

The update has proved controversial, with perhaps the biggest rebellion over the request for preventive treatment to be given for a week rather than for "length of stay," as recommended in the 2012 guidelines. All clinical trials evaluating thromboprophylaxis for hospital patients used a minimum treatment period of one week. However, the average length of stay of both medical and surgical patients in 2019 is much shorter than this. To comply with the new guidance hospitals must ask patients to inject themselves with low molecular weight heparin at home after discharge or incur the costs associated with visits from a district nurse.

Although NICE judges that one week's treatment is cost effective, most English trusts have pragmatically elected not to apply these changes to avoid higher costs for cash strapped trusts and extra work for district nurses. A trial comparing treatment for a week with treatment during hospital stay only is urgently required to provide better evidence for policy and practice.

Rates of venous thromboembolism after surgery have fallen over the past 50 years in high income countries, partly because of thromboprophylaxis but largely because of improved surgery and anaesthesia, earlier mobilisation, and shorter hospital stays.<sup>6</sup>

One unanswered question is the effectiveness of mechanical methods of thromboprophylaxis. Despite NHS England spending tens of millions of pounds each year on antiembolic stockings, evidence to support their use is limited. No trial of antiembolic stockings has reported a reduction in rates of pulmonary embolism. We wait with interest for the results of the GAPS study, which randomised around 2000 moderate risk surgical patients receiving pharmacological thromboprophylaxis to antiembolic stockings or no stockings.<sup>7</sup> Evidence for intermittent pneumatic compression is more solid, but more research is required to evaluate the variable short term use that often occurs in real world perioperative settings.<sup>8</sup>

## Global problem

Hospital acquired venous thromboembolism is a global problem. In a major study sponsored by the World Health Organization, it accounted for more deaths and disability than nosocomial pneumonia, catheter related bloodstream infections, or adverse drug events in low and middle income countries.<sup>9</sup>

Widespread adoption of NHS England's systematic approach to thromboprophylaxis would be of huge benefit to WHO's poorly progressing plan of reducing premature mortality from non-communicable disease by 25% by 2025.<sup>10</sup> WHO currently has no programme or data to help reduce hospital associated venous thromboembolism globally, but the International Society for Thrombosis and Haemostasis is working with WHO's patient safety group to meet this challenge.

Patients have a right to expect that their hospital stay is safe and that the risk of adverse events such as venous thromboembolism is minimised. It is time to roll out risk assessment for all hospital patients globally, to guide the use of appropriate thromboprophylaxis. Such an approach will save lives, reduce morbidity, and reduce the incremental costs of venous thromboembolism to healthcare systems.<sup>11</sup>

Competing interests: *The BMJ* has judged that there are no disqualifying financial ties to commercial companies. BJH also declares that she is medical director of Thrombosis UK and chairs the steering group of World Thrombosis Day. Further details of *The BMJ's* policy on financial interests is here: <https://www.bmj.com/sites/default/files/attachments/resources/2016/03/16-current-bmj-education-coi-form.pdf>.

Provenance and peer review: Commissioned; not externally peer reviewed.

- 1 Heit JA. The epidemiology of venous thromboembolism in the community. *Arterioscler Thromb Vasc Biol* 2008;28:370-2. 10.1161/ATVBAHA.108.162545 18296591
- 2 Sweet PH3rd, Armstrong T, Chen J, Masliah E, Witucki P. Fatal pulmonary embolism update: 10 years of autopsy experience at an academic medical center. *JRSM Short Rep* 2013;4:2042533313489824. 10.1177/2042533313489824 24040503
- 3 NHS England. VTE risk assessment 2016/17. <https://www.england.nhs.uk/statistics/statistical-work-areas/vte/vte-risk-assessment-201617/>
- 4 House of Commons Health Committee. The prevention of venous thromboembolism in hospitalised patients. Second report of session 2004-05. 2005. <https://publications.parliament.uk/pa/cm200405/cmselect/cmhealth/99/99.pdf>
- 5 Stansby G, Donald I, Barry P, Dawoud D, Sharpin C. NICE NG89 recommendations for extended pharmacological thromboprophylaxis—is it justified and is it cost effective: a rebuttal from the British Society for Haematology—response to Lester et al. *Br J Haematol* 2019. [Epub ahead of print.] 10.1111/bjh.16004 31148151
- 6 Xu K, Chan NC, Ibrahim Q, et al. Reduction in mortality following elective major hip and knee surgery: a systematic review and meta-analysis. *Thromb Haemost* 2019;119:668-74. 10.1055/s-0039-1677732 30699447
- 7 Centre for Healthcare Randomised Trials. Graduated compression as an adjunct to pharmacoprophylaxis in surgery (GAPS). <https://w3.abdn.ac.uk/hsru/gaps/>
- 8 Kakkos SK, Caprini JA, Geroulakos G, et al. Combined intermittent pneumatic leg compression and medication for the prevention of venous thromboembolism. *Cochrane Database Syst Rev* 2016;9:CD005258.27600864
- 9 Jha AK, Larizgoitia I, Audera-Lopez C, Prasopa-Plaizier N, Waters H, Bates DW. The global burden of unsafe medical care: analytic modelling of observational studies. *BMJ Qual Saf* 2013;22:809-15. 10.1136/bmjqs-2012-001748 24048616
- 10 WHO. Time to deliver: report of the WHO independent high-level commission on noncommunicable diseases. 2018. <https://www.who.int/ncds/management/time-to-deliver/en/>
- 11 NICE. Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism. NICE guidance 89. 2018. <https://www.nice.org.uk/guidance/ng89>

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