All-Party Parliamentary Thrombosis Group

DH Department of Health

Venous Thromboembolism Prevention

A Patient Safety Priority

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Published by:

King's Thrombosis Centre

In conjunction with:

VTE Exemplar Centres
Providing leadership in thrombosis care

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Foreword

Professor Sir Liam Donaldson and John Smith MP

In 2005 the House of Commons Health Select Committee published their *Report on the Prevention of Venous Thromboembolism in Hospitalised Patients*, which highlighted that venous thromboembolism (VTE) accounted for up to 25,000 preventable deaths each year.

Progress over the last four years has been possible due to the emergence of a partnership approach between Parliamentarians, Government, the NHS and patients in addressing this important issue. The Government agreed with the recommendations of the Health Select Committee that "more need[ed] to be done", especially with regard to routinely risk assessing patients for VTE on admission to hospital: this partnership approach has been a major force in shaping the National VTE Prevention Programme.

In April 2007 the Department of Health published the report of an independent expert working group that provided a blueprint for this strategy. That same year the National Institute for Health and Clinical Excellence (NICE) published VTE clinical guidelines for surgical patients; 2007 was an important year for VTE prevention in England, with several documents published that backed the consensus that risk assessment for VTE was a major patient safety intervention that must be made.

The All-Party Parliamentary Thrombosis Group has been a critical friend and played an important role in ensuring that both the focus and implementation of the National VTE Prevention Programme has remained on reducing avoidable death from VTE. Until now work has largely concerned prevention of VTE in hospital patients, though it has always been recognised in today's NHS that the continuum of patient care spans primary and secondary care and the diverse wider healthcare setting.

Dr Anita Thomas OBE has been leading the work on VTE prevention for the Government since Ministers established an expert group in 2005. In 2008, collaboration between Dr Thomas, her team and NICE resulted in the publication of a national risk assessment template by the Department of Health. We welcome the Department of Health policy that all adult patients receive a risk assessment for VTE on admission to hospital as it builds on growing international consensus that this is the most important safety practice available.

NICE are due to publish VTE clinical guidelines for all hospitalised patients in November this year. At this point we in England will be in the unique position of having a national risk assessment policy backed up by comprehensive national clinical guidelines – for surgical and, importantly, for medical patients. Much progress has been made since 2005 when the Government agreed with the Health Select Committee that "there is no systematic approach to identifying and treating those patients at risk from VTE in hospitals and … there is significant room for improvement".

VTE prevention has too long been overlooked as a priority and only now are we beginning to

> There are about 25,000 deaths a year from thromboembolism. It is a serious issue that requires comprehensive action.
>
> **Former Prime Minister, Rt Hon Tony Blair MP, 10 May 2006**

understand the challenge around better VTE metrics and related health economics issues. In 2005 the Health Select Committee estimated that there were around 25,000 deaths each year from VTE in hospitals in England and that the cost of treating the long-term disability caused by VTE was around £640 million a year. In 2007 there were 16,670 recorded deaths in England and Wales where pulmonary embolism and deep vein thrombosis (VTE) were mentioned on the death certificate (Office of National Statistics). However, the overall death rate from VTE in hospital and the community is likely to be significantly higher since the condition is often clinically silent and deaths are not being identified due to a reduction in post-mortem examinations. Indeed, it has been estimated that fewer than 1 in 10 fatal pulmonary emboli are diagnosed before death. The emerging picture of death and acute and chronic disability (such as chronic venous insufficiency, venous leg ulcers and pulmonary hypertension) leaves no room for complacency when low-cost effective preventative treatments are available.

VTE prevention is, above all, about saving lives and reducing long-term ill-health. This is a common and often avoidable circumstance – many of us committed to VTE prevention know of friends, relatives, colleagues and patients who have suffered a deep vein thrombosis or a pulmonary embolism. We have long known of safe, effective and straightforward methods of prevention and will continue to work towards widespread recognition that VTE prevention is one of the most important new patient safety issues and ensuring that the major opportunities offered by the new NHS arrangements outlined by Lord Darzi are fully exploited to improve the quality of patient care in England in this regard.

Chief Medical Officer

Chair of All-Party Parliamentary Thrombosis Group

The National Venous Thromboembolism Prevention Programme in England

Dr Anita Thomas OBE, Consultant Physician, Plymouth Hospitals NHS Trust
and Mr Tim Brown, Policy Advisor for the National VTE Prevention Strategy in England, Plymouth Hospitals NHS Trust

Venous thromboembolism (VTE) is one of the commonest causes of avoidable death in our hospitals. In 2005 the Government was forthright in its observation that "there is no systematic approach to identifying and treating those patients at risk from VTE in hospitals and that there is significant room for improvement". Sir Liam Donaldson, the Chief Medical Officer (CMO), has described VTE as "a significant international patient safety issue".

Under Sir Liam's leadership over the last four years good progress has been made throughout the NHS and across the wider healthcare sector to reduce avoidable death and long-term illness and disability from VTE. We now have in place the key elements of a comprehensive National VTE Prevention Programme needed to support the implementation of Government policy that every adult patient undergoes an assessment of their individual risk for VTE on admission to hospital with appropriate prophylaxis based on national guidance as part of a systematic and auditable process.

During this period the NHS has been undergoing significant change as Lord Darzi's "Next Steps" reforms are implemented across the NHS. As a result the VTE implementation strategy is under constant review in order to ensure that it is consistent with these important reforms in healthcare delivery and able to maximise the opportunity to effect significant change – for example, through the new approach to quality indicators.

The publication of a national VTE risk assessment template by the Department of Health has been described as a "world first". A VTE prevention pathway has been published by Map of Medicine (see page 8), e-VTE learning modules have been developed by the Department's e-Learning for Healthcare team (see page 16) and Connecting for Health are developing an electronic VTE risk assessment tool (see page 10). Later this year the National Institute for Health and Clinical Excellence will publish comprehensive clinical guidelines for all hospitalised patients.

Safe and effective methods of prevention of VTE have been known for many years but the importance and scale of VTE as a public health and patient safety issue has remained largely unrecognised. A cornerstone of the National VTE Prevention Strategy is to raise awareness in both healthcare professionals and the public of the risk of the serious short- and long-term consequences of VTE and of the existence of effective and safe prevention. When we meet clinicians and managers across the NHS we find near universal support for the work and an appreciation that the issue of VTE prevention is now seen as a priority for the NHS. Contributions in this document about initiatives in the United States and Australia speak to a wider international context of the work currently underway in England to reduce avoidable death from VTE.

Developing a systematic approach to VTE prevention has been less about making additional resources available and more about a commitment to a shared aim of reducing avoidable death, freely given by partners from the diverse healthcare sector. VTE prevention in England owes a debt of gratitude to those Parliamentarians who highlighted the issue in 2005 and who have been consistently supportive of the work that Sir Liam Donaldson is leading.

Particular thanks must go to the Hon John Smith MP and Dr Richard Taylor MP, respective Chair and Vice-Chair of the All-Party Parliamentary Thrombosis Group, for their personal commitment to this important issue.

This VTE prevention document is itself an example of the multidisciplinary nature of effective VTE prevention, including contributions from nurses, pharmacists, managers, doctors, commissioners, academics, directors and boards. It provides a useful snapshot of the progress being made to engage the NHS and others in VTE prevention. There is much more to do and work led by the CMO will continue to:

- Raise awareness among professionals and the public of VTE prevention and the Department of Health risk assessment policy
- Engage with senior managers and doctors in implementing VTE risk assessment in local hospitals and in assessing compliance across the NHS with the Department of Health risk assessment policy
- Develop regional VTE prevention
- Develop better metrics on VTE in hospitals across England
- Ensure VTE prevention is understood by service commissioners and becomes part of the commissioning framework
- Raise awareness of VTE prevention in primary care and the community in general.

> Each year over 25,000 people in England die from venous thromboembolism (VTE) contracted in hospital. This is more than the combined total of deaths from breast cancer, AIDS and traffic accidents, and more than twenty-five times the number who die from MRSA. The figures are alarmingly high. Even more alarming is the fact that many of these deaths are preventable. There is a safe, efficacious and cost effective method of preventing venous thrombosis which is not being as widely administered as it should be.
>
> **Health Select Committee Report, 2005**

Ultimately VTE prevention is about people, saving lives and avoiding long-term ill health. The enthusiastic and active involvement of the third sector remains crucial and we look forward to continuing our work with charities, such as Lifeblood, Anticoagulation Europe and the Thrombosis Research Insitute, who have spoken so consistently for people and patients on this issue.

We have been asked by Ministers and the CMO to visit throughout the NHS to discuss with senior managers and clinicians local strategies for implementing VTE risk assessment for all adult hospital patients. In monitoring compliance with the Department of Health's VTE risk assessment policy the Government will take into account the findings from this programme of visits as well as any information available from other sources, such as the All-Party Parliamentary Thrombosis Group.

We can be contacted at vteimplementation@btinternet.com for further information about the National VTE Prevention Programme and to arrange a visit.

Fig 1
National VTE prevention guidelines and the national risk assessment template are key components of the VTE Prevention Programme.

BIOGRAPHY

Dr Anita Thomas OBE is a consultant physician in acute medicine at Plymouth Hospitals NHS Trust.

Anita chaired the Chief Medical Officer's (CMO) independent expert working group on the prevention of venous thromboembolism (VTE) in hospitalised patients, and now leads for the CMO on this work.

Anita is a Board member of the Postgraduate Medical Education and Training Board (PMETB) and chaired the Training Committee for five years, she is a member of the UK Panel for Research Integrity in Health and Biomedical Sciences, the Scientific Advisory Committee on Nutrition and is the CMO's representative on the Human Genetics Commission.

Tim Brown has over 20 years experience as a civil servant in various Government Departments. In 1998, Tim moved to the Department of Health where he worked on a number of policy areas including older people with health problems, NHS Dentistry and VTE. In 2005, Tim coordinated the Government response to the Health Select Committee Report on the Prevention of Venous Thromboembolism in Hospitalised Patients and took on the role of Secretary to the CMO's VTE Independent Expert Working Group. In December 2006, Tim left the Department of Health to support the National VTE Prevention Programme being led by Dr Anita Thomas OBE on behalf of the CMO and is currently based at Plymouth Hospitals NHS Trust.

Risk assessment for venous thromboembolism

Dr Trevor Baglin, Consultant Haematologist, Cambridge University Hospitals NHS Foundation Trust

The risk of venous thromboembolism (VTE) in a hospitalised patient depends not only on the reason for admission (procedural risk) but also on co-existent patient-related factors (patient-related risk). The decision as to whether a patient requires thromboprophylaxis depends on the absolute thrombosis rate and the choice of prophylaxis depends on the balance between absolute thrombosis and bleeding risks.

For each patient an assessment of risk should be undertaken on admission and ideally reviewed periodically during hospitalisation, particularly in medical patients whose risk may escalate. Depending on the degree of risk, patients should receive advice and treatment to reduce risk. Patients should be mobilised early and prophylaxis should be given to patients at moderate to high risk.

Risk assessment in surgical patients has, to date, been driven primarily by the procedural risk. Risk assessment for medical patients is not as well established and there is a need for education and training so that the risk of VTE in medical patients is as well recognised as it is in surgical patients.

A single risk assessment format or model at the point of entry to hospital for all patients is feasible and may be advantageous. The link between the output of the risk assessment and the intervention must be clear.

Using a risk assessment model

It is Department of Health policy that all adult patients receive a risk assessment on admission to hospital. It is recommended that all patients be periodically reassessed during inpatient stay as risk may change. Reassessment after at least 48 to 72 hours is recommended.

A national VTE risk assessment template has been published by the Department of Health (http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_088215). The use of this specific format is not mandated but it is made available for local implementation or as a template or checklist for hospitals that have developed, or wish to develop, their own risk assessment process.

