Venous Thromboembolism Prevention
A Guide for Delivering the CQUIN Goal
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Foreword

Professor Sir Bruce Keogh

I warmly welcome this guide that has been created in partnership between King’s Thrombosis Centre, VTE Exemplar Centres and Lifeblood. It is both timely, as we introduce a number of system changes designed to encourage and enable the NHS to save more lives from this terrible condition, and critical, in order to highlight the urgency of our collective healthcare response.

The National Venous Thromboembolism Prevention Programme in England

Venous thromboembolism (VTE) is a terrible condition which strikes rapidly and often silently to cause death or long term problems such as swollen limbs, varicose veins or festering limb ulcers. While there exists a range of estimates as to the burden of VTE, everyone agrees that it causes many thousands of deaths in hospitals in England each year. Many of these are avoidable, all cause untold heartache.

Last year at the National Conference on VTE Prevention, I was asked by two Royal Medical College presidents why, given that the problem had been known about for three decades, the Government would not mandate treatment to prevent VTE in our hospitals. I was struck by the sad irony that leaders of the medical profession were asking the Government to enforce good clinical practice. It seemed to me that the key to resolving this problem was to change professional and organisational attitudes. The first requires aggressive leadership from clinical Royal Colleges and the latter requires system wide carrots and sticks that acknowledge the devolved nature of the modern NHS and reinforces the importance of decisions being locally-owned and clinically driven.

So the SHA Medical Directors and I forged common cause between the Academy of Medical Royal Colleges, the Royal College of Nursing and the NHS leadership to make tackling VTE a top clinical priority for 2010. The deal was the DH would put levers in the system; the Royal Colleges would provide professional clinical leadership.

So, through the NHS leadership team, we have introduced a range of measures to prevent VTE in hospitals. These measures build on the former Chief Medical Officer’s work to raise awareness of this issue in the NHS since 2005.

We are now in an aggressive implementation phase, which started with the inclusion of VTE prevention in the NHS Operating Framework for 2010-11, which states explicitly that professional leadership in the area of VTE prevention will be provided by the Academy of Medical Royal Colleges. This represents a unique partnership between the Royal Colleges and NHS management in improving patient safety. The implementation phase for VTE prevention aims to ensure that all adult patients admitted to hospital are risk-assessed for VTE and, where appropriate, receive the right prevention (thromboprophylaxis).

To support this, the National Institute for Health and Clinical Excellence (NICE) published the new clinical guideline 92, ‘Venous
thromboembolism - reducing the risk’, in January 2010 and will be publishing a follow-up Quality Standard which will define good practice in this arena in June / July 2010. A national tool for risk assessment based on the NICE guidelines has been developed.

A financial incentive for organisations to focus on VTE prevention has been introduced through the Commissioning for Quality and Innovation Payment Framework (CQUIN) for 2010-11. A proportion of CQUIN payments to acute providers will be conditional on risk assessing at least 90% of patients admitted to hospital. From 1 June 2010, providers have been required to report the proportion of admitted patients who have been risk assessed. As well as ensuring uptake of risk assessment procedures, this will also support VTE prevention by providing a national picture so that further work can be targeted appropriately.

The commissioning arrangements for VTE prevention have been strengthened in the national contracting process for 2010/11. Acute service providers will be required to report to their lead commissioner through monthly audits of the percentage of patients receiving appropriate prophylaxis after risk assessment using the national tool. A root cause analysis of all confirmed cases of hospital-acquired VTE will also be required from every acute provider. This approach has proven to be of particular importance in reducing rates of MRSA.

The Academy of Medical Royal Colleges and Royal College of Nursing are supporting this work by producing speciality-specific guidance where needed, ensuring that their Fellows and Members are aware of the importance of VTE prevention and encouraging participation in audit of VTE prevention practice.

I have appointed Dr Anita Thomas OBE as National Clinical Lead on VTE, and she will report to me on progress of this implementation strategy.

To be successful this attack on VTE needs to be owned by everyone involved in the NHS, but driven by those who are experts in the field. This is why I am so pleased to see a guide such as this which represents the joint endeavour of enthusiastic Clinicians and experts in VTE.

Professor Sir Bruce Keogh has been NHS Medical Director since November 2007 and is responsible for the Clinical Policy and Strategy, Healthcare Quality and Medicines, Pharmacy and Industry Divisions within the Department of Health. He oversees the work of NICE, the National Patient Safety Agency and Medical Education England.
**Preface**

Dr Roopen Arya

Prevention of venous thromboembolism (VTE) has been identified as the most important safety practice in our hospitals. There is increasing awareness of the burden of disease due to VTE and most hospitals already have thrombosis committees and guidelines for thromboprophylaxis. This is the moment when systems, procedures and the culture within our hospitals must change to ensure delivery of the National VTE Prevention Programme in England. The measures that have been introduced, including the new national mandatory data collection of VTE risk assessment linked to a national CQUIN goal, the implementation of NICE guideline 92, and the recent publication of the NICE VTE quality standard, reflect the recognition of VTE prevention as a top clinical priority for the NHS by the National Quality Board, the NHS Management Board, and the Academy of Medical Royal Colleges. The National VTE Exemplar Centre Network continues to play a key role at this juncture by bridging national strategy and local implementation and disseminating best practice across the NHS.

