New risk prediction tool for venous thromboembolism

**Overview:** Venous thromboembolism (VTE) is a condition in which a blood clot (a thrombus) forms in a vein. Embolism occurs when the thrombus dislodges from its site of origin and travels in the blood.

VTE is an important and preventable cause of morbidity and mortality, with almost a third of survivors experiencing long term effects. To improve survival and prevent complications, the occurrence of VTE needs to be reduced.

**Current advice:** [NICE guidance](https://www.nice.org.uk/guidance) on reducing the risk of VTE in patients admitted to hospital, highlights the need for new research to develop and validate risk prediction models for use by primary care research databases.

Although there are currently no validated algorithms to predict risk for VTE designed for use in primary care, computerised clinical decision support could improve appropriate use of thromboprophylaxis in a hospital setting.

Extended VTE prophylaxis is a research recommendation in the current NICE guidance and features in the [VTE NICE Quality Standard](https://www.nice.org.uk/qualitystandards/qualitystandard/venous-thromboembolic-episodes-vte).

NICE has guidance in development on the [management of venous thromboembolic diseases and the role of thrombophilia testing](https://www.nice.org.uk/guidance).

**New evidence:** A prospective cohort study used data routinely collected from 564 general practices in England and Wales to develop a [new clinical risk prediction algorithm](https://www.rcgp.org.uk/clinical-guidance/guidance/nice-guidance-on-reducing-risk-of-venous-thromboembolism-3297) to estimate individual patients' risk of VTE ([Hippisley-Cox and Coupland 2011](https://www.ncbi.nlm.nih.gov/pubmed/21680815)).

The study included information from more than 3.5 million patients aged 25 to 84 years with no previous history of blood clots. First cases of VTE (either deep vein thrombosis or pulmonary embolism) were identified from a patient's medical record or death certificate at 1 and 5 years. The rate of venous thromboembolism was around 15 cases per 10,000 person years of observations.

Results show that the risk of VTE in both men and women increased with age, body mass index and quantity of cigarettes smoked each day. Risks were also elevated among those with varicose veins, congestive heart failure, chronic kidney disease, chronic lung disease, inflammatory bowel disease, and any cancer.

Admission to hospital in the last 6 months also conferred a greater risk, as did taking antipsychotic drugs, oral contraceptives, HRT or tamoxifen.

The researchers conclude that they have developed and validated a new risk prediction algorithm which identifies patients at high risk of VTE with good discrimination and calibration. They suggest that the algorithm, which is based on simple clinical variables that the patient is likely to know or which are routinely recorded in general practice records, could be integrated into general practice clinical computer systems, and used to risk assess patients before hospital admission or starting medication which might increase the risk of VTE. However, they add that further research is needed to assess...
how best to use the algorithm and whether, upon implementation, it has any impact on health outcomes.

**Commentary:** “VTE is the cause of significant mortality and morbidity in the UK. There has been little attention given to the treatment prevention of this despite the evidence for cost effective treatment.

“This study provides the evidence for a tool to assess the risk of VTE in the general population. It is not equivalent to the Wells Clinical Prediction Rule, which is used in people who clinically have a DVT.

“At present there is no consistent approach to risk prediction VTE unlike cardiovascular disease (CVD) risk. Although many of the factors associated with increased risk such as age, smoking and obesity, would seem common sense, this validated tool brings assessment in line with formal CVD risk assessment.

“The tool can be downloaded and used to predict an individual's absolute risk of a VTE in the next 1-5 years and this can be used during a consultation to improve patient management.

“The paper suggests situations where the tool can be helpful. They include assessment of risk prior to surgical treatment or a long haul flight, and when prescribing treatment known to increase risk, for example the combined contraceptive pill or tamoxifen.

“The paper does not provide evidence for the benefits of the tool in routine practice but suggests that it can be used in high risk individuals and to improve the evidence base for VTE. There are no suggestions as to the management of high risk individuals: however some of the factors such as smoking and obesity are modifiable, and a choice can be made not to prescribe medications which increase risk.

“In summary VTE has been a long neglected area and this tool should improve the prevention of mortality and morbidity in high risk individuals.” - Dr Kathryn E Griffith, General Practitioner and GP with a special interest (GPSI) in Cardiology, York

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**About this article:** This article appeared in the March 2012 issue of the [Eyes on Evidence newsletter](mailto:info@evidence.nice.org.uk). This free monthly newsletter from NICE Evidence outlines interesting new evidence and what it means for current practice. They do not constitute formal NICE guidance. The opinions of contributors do not necessarily reflect the views of NICE.

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