Implementation

The Second Report of the All-Party Parliamentary Thrombosis Committee was published in November 2008 and indicated that while 85% of NHS Trusts have a written thromboprophylaxis protocol, only 60% performed a documented risk assessment for surgical patients and less than 25% for medical patients. Considerable efforts are currently underway across the NHS to achieve the goal of assessment of all patients for their VTE risk, as advised by the Chief Medical Officer. At a meeting of the UK Thromboprophylaxis Forum held at the Royal College of Physicians in London on 10th December 2008, ten 'hurdles' to implementation were identified:

- Perception of problem by clinicians
- Agreement on the Risk Assessment Model
- Agreement on the intervention
- Implementation of extended prophylaxis
- Who assesses and prescribes
- Training and competency
- Implementation
- Funding
- Change management
- Lack of patient empowerment and engagement.

Conclusion

There is now widespread recognition of the need to reduce the incidence of venous thrombosis in hospitalised patients. This will be achieved by individual patient risk assessment on admission and targeting of prophylaxis at moderate- and high-risk patients. While this may appear to be a simple process, a reduction in the burden of disease requires a concerted effort across the healthcare sector. How risk assessment will be performed, by whom and at what point during hospitalisation requires consideration.

> "There has been more emphasis on the occurrence and prevention of VTE in surgical, especially orthopaedic, patients, but the majority of hospitalised patients who experience VTE are medical patients."
>
> **Health Select Committee Report, 2005**

> Estimates of the number of deaths in the UK due to VTE vary. The evidence we received put the figures at between 24,000 and 32,000 per year. Precise numbers are difficult to gauge because many deaths are not followed up by a post-mortem. As a result the number of deaths resulting from VTE is probably underestimated.
>
> **Health Select Committee Report, 2005**

Fig 1
A patient awaiting an elective surgical procedure is assessed for her risk of VTE.

Fig 2
VTE risk assessment of hospitalised medical patients is not as well established as for surgical patients and there is a need for education and training.

BIOGRAPHY

Dr Trevor Baglin is Consultant Haematologist at Addenbrooke's Hospital Cambridge. His main clinical and research interests are in haemostasis and thrombosis. For the past six years he has been Chairman of the Haemostasis and Thrombosis Task Force for the British Committee for Standards in Haematology (BCSH) and is now Chairman of the BCSH. He is the Chairman of the Subcommittee for Control of Anticoagulation for the International Society for Thrombosis and Haemostasis.

Map of Medicine and venous thromboembolism pathways

Dr Mike Stein, Medical Director, Map of Medicine

Why a Map of Medicine?

Healthcare is a risky business where even minor procedures or treatments can cause the death of a patient. Yet GPs, hospital-based consultants on post-intake ward rounds and locums are expected to help patients to make informed decisions across a wide range of conditions. In addition, reduced doctors' hours of work and shift working have created many more handover points. Few would argue with the need for a professional map of care processes, one that describes the idealised patient journey across the range of care and which makes specialist evidence-based healthcare information more accessible to generalists and to the entire multidisciplinary team.

However, there are often conflicts of professional opinion both within and across specialties and any map must be able to accommodate such conflicts in a transparent manner so as not to stifle innovation or promote 'cook-book' medicine. This demands the creation of a tool that is clinically intuitive and can mediate a meaningful dialogue between healthcare professionals about what are (and what are not) acceptable standards of care: a dynamic or 'living' map that can change and evolve.

The Map of Medicine (the Map) assists organisations and individuals to ensure that they remain abreast of the ever-increasing array of healthcare technologies and innovations across areas of healthcare outside their specialty domain yet pertinent to holistic patient care.

Why embed the VTE prevention pathway within the Map?

Venous thromboembolism (VTE) prevention is relevant to everyone within the hospital and primary care multidisciplinary team – however, this is just one topic that is important to the generalist, so embedding the VTE risk assessment and prevention pathway within the Map ensures that the generalist (for example, a consultant on a post-intake ward round, a GP or new locum doctor) can typically find the information they require, hence disseminating information consistently. The Map covers over 350 topics with more added every quarter.

In addition, locally specific information allows merging local policies and protocols with the power of the international evidence base within the Map to create a flexible national, but locally controlled, clinical knowledge framework for the healthcare system. For example, the VTE Map can be adapted to suit local choices of drugs (such as NICE-approved anticoagulants), providing local ownership.

The Map of Medicine is available license-free to individuals across the NHS England and Wales[1] and is named as one of the genuine success stories within the National Programme for IT.[2]

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> "The Government agrees with the Committee's statement that much more needs to be done and that there are currently far too many preventable deaths from venous thromboembolism in hospitalised patients. The Committee's estimation of 25,000 deaths a year due to VTE is a serious issue which requires rapid and comprehensive action."
>
> **Government response to Health Select Committee Report, 2005**

"The dangers of venous thromboembolism in hospitalised patients have long been recognised, but our challenge was to find a systematic approach to identify patients most at risk.

Creating a standardised national preventive strategy on this scale is a world first. We anticipate that, by hospitals implementing risk assessment for all patients admitted to hospital, we can make the goal of reducing death from venous thromboembolism more attainable. This simple step has the potential to save thousands of lives each year."

Sir Liam Donaldson, Chief Medical Officer

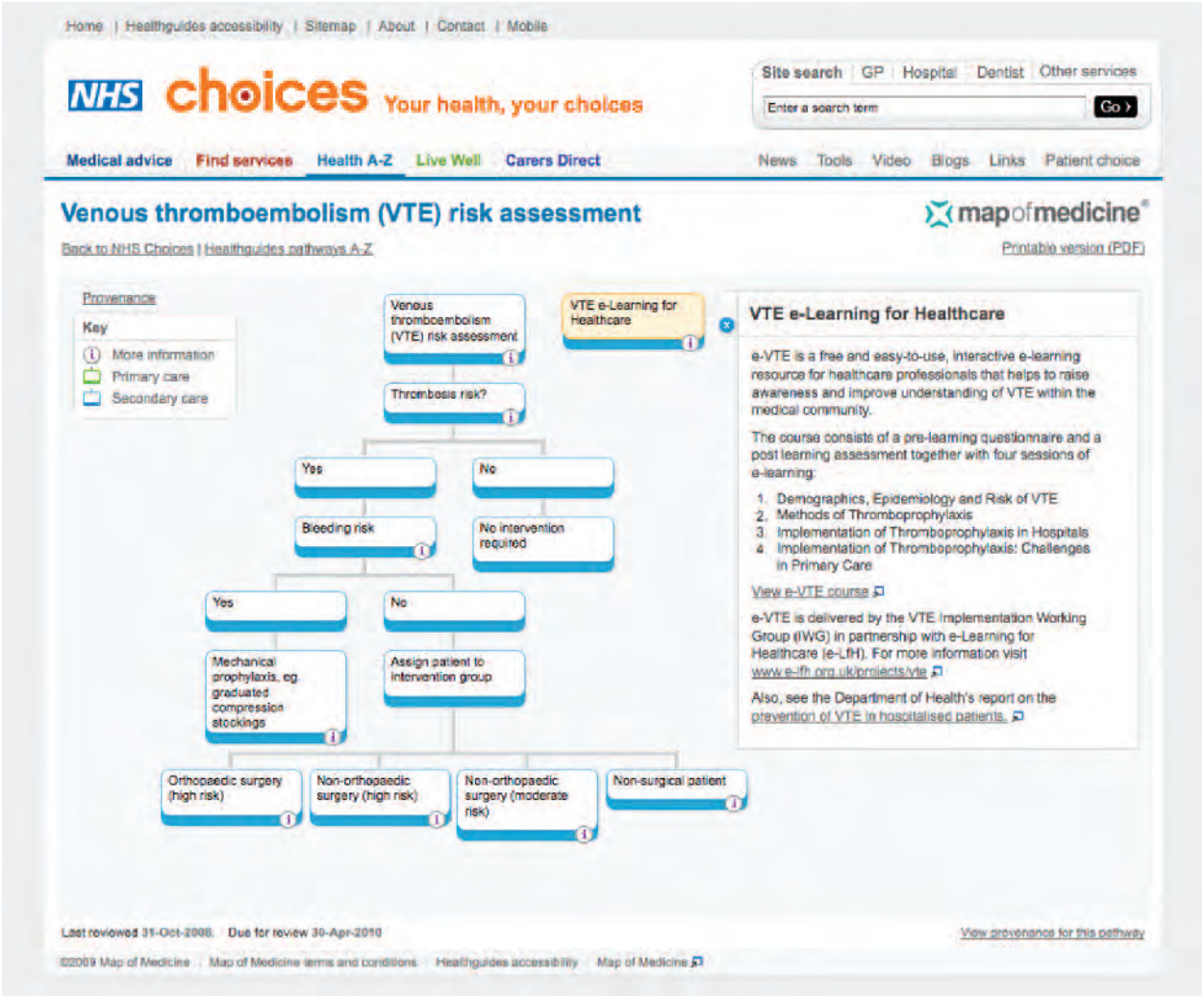

Fig 1
Image of VTE Map of Medicine Pathway showing the ability to link from a node in the Map to the e-LfH e-learning module.

A read-only version of the Map is available on NHS Choices at http://healthguides.mapofmedicine.com. The professional version (which allows localisation of the content) is licensed for use by all NHS staff and GPs. To find out how to access the Map visit www.mapofmedicine.com.

BIOGRAPHY

Dr Mike Stein qualified as a medical doctor and completed a doctorate in Immunology at the University of Oxford as a Rhodes Scholar.

As Junior Research Fellow in Medicine at Trinity College, Oxford (1991-95), he taught medical students, conducted research and co-authored The Hands on Guide for House Officers (Donald and Stein; Third Edition, Blackwell Publishers).

Mike became Medical Publisher for Blackwell Publishers in 1996 and co-founded Medschool.com (www.medsn.com), a California-based online medical education and informatics company in 1999. In 2001 he established Map of Medicine® with University College London and directed it's development. Mike became Medical Director at Map of Medicine Ltd following acquisition of the Map of Medicine by the Hearst Corporation in 2008.

Developing electronic approaches to risk assessment

Dr Maureen Baker CBE, Clinical Director for Patient Safety, NHS Connecting for Health

Information technologies (IT) have huge potential in supporting clinicians to practise more safely. There is currently no technological reason why hospital clinical staff should not conduct structured risk assessments when patients are admitted to hospital using either paper tools or an assessment tool presented on an electronic platform. It is a range of human factors that prevent an assessment from being completed, such as lapses due to time pressures, forgetfulness or the materials for the assessment not being easily accessed from the bedside.

Within the hospital setting, IT can be used for the structured organisation and easy availability of information. Bates and Gawande identified a number of ways in which IT can reduce error: improving communication, making knowledge more readily accessible, prompting for key pieces of information (such as the dose of a drug), assisting with calculations, monitoring and checking in real time and providing decision support.[1] A report on the potential to develop an electronic tool[2], commissioned for NHS Connecting for Health, suggested that the assessment of the risk of venous thromboembolism (VTE) is exactly the kind of task that tends to be poorly done by busy people working in complex systems. Many studies in different areas of healthcare, such as medication administration and blood transfusion, have shown that routine processes are not carried out reliably. If all hospital inpatients are to be assessed, and if prescribing is to be carried out properly and reliably, we have to employ IT.

Additionally, there is little point in having a tool that can only be accessed centrally, at a workstation remote from the patient's bedside. If the use of the technology does not fit in with the clinical workflow then busy clinicians will either forget to use the tool or just not get round to doing it. Ideally then, the tool should be available in a mobile format: it should be small, light and very easy to use. It may be some time before an electronic tool for risk assessment of VTE can be available within a format that meets these criteria, but that should be the ultimate aim.

The reliable transmission of key pieces of information is also an area in which IT should be supporting the busy clinician. In the case of VTE risk assessment much of the information needed to populate the criteria (e.g., past medical history, use of the oral contraceptive pill) is currently available within the IT systems used by all GPs in the UK. If this information were to be collated in real time then if a patient is admitted to hospital – either for an elective procedure or in an emergency – it would be much easier and quicker to conduct the risk assessment. This could be done by having a 'dynamic' risk assessment area within the patient's Summary Care Record (SCR; a collection of essential patient information from the GP record that can be viewed by NHS clinicians wherever the patient presents for care). This would also have the advantage of being able to be viewed by patients themselves through their Healthspace accounts whereby patients can view the information stored on their SCR. When patients know that this is important information that can be used to protect them from the risks of developing blood clots in hospital, it is likely that they will themselves be asking whether they need preventative measures during a hospital admission.

So IT can potentially be used to provide tools that are accessible, easy to use and effective in presenting clinicians with the information they require – there and then – to determine patients' risks of developing VTE during an admission.

NHS Connecting for Health is working with its partners to develop viable technological solutions to prevent VTE.

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> "VTE has for many years been a Cinderella issue, and it is not by accident that VTE is known internationally as the silent killer."
>
> **Sir Liam Donaldson, Chief Medical Officer**

> As part of the Government's approach to VTE we therefore intend to develop a comprehensive strategy that includes both treatment and prevention.
>
> **Government response to Health Select Committee Report, 2005**

Fig 1
Employing IT is key to improving routine processes in healthcare.

Fig 2
Any electronic VTE risk assessment aide should be available in a mobile format.

BIOGRAPHY

Dr Maureen Baker's role within the clinical safety programme is to promote and help embed safer working practice methods and patient safety solutions, enabled by IT, applied consistently across the NHS and to ensure that systems delivered through the National Programme for IT (NPfIT) are clinically safe.

The vision of the programme is to promote NHS Connecting for Health as a patient safety organisation, and to champion patient safety, through the application of well-designed software and resilient IT systems, and through its support for safe design initiatives.

Maureen has a long established interest in patient safety and was previously Director of Primary Care at the National Patient Safety Agency (NPSA). She is a GP by background and Honorary Secretary at the Royal College of General Practitioners.

Developing NICE guidelines for venous thromboembolism prevention

Professor Tom Treasure, Clinical Operational Research Unit, University College London

I will not use this space to give a potted account of the NICE guidance on prevention of venous thromboembolism (VTE) – that is already available in long and short form – but instead I will set out the reasons why it is sensible at many levels to both know the guidance as it applies to your own area of practice, and to use it.

An early landmark in the movement that came to be known as 'evidence-based medicine' was the publication over 20 years ago of an 'overview' of randomised trials which, taken together, established that the use of subcutaneous heparin in surgical patients reduced fatal pulmonary embolism (PE).[1] Prophylaxis is, by its nature, a decision that has to be made ahead of time and it is not a matter where individual clinical judgements are likely to be helpful. It is a matter of playing the odds: trading the numerically small risk that the individual patient might die of PE against the also numerically small risk of serious bleeding. To achieve that nadir requires analysis of the evidence. On the best analysis that can be achieved from the best available evidence, a policy must be spelt out in black and white in the working practices of a clinical team.[2] Not long after promulgating that philosophy, I was in the operating theatre in the early hours of the morning retrieving a near-perfect cast of the iliofemoral vein from the pulmonary artery, a rare opportunity to retrieve the life of a patient near to death from PE. The orthopaedic houseman (to his credit at 3:00 am) was witness and soon after his chief wrote in the *BMJ* "What is inescapable is the need for prophylaxis."[3]

About 20 years on we are seeking to give more precise guidance. In particular there are groups in which the harms exceed the benefit, or where the benefit is too small to justify the cost. The Appendix to the NICE guidance to be published later this year runs to about 700 pages. It contains 150 pages of dense evidence tables, 250 forest plots and 500 references. This accumulation of evidence has been achieved by a technical team including information scientists, systematic reviewers, analysts and health economists and has been scrutinised by a guideline development group (GDG) of clinicians and patients. The evidence presented to them (and available for all in the Appendix) is grouped by preventative strategy, by patients and settings and by outcome (death, fatal PE, all PE and symptomatic and asymptomatic deep vein thrombosis).

Remarkable though it may seem, in spite of this wealth of evidence there are things we would very much like to know that are simply not there. With respect to outcomes, there are relatively few studies large enough for fatal PE to occur with sufficient frequency to provide statistically significant results. Triallists prefer large homogeneous populations so some important groups have never been studied. Patients with a propensity to bleed or to thrombose are usually protocol exclusions from randomisation. While in early studies there were no-treatment arms, later studies have had to randomise a new strategy against a pre-existing one. The GDG has tried to take the total of all the evidence and extrapolate or interpolate to cover the settings, comparisons or outcomes that are not in the evidence tables.

We believe that with due caution and a wide knowledge this provides the best estimate on which to base advice. But some individuals respond to these "holes" in the evidence as a justification for taking their own view since there is "no evidence" in that specific instance.

What we do know is that it is only natural to change practice on the basis of a bad experience. This is a deeply ingrained protective response. It has been studied with regard to clinicians' responses to bleeding and embolism in the not dissimilar context of lone atrial fibrillation and anticoagulation to prevent the risk of stroke. A single episode of bleeding makes doctors less likely to protect subsequent patients from stroke. However the occurrence of stroke where they failed to anticoagulate did not engender a change in practice.[4] Applying the strategy that produces the best overall benefit taking into account VTE and bleeding in all patients is not something that can be computed by individual doctors. Guidance may not be perfect but we believe that to follow it rather than ignore it is the safer course. It should be audited and where the existing evidence proves to be inadequate, let us find more.

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> "VTE is a significant international patient safety issue."
>
> **Sir Liam Donaldson, Chief Medical Officer**

> In order to make progress on saving thousands of lives every year, I have also asked Dr Thomas to lead the next phase of this important work…. to date, the prevention of VTE has remained unaddressed in too many of our NHS hospitals. I expect this [expert] report to be a milestone in developing a systematic approach to preventing VTE in all healthcare systems.
>
> **Sir Liam Donaldson, Chief Medical Officer**

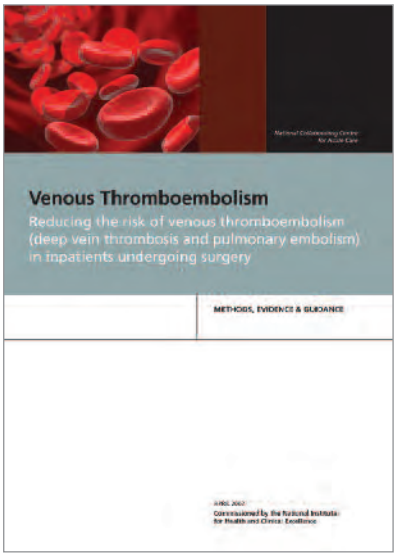


Fig 1
Anticoagulant self-injection training plays an important role in providing thromboprophylaxis in the community.

Fig 2
The NICE clinical guideline (CG46) on reducing the risk of VTE in inpatients undergoing surgery was published in April 2007.

Fig 3
Correctly fitted compression stockings are important for optimal efficacy in preventing VTE.

BIOGRAPHY

Professor Tom Treasure has been surgeon working in London since 1982. He has worked with NICE on lung cancer guidelines and venous thromboembolism. He also chairs the National Confidential Enquiry into Patient Outcome and Death and Wellcome's Humanities Strategy Committee. He leads on national cancer surgery randomised trials of mesothelioma and metastasectomy. Since 2007 he has been based at the Clinical Operational Research Unit in UCL's Department of Mathematics.

The Exemplar Centre Network

Dr Roopen Arya, Director of the King's Thrombosis Centre, King's College Hospital NHS Foundation Trust

The Exemplar Centre Network initiative forms a key component of the National VTE Prevention Programme. Soon after the publication of the VTE Expert Working Group report in April 2007, the Chief Medical Officer established an Implementation Working Group, tasked with implementation of national VTE strategy across England, including the identification of VTE Exemplar Centres.

The Exemplar Centre Network

These demonstration sites are selected because of an existing track record of excellent VTE prevention and care, and provide an expanded role, including education, audit and quality control. King's College Hospital (in the NHS) and the London Clinic (representing the independent sector) were instituted in 2007 as the first Exemplar Centres. They were joined by six further trusts in 2008, and the network is being expanded further in 2009 (Figure 1). Recently the South West Strategic Health Authority (SHA) was named the first exemplar SHA and aims to ensure VTE risk assessment in all its hospitals, explore better VTE metrics and develop a holistic approach to VTE prevention.

It is anticipated that up to 20 hospitals will be designated as exemplar by the end of 2010, forming a diverse and enlightened network of centres of excellence in VTE care. Under this 'kitemark' for good practice in VTE care, the centres share examples of good practice such as clinical best practice and educational and audit material, provide advice regarding VTE care, receive visitors and collaborate on clinical research into VTE. Innovative VTE prevention practices being developed within the Exemplar

Centre Network include the use of electronic risk assessment and e-learning modules, inclusion of VTE risk assessment as a key performance indicator in Trust clinical scorecards and development of VTE Link Nurses as ward champions. The network can also provide help and advice in relation to managing VTE prevention locally such as establishing hospital thrombosis committees.

Exemplar Centre Network activities

Exemplar Centre website

The Exemplar Centre website, hosted by the King's Thrombosis Centre, was launched in late 2008 (Figure 2). The web resource provides an easy way for other sites to access exemplar materials. With many thousands of hits, the website has proven a great success in the drive to implement the National VTE Prevention Programme.

1st National VTE Exemplar Centre Study Day

This one-day programme took place in March 2009 and included formal presentations, interactive real-life case scenarios and opportunities for lively discussion (Figure 3). The purpose of this event was to raise awareness of the risk of VTE in hospitalised patients, including strategies to reduce this risk, enhance patient safety and improve quality of care. Speakers included senior nurses, consultants, Primary Care Trust Medical Directors and Trust Chief Executives who examined the challenge of VTE prevention from diverse perspectives.

> VTE is a serious issue requiring immediate attention where rapid progress can be made in improving patient safety.
>
> **Dr Anita Thomas OBE, Chief Medical Officer's VTE Implementation Working Group**

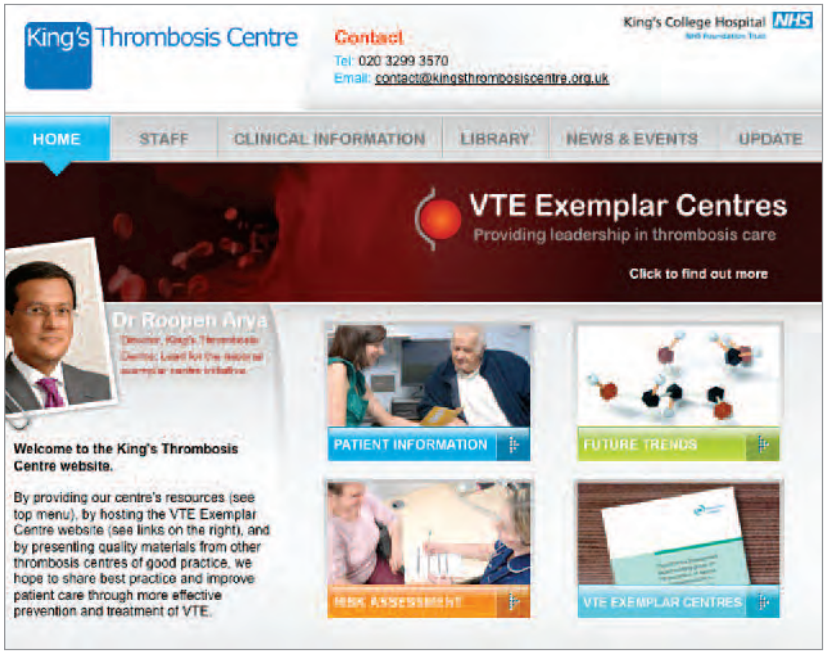


Fig 1
Location of VTE Exemplar Centres, both current (labelled) and prospective (unlabelled). This nationwide network of Exemplar Centres aims to promote and develop best practice in VTE prevention.

Fig 2
The King's Thrombosis Centre website provides a central resource for VTE prevention, offering a repository of VTE prevention-related materials and hosting the VTE Exemplar Centre Resource Centre. The aim of the website is to share best practice to improve patient care through more effective prevention and treatment of VTE. The website can be accessed at www.kingthrombosiscentre.org.uk or via the Department of Health website at http://www.dh.gov.uk/en/Publichealth/Healthprotection/Bloodsafety/DH_082132.

Fig 3
Representatives from the Exemplar Centre Network met at the 1st National Exemplar Centre Study day in March 2009 to discuss the challenge of VTE prevention.

BIOGRAPHY

Dr Roopen Arya was awarded a Bachelor of Medicine and Surgery at Oxford University and later graduated with a PhD in Molecular Medicine from the University of London. He is a Fellow of the Royal College of Physicians and the Royal College of Pathologists.

He leads the Anticoagulation & Clinical Thrombosis Services and the Blood Sciences Laboratory at King's. VTE care and prevention is a particular interest: he is on the steering committee of the VTE registry 'VERITY' and was member of the 'Prevention of VTE in Hospitalised Patients' Independent Expert Working Group. He is currently the member of the VTE Implementation Working Group with a responsibility for developing exemplar sites for VTE prevention and management, King's College Hospital being the first such Exemplar Centre in the NHS. He heads an active programme of clinical research into VTE including studies of risk assessment, VTE outcome, prothrombotic effects of HRT and thrombophilia in the black population.

e-Learning venous thromboembolism

Mr Alan Ryan, National Programme Director, e-Learning for Healthcare

e-Learning supporting the national strategy

In April 2007, following the publication of an expert group report on the prevention of venous thromboembolism (VTE), the Chief Medical Officer, Sir Liam Donaldson, launched a National VTE Prevention Strategy in England. Led by Dr Anita Thomas OBE, a key element of this national strategy is the "improvement of public and professional understanding of VTE at a national level, through improved communication of information to patients and the public, accompanied by improved and coordinated programmes of professional education".

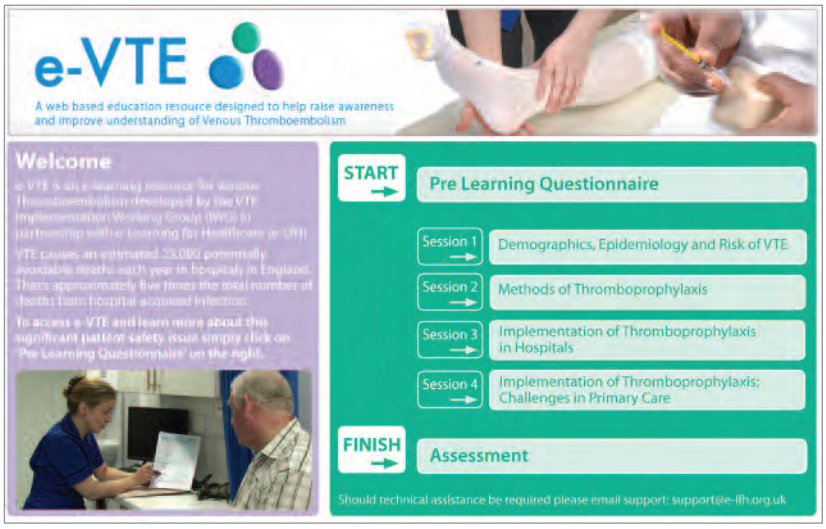
In response to this Anita and her team collaborated with e-Learning for Healthcare (e-LfH), a Department of Health programme, to develop an e-learning resource for VTE.

Why e-Learning?

e-Learning has many advantages, including:

- Learning can be accessed whenever and wherever there is an Internet connection, both in the UK and abroad
- The teaching materials provided can be used at a consistent and national level
- It is cost-effective, removing the need to travel to a classroom
- The content can be updated quickly and easily so that it is continually fresh and current.

e-Learning for Healthcare is an award-winning provider of e-learning content. Working in partnership with the NHS and professional bodies, e-LfH offers quality-assured healthcare training across the UK and is now delivering over 30 e-learning projects across a wide range of medical specialties. Operating in conjunction with existing resources and curricula, all of the e-learning material delivered by e-LfH is written by national and international experts and is extensively peer-reviewed before being accessed by the learner.



The sessions of learning are engaging and interactive, using quality imagery, video, audio and animation and the content is presented through 'real life' scenario-based sessions, case studies and 'knowledge bites'.

e-VTE (e-Learning venous thromboembolism)

Available for free to anyone with an interest in VTE prevention, e-VTE is designed to raise awareness and improve understanding of VTE within the clinical community, the hospital setting in particular, and to address the challenges VTE prevention presents in the primary care setting.

The e-Learning will help clinicians to take appropriate action in assessing the risk of VTE for an individual and advising appropriate preventative measures. e-VTE consists of a pre-learning questionnaire and a post-learning assessment together with four sessions of e-learning:

1. Demographics, epidemiology and risk of VTE
2. Methods of thromboprophylaxis
3. Implementation of thromboprophylaxis in hospital
4. Implementation of thromboprophylaxis: challenges in primary care.

Other VTE-related modules may be published as part of e-VTE in the future. For more information on e-VTE visit www.e-lfh.org.uk/vte.

Accessing e-VTE

The e-VTE course is accessible at www.e-vte.org.

> “... much original research on VTE and the modern era of understanding the prevention and treatment of VTE began with work in the NHS in the 1970s.”
>
> **Dr Anita Thomas OBE, Chief Medical Officer's VTE Implementation Working Group**

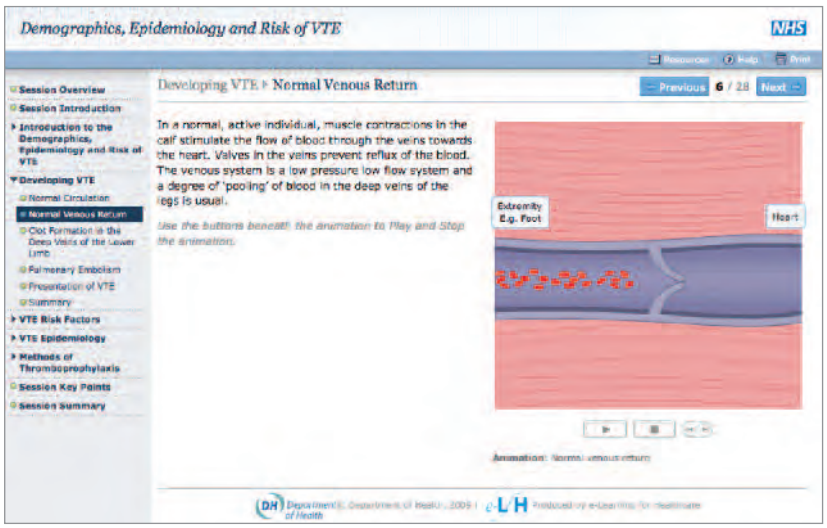


Fig 1
The e-VTE launch page.

Fig 2
The learner's existing and newly acquired knowledge is tested with an interactive drag and drop question exercise.

Fig 3
Animation helps to illustrate the key learning points of e-VTE.

Fig 4
e-VTE uses video to enable the learner to see clearly how treatment should be administered.

BIOGRAPHY

Mr Alan Ryan is the National Programme Director for e-Learning for Healthcare and has responsibility for the delivery of the e-LfH programme. Previously he has held the position of the National Project Director for the Radiology Integrated Training Initiative and National Project Director for Modernising Medical Careers. He has also worked as a programme manager for the National Clinical Governance Support Team (NCGST) responsible for London and Cumbria.

Alan is a native of Clonmel, Co. Tipperary, Ireland, came to England to train as a nurse and before joining the NCGST, worked in a number of senior nursing positions in London.

Venous thromboembolism prevention from the nursing and midwifery perspective

Mr Gerry Bolger, Programme Director, Chief Nursing Officer's Professional Leadership Team, Department of Health

The role of nursing and midwifery in the provision of care is both well documented and established across the world. In the UK, we have over 600,000 registered nurses and midwives on the Nursing & Midwifery Council's register.

The recent *High Quality Care for All* outlined that "quality is the organising principle" in the next era of NHS delivery.[1] It goes on to explore the role of nursing and midwifery in the delivery of high-quality care in all care settings, recognising the valuable role that nurses, midwives and the wider nursing family have to play in care delivery. The shift of care provision from acute hospital to community and primary care is underpinned by the roles that nurses play in healthcare now and in the future.

The Chief Nursing Officer, Dame Christine Beasley, produced a vision document *Framing the Nursing and Midwifery Contribution*[2], which outlines the roles of nurses and midwives and the educational framework required to deliver care in the 21st century. In it she states: "We know that nursing and midwifery are fundamental to high quality health care … there is hardly an intervention, treatment or health care programme in which we do not play an important part".

Nurses and midwives are essential to the assessment and early detection of problems in health. They recognise and identify many health problems, for example, diabetes in patients who are unaware of the problem through routine testing and history taking. They deliver care in a wide variety of settings, from the individual's home to hospital, in prisons and in army field hospitals, because care is needed everywhere.

And as professionals have an ethos of holistic care, they have a key role in early identification of actual or potential problems.

Because of this, the professions in particular have a role in the early identification of patients with venous thromboembolism (VTE). With the correct training and risk assessment tools, they can assess patients and clients with potential risk factors and then implement appropriate good practice prophylactic interventions or treatments. Nurses and midwives are essential to the ongoing assessment of patients undergoing interventional treatments such as surgery to identify further risk factors and act in partnership with the multidisciplinary team.

The widening of practice, especially around prescribing of medicines both as part of locally agreed protocols and as independent prescribing, allows nurses and midwives to support patients in a variety of care settings from the ward to the home. The outcome of practice is to reduce the impact that VTE has on the population and reduce, where possible, the number of deaths.

The vision would be that VTE risk assessment and prophylaxis would become the norm in the future as part of all nurses' and midwives' ongoing practice. This will mean support from other healthcare colleagues and training to ensure that nurses work collectively with other professionals in a multidisciplinary team to ensure that early identification and detection becomes possible for all in all care settings. Nurses and widwives want the best care for their patients. The work on VTE recognition, management and leadership means that nurses will take an active role in the assessment, planning and implementation of care of patients suspected of, or having, VTE.

REFERENCES

1. *Next Stage Review - High Quality Care for All.* Department of Heath, 2008
2. *Framing the Nursing and Midwifery Contribution.* Department of Health, 2008

> "Nurses are at the centre of a national strategy to reduce deaths from Venous Thromboembolism (VTE) … evidence suggests that receiving a VTE risk assessment on admission to hospital, followed by appropriate prophylaxis, has the potential to significantly reduce death from VTE. Nurses are key to this process because in many hospitals they are the ones carrying out initial risk assessments."
>
> **Mr Tim Brown, Policy Advisor for the National VTE Prevention Strategy in England, The CNO Bulletin, 2009**

> VTE is a common event in medical patients, and protocols for risk assessment of VTE are significantly less established for medical than for surgical patients.
>
> **Dr Anita Thomas OBE, Chief Medical Officer's VTE Implementation Working Group**

Fig 1
Nurses have a particular role in the implementation of appropriate prophylactic interventions.

Fig 2
Nurses are key to VTE risk assessment; in many hospitals, nurses are the healthcare professional that performs the initial risk assessment.

BIOGRAPHY

Mr Gerry Bolger is currently the Programme Director for the Quality in Caring work within the Chief Nursing Officer's team at the Department of Health, leading the key indicators and standards for nursing. Formerly he led Hospital at Night across England. He has over 22 years' NHS experience working at operational, senior management and board level as an Interim Director of Nursing. He also led work on reviewing the use of temporary staffing across the profession for the SHA.

As well as holding a nursing registration, Gerry has a Masters' in Health Management. He is active within the Royal College of Nursing and is on its governing Council. He has an interest in nursing leadership and e-health.

The pharmacist's role in venous thromboembolism prevention

Mr Martin Stephens, National Clinical Director for Hospital Pharmacy

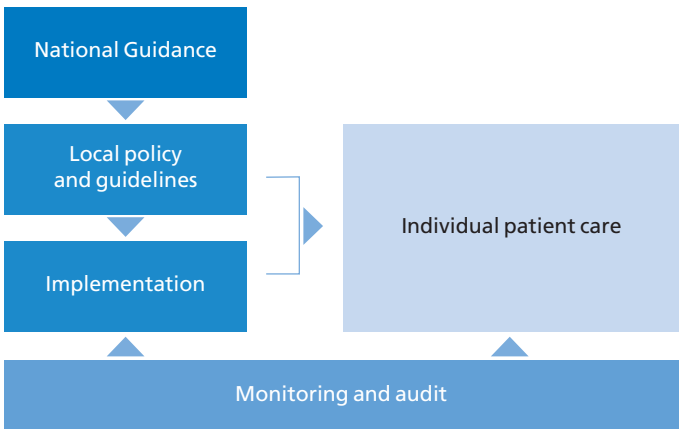
Implementing venous thromboembolism (VTE) risk assessment and thromboprophylaxis measures appropriately and consistently requires whole healthcare team effort, in partnership with patients. The focus of this chapter is the particular contribution pharmacists and their teams can make.

Pharmacological prophylaxis is central to VTE prevention and it is clear that the pharmacy team will support the selection of an appropriate product for local use, and then ensure its safe and effective purchase and distribution. However, the pharmacist's role goes beyond product choice and can significantly support local VTE prevention programmes.

The Figure gives a simplified version of the process of getting national evidence-based policy into local practice. At the level of local guideline development, pharmacists can contribute to the synthesis of evidence and national guidelines, ensure documents are fit for purpose and help the passage through local approval processes – such as Drug and Therapeutic Committees.

Implementation can be supported at a local level by designing prompts into medicine charts regarding risk assessment and prescribing mechanical and/or pharmacological measures. Pharmacists can contribute to education and training programmes for the healthcare team, with a particular focus on pharmacological issues and questions that may arise about concurrent prescribing.

Ensuring the local guidance is applied appropriately to individual patients is another important aspect of pharmacy's contribution. Part of the regular review of inpatient therapy should be to check that risk assessment has been undertaken and that the appropriate prescription – right medicine, right dose – has been written. This would be undertaken just after admission but with further checks during the inpatient stay where required; it sits alongside the medicines reconciliation process required to ensure the patient's inpatient regimen is properly informed by the medicines they were taking at home. Pharmacist involvement at the pre-admission stage is becoming more common – supporting management of the medicines regimen for their elective stay.



Pharmacists who have been appropriately trained and are registered to do so can prescribe thromboprophylaxis, acting as a positive role model for junior medical staff. In this, or in their review role, pharmacists can support the ongoing education and development of others in the healthcare team by feedback and discussion. Pharmacists and their teams also have a vital role in discussing medicines with patients, ensuring they understand how to use them safely and to best effect; this will be during inpatient stay and in preparation for discharge.

The pharmacy team can support an important aspect of safe care: at discharge, ensuring information on the medicines being used and those that have been discontinued is conveyed accurately and in a timely way to the primary care team. This is pertinent to VTE prevention where pharmacological thromboprophylaxis may: a) be discontinued at discharge or b) be extended for a fixed period post discharge.

The pharmacy team can also support the monitoring of local guideline implementation, supporting clinical audit and routine review of compliance with guidance. There are examples of continuous monitoring of compliance over a number of years at Exemplar Centres and other sites.

The pharmacy team are an important resource to mobilise to ensure we protect patients from VTE.

> We expect thromboembolism (VTE) risk assessment policy to be adopted throughout the NHS.
>
> **Ann Keen MP, Parliamentary Under-Secretary of State for Health Services**

Fig 1
A pharmacist supports an important aspect of safe care: at discharge, ensuring information on anticoagulation is conveyed accurately and in a timely way to the patient.

Fig 2
Pharmacological prophylaxis is central to VTE prevention and it is clear that the pharmacy team will support the selection of an appropriate product for local use, and then ensure its safe and effective purchase and distribution.

BIOGRAPHY

Mr Martin Stephens took on the role of National Clinical Director for Hospital Pharmacy with the Department of Health in December 2008. This is a part-time role; he continues as Associate Medical Director for Clinical Effectiveness and Medicines Management at Southampton University Hospitals NHS Trust in the remaining half of his week. Before this Martin had been Chief Pharmacist at Southampton since 1997 and Clinical Director for Diagnostics and Therapy since 2006. At Southampton, Martin chairs the thrombosis committe and in his national role has been supporting pharmacist engagement in thromboprophylaxis programmes.

A patient perspective on venous thromboembolism

Ms Eve Knight, Co-Founder and Chief Executive of AntiCoagulation Europe

With the publication of the NICE clinical guidelines on reducing the risk of venous thromboembolism (VTE) in inpatients undergoing surgery and the 'Dear Colleague' letters from the Chief Medical Officer (CMO) recommending every patient admitted to hospital should have a VTE risk assessment, significant progress has been made in reminding healthcare professionals in England and Wales of their role in reducing mortality and morbidity from VTE through effective awareness, education, risk assessment and management.

In addition, the report of the independent expert working group on the prevention of VTE in hospitalised patients made clear recommendations that improvement of the public understanding of VTE was also necessary at a national level, through improved communication of information to patients and the public.

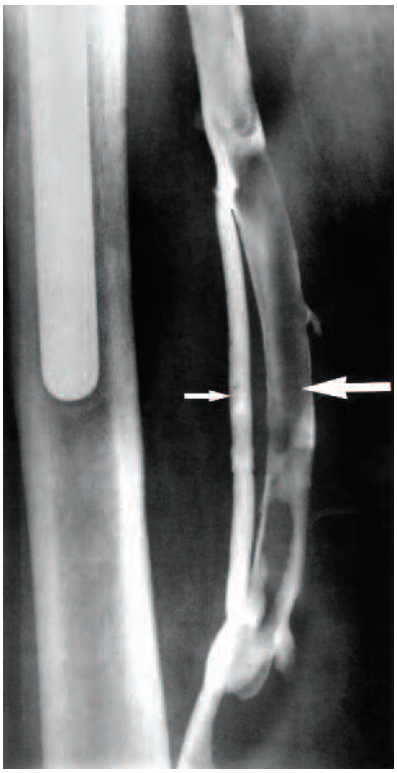
However the All-Party Parliamentary Thrombosis Group's annual audits of Acute Hospital Trusts in 2007 and 2008 revealed worrying disconnects in practice; the 2008 audit demonstrated that although awareness of the CMO's recommendations and the NICE clinical guidelines on the prevention of VTE was 99%, only 70% of Trusts reported undertaking a documented risk assessment, and only one in four (24%) Trusts offered all patients information on the risk of thrombosis on entering hospital. Patients who contact AntiCoagulation Europe (ACE) for information and support often speak of how frightened they were when they were diagnosed with a blood clot and their utter incomprehension of the consequences – whether it was a pulmonary embolism (PE) that landed them in intensive care or lifelong pain and disfigurement from post-thrombotic syndrome following a deep vein thrombosis (DVT). Patients are increasingly (and some would say, rightly) angry at their ignorance of the simple list of risk factors that could have alerted them to a predisposition for either themselves or their loved ones to VTE. At ACE we believe that in addition to understanding these risk factors, at the very least, patients should be made aware of the signs and symptoms of DVT and PE, the role and correct use of thromboprophylaxis and the implications of not having an adequate risk assessment and appropriate prophylaxis.

In our experience, good quality, consistent education plays a vital role in helping patients to take responsibility for their own health and improves relationships with the professionals who care for them – both of which we believe will help reduce the risk of VTE.

Furthermore, ACE believes that raising public awareness of VTE will help create sustainable change with minimal investment – in fact our recent Stop The Clot campaign piloted in 29 of the 30 East of England and East Midlands Hospital Trusts helped provide the impetus to review and/or improve local VTE prevention strategies. In addition, the campaign demonstrated that raising public awareness in the local media can help promote good news stories for Trusts.

Safeguarding the wellbeing of all patients must remain the motivation for continued national improvements in the management of VTE risk. For example, risk assessments should not merely be limited to a hospital setting as primary care is surely perfectly positioned to play a role, and an effective, failsafe mechanism for passing on risk assessment information when a patient is referred is long overdue. For this reason, ACE has drafted a patient pathway (www.anticoagulationeurope.org) which highlights every opportunity for reinforcing education and prompting action to reduce the risk of VTE wherever and whenever patients come into contact with the healthcare system.

Only by closing the gaps where vulnerable patients could slip through the net will we be able to have any impact on the reality that VTE remains the number one cause of preventable death in hospitalised patients in this country.



> Currently, at the request of the chief medical officer, Dr. Anita Thomas OBE and her team are visiting throughout the National Health Service to discuss with senior managers and doctors their strategies for implementing venous thromboembolism (VTE) risk assessment in their hospitals. In monitoring compliance with the Department's VTE risk assessment policy we will take into account the findings from this programme of visits and any information available from other sources, such as the All-Party Parliamentary Thrombosis Group.
>
> **Ann Keen MP, Parliamentary Under-Secretary of State for Health Services**

Fig 1
A deep vein thrombosis (large arrow in figure) can have a devastating effect on a patient's quality of life.

Fig 2
Safeguarding the wellbeing of all patients must remain the motivation for continued national improvements in the management of VTE risk. This should not be limited to the hospital setting, as primary care is perfectly positioned to play a role in VTE risk assessment and prophylaxis.

BIOGRAPHY

Ms Eve Knight has worked in the charity sector for over twenty years. She is Co-Founder and Chief Executive of the leading thrombosis charity AntiCoagulation Europe, working to prevent thrombosis and providing advice, information and support to people on anticoagulation and antiplatelet therapy. Her remit includes making sure that there is a patient and carer perspective at all levels of service provision and to influence the political agenda where necessary.

Eve is a member of several groups including The International Self Monitoring Group of Anticoagulated Patients and the Medical Technology Group. She is a Section Editor for the British Journal of Cardiology and the British Journal of Primary Care Nursing.

Eve has been a member of several boards and committees including the Government Modernisation Board for the NHS, The External Advisory Group for the National Service Framework for Coronary Heart Disease, The National CHD Task Force and The Refractory Angina Guideline Group.

She has diplomas in sociology and health psychology.

Visit the AntiCoagulation Europe website at www.anticoagulationeurope.org

Commissioning for venous thromboembolism prevention

Dr Jim Gardner, Medical Director and Professional Executive Chair, North Lancashire Primary Care Trust

In England, Primary Care Trusts (PCTs) are the principal commissioners of healthcare. They manage the majority of the budget for the delivery of community, primary and secondary care. They have a statutory duty to manage the delivery within a set budget and two principal objectives: to improve the health of the population and to address health inequalities.

Seen in this context, a disease process such as venous thromboembolism (VTE) should be a natural area of focus for commissioning PCTs: It accounts for a significant amount of preventable morbidity and mortality; each of the preventable incidents has a substantial human and financial cost (secondary care data from CHKS[1] for our population in 2008 shows 161 episodes of hospital-acquired VTE with a mortality of 14%, extended length of stay and increased costs to the system of over £1 million); and a welcome focus on safety and quality drivers to prompt PCTs to intervene, rather than leaving providers to address the problems in-house. In this respect, the comparisons with healthcare-associated infections (HCAIs) are obvious. Similarly, the lessons PCTs have learned in commissioning to reduce the prevalence of HCAIs are transferable.

Like quality and safety in health generally, VTE is a whole-systems issue. Every part of the local health economy has a part to play and the commissioner needs to understand this and reflect it in its approach. Thus, identifying at-risk populations (needs assessment), raising awareness and understanding (education and social marketing), gathering and improving data, benchmarking, standard-setting, contracting, innovating, governing and researching are all important parts of the whole. Clearly then there is a complexity to commissioning to reduce VTE, many stakeholders are involved and at PCT level a project manager to co-ordinate the process is desirable.

As PCTs work towards becoming world class commissioners[2], they will take an increasingly systematic approach to conditions such as VTE, raising awareness and interest at all levels of the system: board to board, PCT executive team to provider executive teams, clinical leaders to clinical leaders, Practice Based Commissioners, GPs, community nurses, patients and carers. A role for clinical leadership here is to embed the issue within the mainstream thinking of the health economy.

The Provider Contracts for 2009 and subsequent years present profound opportunities to improve quality and safety by embodying the key issues and standards in formally agreed documentation. The complementary approaches of incentives for high performance ('carrots') as exemplified in NHS North West's Advancing Quality (AQ) Programme[3] and disincentives for substandard performance ('sticks') in the Department of Health's 'Commissioning for Quality and Innovation (CQUIN)' programme[4] can both be brought to bear. Thus, in North Lancashire we have used an AQ approach to support our secondary care providers in introducing VTE risk assessment for all admitted patients, improving data recording, running compliance audits and presenting root cause analyses for any secondary acquired cases of VTE. And we have used the CQUIN approach to promote information sharing and 'Map of Medicine' compliant pathway re-design.

At primary care level, our Practice Based Commissioners are redesigning the GP management of patients with suspected established deep vein thrombosis (DVT). Using the Map of Medicine as a reference and mindful that there are over 140,000 referrals to hospitals in the UK for 'suspected DVT' in any year, with over 80% not having a confirmed DVT[5], the introduction of primary care risk assessment and near patient testing plus evaluation of the effectiveness and cost-effectiveness of the initiative is seen as a favourable development in our geographical area.

In summary, commissioning for VTE prevention requires a whole-system approach. Understanding the idiosyncrasies of the local health economy within the national and international context, utilising a wide variety of skills and influences and bringing a range of stakeholders on board are all necessary. However, the prize is substantial and would seem to be core business for aspirant world class commissioners.

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1. NHS North Lancashire has a contract with CHKS Ltd to provide secondary care data.
2. *World Class Commissioning: Vision*. Department of Health. December 2007
3. www.advancingqualitynw.nhs.uk
4. *Commissioning for Quality and Innovation (CQUIN)*. Department of Health. December 2008
5. Büller HR, Ten Cate-Hoek AJ, Hoes AW, et al. Safely ruling out deep venous thrombosis in primary care. *Ann Intern Med* 2009;150:229–35

> The Department of Health and Government must be congratulated for their efforts to date. However, we call on Government to make risk assessment and management of hospital-acquired VTE compulsory by including it in the NHS Operating Framework and measuring Trusts' compliance annually in the CQC periodic reviews. This is a recommendation endorsed by the majority of Trusts who respond to our annual survey.
>
> One consultant told us that VTE risk assessment "would be many times more relevant than many of the 'standards' currently in the Operating Framework".
>
> **John Smith MP, Chair, All-Party Parliamentary Thrombosis Group**

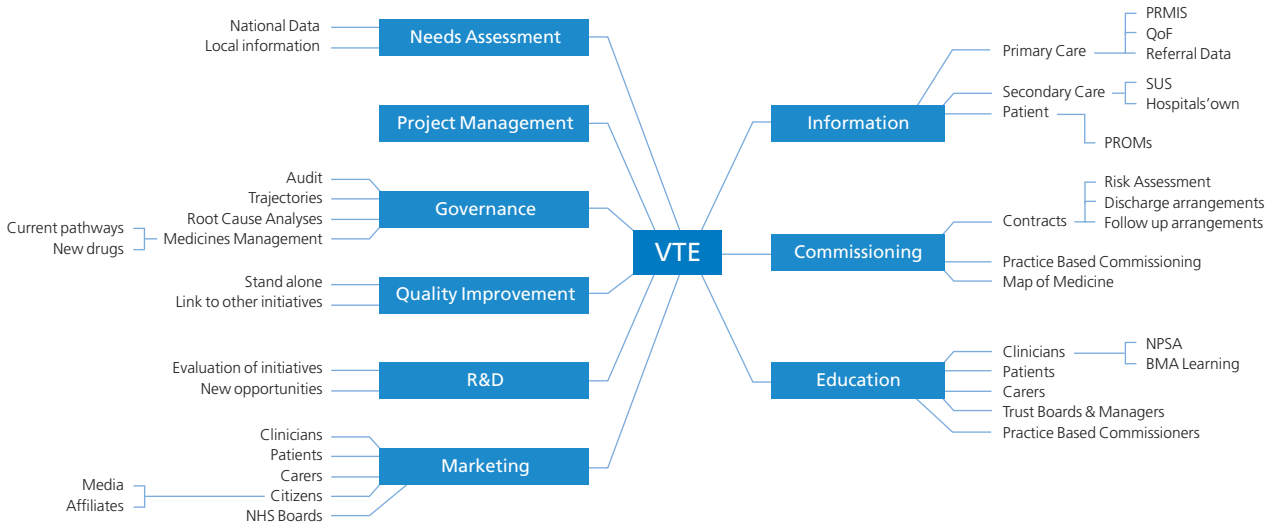

Fig 1
Mind map of issues to consider as a commissioner.

Fig 2
Ultrasound forms a key component of the diagnostic pathway for VTE.

BIOGRAPHY

Dr Jim Gardner studied medicine at Cambridge University and Guy's Hospital, London. After junior doctor posts in London and Sydney, Australia, he completed GP training in Cumbria. He became a Partner in a high-performing GP practice in Kendal for 12 years. During this time he developed interests in health service management and service re-design. He was the founder chairman of a successful GP out-of-hours co-operative, chair of a local health group and worked as a GP with Special Interest in Public Health after the completion of a public health fellowship.

Jim left his GP practice in 2007 to join NHS North Lancashire as Medical Director and Professional Executive Chair. Jim continues to work one day per week as a GP and is also a Health Foundation Leadership Fellow.

A regional approach to venous thromboembolism prevention

Dr Mike Durkin, Medical Director, South West Strategic Health Authority

There often comes a point in time when you have realised that the solution to one of your tasks has been right in front of you.

I had been asked to join the core team of the Patient Safety Campaign for England, which had been noted as a key task for the NHS in Safety First[1], and I was asked by Alisdair Flowerdew, Medical Director at Salisbury Hospital NHS Trust, to deliver a talk on the aims and aspirations of the campaign which became Patient Safety First. At the same time I was becoming increasingly frustrated by the lack of pace of change in aligning our system-wide patient safety improvement programme. In order to get real traction with the clinical community we needed to create an engaged leadership model that allowed for difference but offered true scrutiny of clinical interventions or pathways.

Prior to my talk I was lucky enough to hear an address from Anita Thomas on her work with the CMO VTE Implementation Working Group. I realised then that we could deliver a large-scale change for the 5.2 million people of the South West that would reduce needless loss of life, would reduce the need for hospitalisation and would create a sustainable vehicle for clinical engagement that would act as a model for future system changes.

The metrics are hard to quantify but we can estimate that more than 2500 patients die each year from venous thromboembolism (VTE) in the South West, which covers a large geographical area and has within it 40 NHS organisations. It was not difficult to ask the South West Strategic Health Authority to become committed to reducing avoidable death and long-term disability from VTE as part of its wider work to improve the quality and safety of services within the South West.

I persuaded Anita Thomas to Chair a Steering Group for the VTE Prevention Initiative. We then set about constructing a work programme that would deliver in determined fashion the intention that by providing a practical approach to implementation of national guidance all hospitals in the South West would be able to demonstrate systematic approaches to VTE prevention.

The steering group agreed that the scope of the initiative needed to include:

- A focus on risk assessment of all hospitalised patients. This would be the initial focus of the initiative, involving all acute trusts and independent-sector treatment centres before moving on to community hospitals

- Exploring better methods of measuring VTE

- Researching and developing preventative methods within non-hospital settings, such as nursing homes, as there is very little evidence on the effective preventative interventions in these settings.

The initiative sits within the implementation plan for the NHS South West Strategic Framework and the prevention of VTE within the NHS South West Quality Metrics database is also being explored. The initiative is supported by three distinct groups:

Steering Group, which will oversee all phases of the initiative.

Peer Review Team, which will carry out the site visits as part of the initial focus on risk assessment of hospitalised patients. Alistair Flowerdew, currently Medical Director at Salisbury (which has been named as an Exemplar Centre) leads the peer review team and participates in all the visits. This team is managed by Julie Branter (Associate Director for Clinical Governance and Patient Safety), and is made up of clinicians from across the South West from a number of specialties.

Expert Reference Group, which operates virtually and provides wider advice and guidance to the Steering Group throughout the initiative.

Timeline for initial phase of the initiative

Dec 2008/Jan 2009
Questionnaires issued to all acute trusts

February – April 2009
Analysis of questionnaires and planning of visits

Late April – early June 2009
Peer review team visits to all acute trusts

June/July/August 2009
Write up and feedback

September 2009
Clinical Summit marks the end of the first phase and will determine what more needs to be done

October 2009
Report on initiative to Strategic Health Authority

Questionnaires were issued to all acute trusts and were designed to gather baseline information on the approach being taken to VTE prevention within NHS South West hospitals. All Trusts responded within the deadline and a detailed analysis of the responses was carried out. Following analysis of the responses, improvement review visits

> "The total costs of managing deep vein thrombosis within the NHS are estimated to be £640 million [annually] so it not only makes good clinical sense to prevent patients suffering from hospital-acquired VTE but the NHS could save a lot of money in the process by avoiding costly long-term health complications."
>
> **John Smith MP, Chair, All-Party Parliamentary Thrombosis Group**

began. The format for these visits was designed to review the systematic approach to VTE prevention.

Our lessons to date are:

- The monitoring of compliance with risk assessment is variable: 10 of the 13 hospitals undertaking risk assessment also undertake audit
- The capturing of data is variable with two hospitals using an electronic data capture system for in-hospital VTE
- Trusts identified barriers to measurement that need to be examined more closely
- Risk assessment of patients is not being undertaken consistently across the South West; this is exemplified across the emergency and elective pathways
- Where risk assessment is incorporated into existing documentation, eg clerking proformas and post-take ward round checklists, more reliable process has been seen
- Where policies exist there need to be clearly defined roles and responsibilities for all staff groups
- There has been an inconsistent approach to extended prophylaxis, which supports the further development of extended pathway management
- Measurement of outcomes is ad hoc
- Where there is frequent audit of process, this has driven improvement in the risk assessment process
- Audit results need to be fed back to clinical teams

I am now even more convinced than before the start of this initiative that there is a needless loss of life because clinicians and organisations are not following simple evidence-based interventions.

We must now move into a quality improvement model to ensure that organisations support this change and we must continue to challenge all clinicians who are disregarding current advice that will prevent VTE.

REFERENCES

1. *Safety first: a report for patients, clinicians and healthcare managers.* Department of Health. December 2006.

BIOGRAPHY

Dr Michael Durkin is Medical Director of the South West Strategic Health Authority having been appointed in 2006; he has particular responsibility for clinical quality and patient safety, and clinical leadership across NHS South West which serves a population of 5 million.

Mike qualified at The Middlesex Hospital and has held research and teaching appointments in London and Bristol. He was appointed to the faculty at Yale University School of Medicine, USA, where he has also been an Attending Anaesthesiologist. He was Medical Director of Gloucestershire Royal NHS Trust from 1993 to 2002, where he has a consultant post in Anaesthesia, and was appointed as Medical Director and Director of Clinical Quality for Avon, Gloucestershire and Wiltshire Strategic Health Authority in 2002.

In 2001 he became Advisor to the National Leadership Development Programme for Clinical and Medical Directors and has continued to support the delivery of these programmes across Trusts and Strategic Health Authorities in England. He has introduced mentoring training programmes for NHS Trusts and Medical Directors.

He has led clinical performance and governance reviews for Royal Colleges and in NHS and independent hospitals in the UK, for other SHAs in England and in 2003/04 for a Ministerial Review in Gibraltar. In 2006 he was appointed to act as the External Medical Advisor to the Regulatory and Quality Improvement Authority in Northern Ireland. In 2007 and 2008 he led a major investigation into the governance arrangements for symptomatic breast disease and pathology services in the Republic of Ireland for the Health Information and Quality Authority. He is a member of the core team for the Patient Safety Campaign for England as an advisor on leadership interventions.

Australia's approach to venous thromboembolism prevention

Dr Susan M Phillips, Interim Executive Director National Institute of Clinical Studies, National Health and Medical Research Council, Australia

Venous thromboembolism (VTE) is a significant problem for hospitalised patients in Australia, as it is internationally.[1] In response to this, the National Health and Medical Research Council (NHMRC) through its National Institute of Clinical Studies is currently implementing a VTE Prevention Program that includes multiple strategies aimed at overcoming barriers to best practice at different levels within the healthcare system.

At the national level, the NHMRC has engaged peak organisations such as the National Prescribing Service and the Australian Commission on Safety and Quality in Health Care (ACSQHC) to support their effort to improve VTE prevention by advocating the development of VTE prophylaxis training modules for medical undergraduates and national VTE risk assessment and indicators to measure hospital performance. At the State and Territory level, the NHMRC has advocated for quality and safety initiatives to support hospital-based improvement programs.

During 2005–2007, the NHMRC implemented a public hospital programme co-sponsored by State and Territory health authorities to test and improve change strategies across multiple sites and jurisdictions. The programme adopted a whole-of-hospital approach and implemented active change strategies informed by the findings of a systematic literature review commissioned by the NHMRC on effective interventions to improve VTE prophylaxis in hospitalised patients.[2] The Table describes the barriers to effective thromboprophylaxis and the strategies used to overcome these by participating hospitals.

The public hospital programme resulted in 21% absolute improvement in compliance with VTE prophylaxis in high-risk patients, from 55% median compliance at baseline to 76% at the end of the programme. Other key achievements included the development of whole-of-hospital thromboprophylaxis policies in 83% of participating hospitals (39% at baseline) and 89% of hospitals establishing explicitly stated accountabilities for VTE risk assessment and provision of prophylaxis in admitted patients (15% at baseline).

In 2008, the ACSQHC funded the NHMRC to adapt and extend the public hospital program into the private hospital sector in support of achieving national spread. The evaluation of this programme will be completed in December 2009.

Lessons learnt throughout the implementation of this programme were published by the NHMRC in collaboration with the NHMRC's VTE Prevention Advisory Committee in an easy-to-use guide designed to help hospitals and health professionals improve practice in their local health service. The first edition of the guide *Stop the Clot: Integrating VTE prevention guideline recommendations into routine hospital care,* was released in 2007 with a second edition adapted and released for use in the private hospital program in 2008.[3,4]

The guide sets out in a step-by-step fashion the key issues that hospital managers and clinical leaders need to systematically integrate best practice VTE risk assessment and preventative measures into everyday hospital practice. Implementation resources that were developed and tested during the program have been included in the guide and are available at www.nhmrc.gov.au/nics. Resources include locally adapted whole-of-hospital policies for the prevention of VTE in acute adult inpatients, a VTE prophylaxis clinical audit and user guide, a VTE risk assessment and management form, guidance on project planning and awareness raising information for patients.

Changing practice requires multiple strategies at different levels within the healthcare system and tailored implementation resources and support for local health services in order to align healthcare funding, performance measures and systems of care with best practice and deliver better outcomes for patients.

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1. *Evidence-Practice Gaps Report, Volume 1*. Melbourne: National Institute of Clinical Studies, 2003. Available at www.nhmrc.gov.au/nics
2. *Interventions to increase the uptake of venous thromboembolism prophylaxis in hospitals*. Prepared by Australian Safety and Efficacy Register of New Interventional Procedures – Surgical (ASERNIP-S). Melbourne: National Institute of Clinical Studies, 2003. Available at www.nhmrc.gov.au/nics
3. *National Institute of Clinical Studies. Stop the Clot: Integrating VTE Prevention Guideline Recommendations into Routine Hospital Care.* Canberra: National Health and Medical Research Council, 2007. Available at www.nhmrc.gov.au/nics
4. *National Institute of Clinical Studies. Stop the Clot: Integrating VTE Prevention Guideline Recommendations into Routine Hospital Care.* Canberra: National Health and Medical Research Council, 2008. Available at www.nhmrc.gov.au/nics

In 2007 there were 16,670 deaths in England and Wales where venous thromboembolism (VTE) was mentioned on the death certificate.

Karen Dunnell, National Statistician, April 2009

Known barriers	Key element	Suggested strategy
Lack of awareness	Demonstrate importance/relevance of VTE prophylaxis in your hospital	Conduct local audits and provide unit-specific feedback to clinicians and heads of units
Knowledge and education deficits Disputed, inconsistent or inconclusive evidence	Improve clinician knowledge of VTE risk assessment and appropriate prophylaxis by risk category	Provide and discuss evidence in literature and guidelines to support prophylaxis Develop a hospital thromboprophylaxis policy that references the evidence Provide risk assessment and prophylaxis management summaries and easy-to-access guides Include information on policy, evidence and resources in hospital orientation and existing meetings, such as Grand Rounds, in-services
Lack of system support	Remind clinicians to assess patients for VTE risk	Include reminders in medication charts, care plans, clinical assessments, clinical pathways or other patient record documentation Integrate reminders into electronic patient management or reporting systems Consider building preliminary risk assessment into pre-admission/admission processes or integrated into other risk assessments Use risk assessment forms to assess and document risk Consider adding VTE prophylaxis measures into patient medication chart
	Assist clinicians to prescribe prophylaxis appropriately	Have risk assessment and management summaries/resources and prescribing guidelines easily available for clinicians
	Assess effectiveness of interventions and continue to review and refine your interventions	Conduct regular small-scale audits and surveys. Use the results to identify and overcome issues that are preventing best practice

Table 1
Barriers to VTE prevention and strategies to improve VTE prevention in hospital settings.[4]

Fig 1
Stop the Clot: Integrating VTE Prevention Guideline Recommendations into Routine Hospital Care.

BIOGRAPHY

Dr Susan Phillips joined the National Health and Medical Research Council's National Institute of Clinical Studies in July 2001 where she has led several national implementation programmes in primary, secondary and tertiary care settings in clinical priority areas including heart failure management and venous thromboembolism prevention. In her current role she leads the work of the institute in improving health care by translating the best available evidence from health and medical research into everyday clinical practice.

Susan has a background in medical research and extensive experience in health policy and implementation in the Australian Government and non-government sector. She obtained a Bachelor of Science (Hons) from the University of Sussex in 1981 and D Phil from the University of Oxford in 1985.

VTE prevention – the North American view

Professor Samuel Z. Goldhaber, Professor of Medicine, Harvard Medical School
and Dr Gregory Piazza, Clinical Instructor in Medicine, Harvard Medical School

The secret to venous thromboembolism (VTE) prevention in North America is that there is no unique viewpoint that pervades our continent.

North American healthcare professionals take pride in their independence, free-thinking and individuality. Thus, the traditional approach in North America has been to find champions of VTE prevention at each specific acute care hospital. They, in turn, convince their colleagues that VTE prophylaxis is proven to be beneficial and should be implemented routinely. This mode of action fits the philosophy of the famous Speaker of the US House of Representatives, Thomas "Tip" O'Neill, who once declared: "All politics is local". However, this paradigm has changed, because public policy has forced a new perspective.

There has been a groundswell of opinion from multiple coalitions of patients, providers and policy makers that the gap between our knowledge of how to prevent VTE and our implementation of prophylactic measures is wide and no longer acceptable. Steven K Galson, MD, MPH issued The Surgeon General's Call to Action to Prevent Deep Vein Thrombosis and Pulmonary Embolism on September 15, 2008, at the Venous Disease Coalition's Second Annual Meeting in Washington, DC. The 49-page report can be downloaded at the Surgeon General's website.[1] Galson estimates that between 350,000 and 600,000 Americans each year suffer acute VTE. He further estimates that in the USA alone, at least 100,000 deaths annually occur because of VTE. He states that although "we have made progress in our knowledge of how to prevent, diagnose and treat DVT [deep vein thrombosis]/PE [pulmonary embolism] … it is also clear that we are not applying that knowledge on a systematic basis …. To address that gap, we must disseminate information more widely about the availability of effective interventions to prevent and treat DVT/PE". Galson calls for continued investment in basic, clinical, translational and epidemiological research related to VTE.

Meanwhile, Medicare's most recent strategy to reduce medical errors is to withhold payment to hospitals for treatment of serious preventable illnesses or complications termed 'never events'. Medicare will not pay the incremental cost to manage a 'never event'. Rather, the hospital bears the additional financial burden.[2] As of October 1, 2008, Medicare declared the occurrence of VTE after total knee or hip replacement to be a 'never event'.

There are two fundamental approaches to improving prophylaxis among hospitalised patients at high risk. The first approach relies upon a hospital staff member alerting the physician that his or her high-risk patient is not receiving preventive measures. This technique can reduce symptomatic VTE by 20% over the ensuing 3 months after a 'human alert' issued to the responsible physician.[3] The second approach relies upon computer-based decision support and medical informatics systems to screen for high-risk patients, check whether they are receiving prophylaxis and warn the responsible physician with an electronic, computerised alert if preventive measures have not been ordered. This latter approach appears more effective, resulting in a more than 40% decrease in symptomatic VTE.[4] These two contrasting studies provide evidence that enables the Obama Administration to push hospitals and healthcare professionals to embrace computer technology as a means of improving the quality of health care. The fiercely independent practitioner, free to accept or reject VTE prophylaxis without oversight, is a fading memory destined to become a footnote in the history of medicine.

REFERENCES

1 http://www.surgeongeneral.gov/topics/deepvein/calltoaction/call-to-action-on-dvt-2008.pdf

2 Centers for Medicare and Medicaid Services HHS. Medicare program: changes to the hospital inpatient prospective payment systems and fiscal year 2009 rates; payments for graduate medical education in certain emergency situations; changes to disclosure of physician ownership in hospitals and physician self-referral rules; updates to the long-term care prospective payment system; updates to certain IPPS-excluded hospitals; and collection of information regarding financial relationships between hospitals. Final rules. *Fed Regist*. 2008; 73: 48433-9084

3 Piazza G, Rosenbaum E, Pendergast W, et al. Physician Alerts to Prevent Symptomatic Venous Thromboembolism in Hospitalized Patients. *Circulation* 2009; 119: 2196-201

4 Kucher N, Koo S, Quiroz R, et al. Electronic alerts to prevent venous thromboembolism among hospitalized patients. *N Engl J Med* 2005; 352: 969-77

> The probability of saving lives and reducing long-term complications for patients are, in themselves, sufficient reasons for NHS organisations to take these steps [preventing VTE]. But both providers and commissions could also see financial benefits if cases of VTE decrease – preventing VTE could improve productivity for providers, potentially shortening average lengths of stay whilst reducing future admissions and costs of ongoing care for commissioners.
>
> **NHS Confederation Briefing, May 2009**

Fig 1
The Surgeon General's Call to Action to Prevent Deep Vein Thrombosis and Pulmonary Embolism.

Fig 2
Effective prophylaxis is required to ensure that the occurrence of VTE after total knee or hip replacement is a 'never event'.

Fig 3
Deep vein thrombosis after bladder surgery in an elderly male (reprinted with permission from Prof Andrew Wylie, Department of Pathology, University of Cambridge).

BIOGRAPHY

Samuel Z. Goldhaber, Professor of Medicine at Harvard Medical School, is a Senior Staff Member of the Cardiovascular Medicine Division at Brigham and Women's Hospital (BWH). He is Director of the BWH Venous Thromboembolism Research Group and serves as Principal Investigator of a broad range of randomised clinical trials and observational studies related to the prevention, treatment, and epidemiology of venous thromboembolism.

In May 2006, he co-chaired the 2-day Surgeon General's Workshop on DVT, cosponsored by the National Heart Lung and Blood Institute (NHLBI). He is President of the nonprofit North American Thrombosis Forum (www.NATFonline.org). He also has a busy outpatient practice of both general cardiology and venous thromboembolism patients.

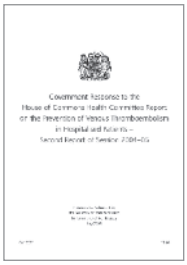
Dr Gregory Piazza is a Clinical Instructor in Medicine at Harvard Medical School. He received his Medical Degree from the University of Massachusetts Medical School in Worcester, Massachusetts, and completed medical residency at the Beth Israel Deaconess Medical Center in Boston, Massachusetts. He served as Chief Medical Resident for the Department of Medicine at Beth Israel Deaconess Medical Center.

Gregory completed training in Cardiology at the Beth Israel Deaconess Medical Center and is currently a Fellow in Vascular Medicine at BWH in Boston. He has been a member of the BWH Venous Thromboembolism Research Group for more than 10 years and has focused his research on the epidemiology and prevention of venous thromboembolism. He is the lead author of the multi-centre randomised controlled Physician Alert Trial on VTE prevention. This paper was published in *Circulation* in 2009.

Development timeline of the National Venous Thromboembolism Prevention Programme in England

February 2005

Health Select Committee Inquiry into the Prevention of VTE in Hospitalised Patients



July 2005

Government Response to the Health Select Committee Report

April 2007

CMO letter announcing the Report of the Independent Expert Working Group on VTE in Hospitalised Patients and a national approach to implement a systems-based strategy to reduce avoidable death from VTE in hospitals and the wider healthcare setting in England

2005 — 2007

July 2005

CMO letter announcing the establishment of Independent Expert Working Group

April 2007

Report of the Chief Medical Officer's Independent Expert Working Group on VTE in Hospitalised Patients

January 2009

WHO surgical checklist

June 2009

National NHS VTE leadership summit

June 2009

e-VTE website

September 2008

CMO letter announcing the publication of the National VTE Risk Assessment Template

November 2008

VTE Exemplar Centre and web resource site launch

2008 2009

April 2007

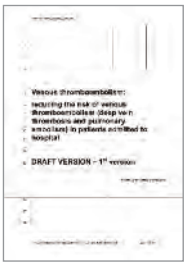
National Institute for Health and Clinical Excellence (NICE) Clinical Guidelines - Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery

September 2008

Department of Health National VTE Risk Assessment Template

November 2008

Publication of Map of Medicine VTE prevention pathway



Expected Nov 2009

NICE Clinical Guidelines - Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital

RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM (VTE)

Risk assessment is recommended for all patients on admission to hospital. It is recommended that all patients are periodically reassessed during inpatient stay as risk may change. Reassessment after at least 48 to 72 hours is recommended.

STEP ONE

Review the patient-related factors shown on the assessment sheet against thrombosis risk, ticking each box that applies (more than one box can be ticked). Use the highest category of risk if more than one box is ticked (e.g. if both moderate and high risk are ticked, use guidance for high-risk patients).

Any tick for thrombosis risk should prompt thromboprophylaxis according to local policy.

The risk factors identified are not exhaustive. Clinicians may consider additional risks in individual patients and offer thromboprophylaxis as appropriate.

STEP TWO

Review the patient-related factors shown against bleeding risk and tick each box that applies (more than one box can be ticked).

Any tick for bleeding risk should prompt clinical staff to consider if bleeding risk is sufficient to preclude pharmacological intervention.

STEP THREE

If the form has been filled out correctly and no boxes are ticked, then the patient is at low risk of venous thromboembolism and no intervention is indicated.

Guidance on thromboprophylaxis is available at:

- **surgical patients** – see *Venous Thromboembolism: Reducing the Risk in Surgical Inpatients.* National Institute for Health and Clinical Excellence. **http://www.nice.org.uk/nicemedia/pdf/VTEFullGuide.pdf**
- **medical patients** – see *Report of the independent expert working group on the prevention of venous thromboembolism in hospitalised patients.* Department of Health. **http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_073944**
- **obstetric patients** – the risk assessment is not intended for use in pregnant women. See *Thromboprophylaxis during Pregnancy, Labour and after Vaginal Delivery (37) January 2004.* Royal College of Obstetricians and Gynaecologists. **http://www.rcog.org.uk/index.asp?PageID=535**

This document has been authorised by the Department of Health
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RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM (VTE)

Thrombosis risk	Patient related	Procedure related	Tick
High	Age >60 years		
	Previous pulmonary embolism or deep vein thrombosis		
	Active cancer		
	Acute or chronic lung disease		
	Acute or chronic inflammatory disease		
	Chronic heart failure		
	Lower limb paralysis (excluding acute stroke)		
	Acute infectious disease, e.g. pneumonia		
	BMI >30kg/m^2		
		Hip or knee replacement	
		Hip fracture	
		Other major orthopaedic surgery	
Moderate		Surgical procedure lasting >30 minutes	
		Plaster cast immobilisation of lower limb	

Bleeding risk	Patient related	Procedure related	Tick
	Haemophilia or other known bleeding disorder		
	Known platelet count <100		
	Acute stroke in previous month (haemorrhagic or ischaemic)		
	Blood pressure >200 systolic or 120 diastolic		
	Severe liver disease (prothrombin time above normal or known varices)		
	Severe renal disease		
	Active bleeding		
	Major bleeding risk, existing anticoagulant therapy or antiplatelet therapy		
		Neurosurgery, spinal surgery or eye surgery	
		Other procedure with high bleeding risk	
		Lumbar puncture/spinal/epidural in previous 4 hours	

WHO Surgical Safety Check

(adapted for England and Wales)

SIGN IN (To be read out loud)

Before induction of anaesthesia

Has the patient confirmed his/her identity, site, procedure and consent?

☐ Yes

Is the surgical site marked?

☐ Yes/not applicable

Is the anaesthesia machine and medication check complete?

☐ Yes

Does the patient have a:

Known allergy?

☐ No

☐ Yes

Difficult airway/aspiration risk?

☐ No

☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

☐ No

☐ Yes, and adequate IV access/fluids planned

Name:

Signature of Registered Practitioner:

PATIENT DETAILS

Last name:

First name:

Date of birth:

NHS Number:*

Procedure:

*If the NHS Number is not immediately available, a temporary number should be used until it is.

TIME OUT (To be read out lo

Before start of surgical interventio
for example, skin incision

Have all team members introduced themselve

☐ Yes

Surgeon, Anaesthetist and Registered Pract verbally confirm:

☐ What is the patient's name?

☐ What procedure, site and position are p

Anticipated critical events

Surgeon:

☐ How much blood loss is anticipated?

☐ Are there any specific equipment requi or special investigations?

☐ Are there any critical or unexpected ste want the team to know about?

Anaesthetist:

☐ Are there any patient specific concerns?

☐ What is the patient's ASA grade?

☐ What monitoring equipment and other levels of support are required, for exam

Nurse/ODP:

☐ Has the sterility of the instrumentation (including indicator results)?

☐ Are there any equipment issues or conc

Has the surgical site infection (SSI) bundle

☐ Yes/not applicable

- Antibiotic prophylaxis within the last
- Patient warming
- Hair removal
- Glycaemic control

Has VTE prophylaxis been undertaken?

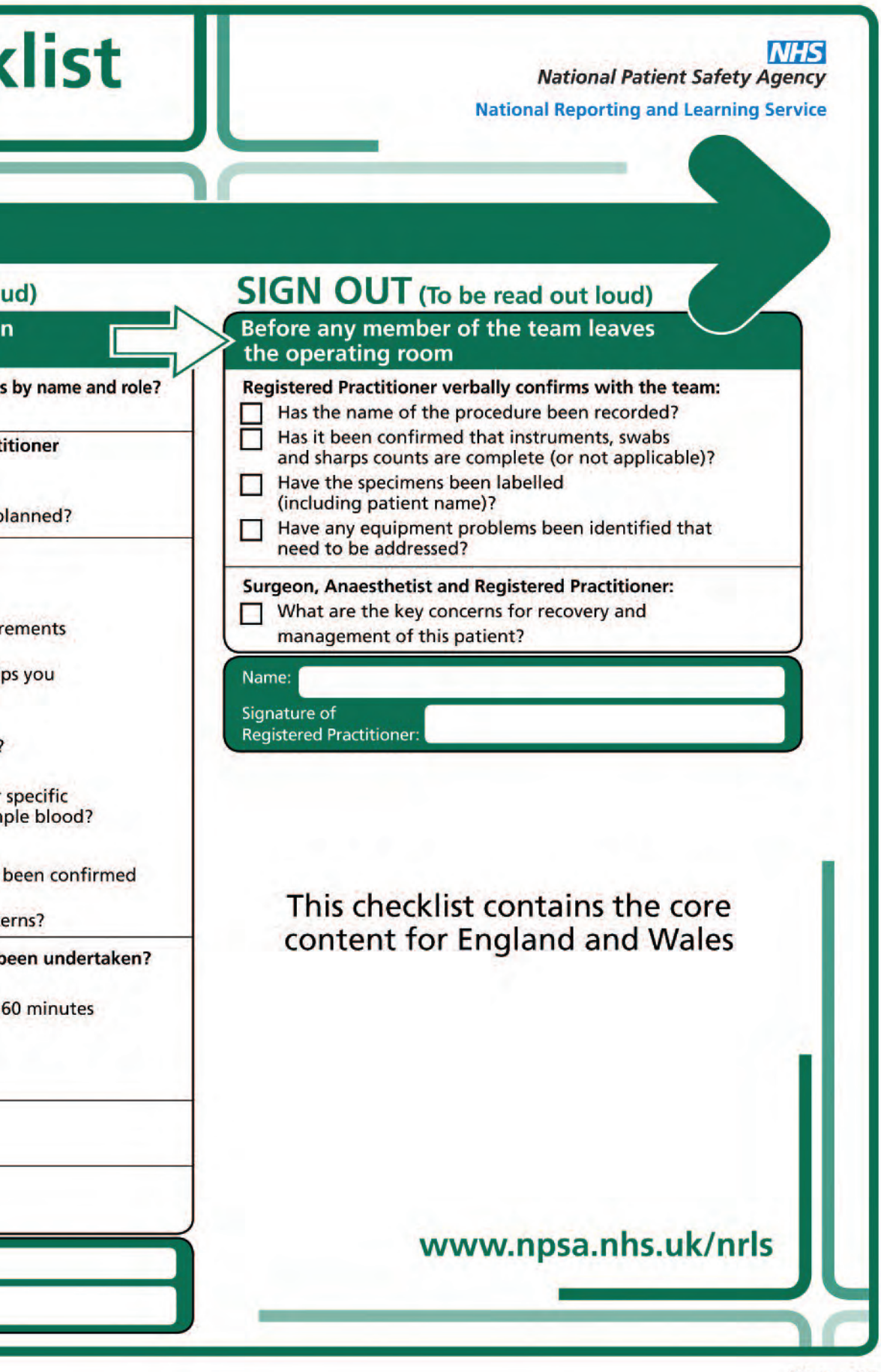
☐ Yes/not applicable

Is essential imaging displayed?

☐ Yes/not applicable

Name:

Signature of Registered Practitioner:



klist

NHS
National Patient Safety Agency
National Reporting and Learning Service

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been undertaken?
60 minutes

SIGN OUT (To be read out loud)

Before any member of the team leaves the operating room

Registered Practitioner verbally confirms with the team:

- ☐ Has the name of the procedure been recorded?
- ☐ Has it been confirmed that instruments, swabs and sharps counts are complete (or not applicable)?
- ☐ Have the specimens been labelled (including patient name)?
- ☐ Have any equipment problems been identified that need to be addressed?

Surgeon, Anaesthetist and Registered Practitioner:

- ☐ What are the key concerns for recovery and management of this patient?

Name:

Signature of Registered Practitioner:

This checklist contains the core content for England and Wales

www.npsa.nhs.uk/nrls

0861a January 2009

King's Thrombosis Centre

The King's Thrombosis Centre, led by Dr Roopen Arya, forms part of the Department of Haematological Medicine, an Academic Clinical Unit providing haematology laboratory and clinical services within King's College Hospital, London. The King's Thrombosis Centre was identified as the first NHS VTE Exemplar Centre as part of the Chief Medical Officer's initiative to promote best practice in the prevention of VTE.

VTE Exemplar Centres
Providing leadership in thrombosis care

VTE Exemplar centres form a diverse and enlightened network of hospitals that have an existing track record of excellence in VTE prevention and care, offer practical support and advice to other centres by sharing their resources, and collaborate on clinical research into VTE.

e-LfH
e-Learning for Healthcare

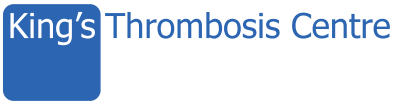
e-Learning for Healthcare is a Department of Health Programme working in partnership with the NHS and Professional Bodies to provide high quality e-learning content for the training of the healthcare workforce across the UK.

mapofmedicine®

The Map of Medicine is a web-based visual representation of over 300 evidence-based patient pathways based on clinical knowledge from the world's most authoritative sources. The Map provides a single resource across primary and secondary care settings and is licensed to all NHS staff in England and Wales. It is accessible to patients through the NHS Choices website.

For more information, please visit www.mapofmedicine.com

Project Editor: Aidan McManus PhD (MMRx Consulting)
Designer: Raz O'Connor (Map of Medicine)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