The development of the National VTE Prevention Programme over the last five years was prompted initially by the recommendations of the Health Select Committee Report on the Prevention of VTE in Hospitalised Patients in 2005 and was made manifest by the recommendations of the Chief Medical Officer’s VTE expert group in April 2007, which sought to address the issue of reducing avoidable death, long-term disability and chronic ill health from VTE in hospitalised patients. The programme focuses on risk assessment, as this is the trigger for the VTE prevention pathway. Thinking about the risks of VTE and bleeding in each patient will increase thromboprophylaxis rates and improve outcomes by ensuring appropriate prophylaxis.

The implementation phase of the programme includes a new mandatory data collection, which began on 1 June 2010, to allow reporting and monitoring of VTE risk assessment nationally. This monthly census through UNIFY has financial and logistical implications for our Trusts. A national goal on VTE risk assessment was included within acute provider CQUIN schemes for 2010-11 to support the work on VTE prevention, linking payment to at least 90% of adult patients being risk-assessed for VTE on admission to hospital. Although most Trusts already have risk assessment procedures in place, the CQUIN goal requires that the risk assessment and exclusion criteria described in the National risk assessment tool are employed in full, with no exceptions or opt-outs agreed by the Department of Health to the policy of assessing VTE risk in all patients on admission. A ‘cohort approach’ to risk assessment using the National VTE risk assessment tool may be considered locally for certain patients. This approach allows Medical Directors (local and SHA) to make a clinical decision regarding a group of patients admitted for the same procedure who are felt to have a similar risk.
profile and are assessed as a group as being at no risk of VTE. Medical Directors are asked to take responsibility for compliance and SHA Medical Directors in quality assurance of this national approach. There are significant organisational challenges for Trusts to ensure that all patients within the denominator of the CQUIN goal are risk assessed, and logistical challenges to ensure that the risk assessment data are collected accurately.

Undoubtedly, this implementation phase is a major challenge for all of us in the year ahead. But I think this is one of the best opportunities that we have as clinicians to demonstrate our collective leadership and to help guide the NHS in a way that’s good for patients and help shape its future. With this in mind, King’s Thrombosis Centre, in conjunction with Lifeblood and then NHS London, arranged two workshops to facilitate exchange of ideas and sharing of resources to address the challenges around delivery of the CQUIN goal and other aspects of the National VTE Prevention Programme. This resource book hopes to capture many of the excellent suggestions made at the workshops and I wish to thank all the participants who gave openly of their time, materials, intellect and energy.

The content of this guide also leans heavily on the work being undertaken within the VTE Exemplar Centre Network. There are now sixteen VTE Exemplar Centres, spanning the length and breadth of the country and incorporating diverse models of healthcare within the NHS. These include acute hospital Trusts (from 200 to 2000 beds), North Lancashire Teaching PCT and the South West SHA forming an enlightened network of centres of excellence in VTE care. Under this ‘kite-mark’ for good practice in VTE care, Exemplar 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. We hope to have captured many of the innovative VTE prevention practices being developed within the Exemplar Centre Network in this guide. The Exemplar Centre website, hosted by the King’s Thrombosis Centre, provides easy access to these materials, with each Exemplar Centre equipped with a resource page for download of protocols and other materials.

We should feel justifiably proud of the National VTE Prevention Programme, which is identified by Professor Bill Goetz in this guide as perhaps the most comprehensive of any healthcare system in the world. There is now a unique opportunity for the NHS to move forward using a standardised VTE risk assessment tool, linked to NICE guidance on thromboprophylaxis and underpinned by a robust quality framework. It will be a considerable achievement when VTE prevention is fully integrated into NHS systems and will be hugely beneficial to our patients.

London, 14 June 2010
Director, King’s Thrombosis Centre Lead, National VTE Exemplar Centre Initiative London Director of Thrombosis
Introduction

Professor Beverley Hunt

Clinicians across England will rightfully support the Department of Health’s recognition that hospital-acquired venous thromboembolism (VTE) prevention be made a clinical priority for the NHS for 2010, by making it a national goal in the Commissioning for Quality and Innovation (CQUIN) payment scheme for hospitals. Incentivising hospitals to put evidence-based steps in place to ensure all patients are assessed for their risk of hospital-acquired clots will enable those at-risk patients to receive the life-saving preventative measures they need. At the same time, NICE has estimated this is highly cost-effective and will save NHS money by reducing the need to treat acute VTE and the long-term effects of those who survive their clot.

Anecdotal evidence suggests that VTE prevention is not being delivered effectively on the ground due to perceived difficulties in delivering the CQUIN goal. For this reason, Lifeblood and the VTE Exemplar Centre Network hosted a national workshop on 26th April 2010 at BMA House in London, inviting Chairs of Thrombosis Committees to feedback their experiences in attempting to deliver the CQUIN goal, and to share examples of how some of these difficulties have been overcome.

The workshop was oversubscribed. We were pushed to capacity with over 60 Trusts represented – and many more kept on the waiting list and requesting feedback following the event. The workshop made it resoundingly clear that Trusts up and down the country are facing similar practical barriers to implementing best practice. However, it was an extremely productive exercise, allowing us to listen to and learn from Trusts that have managed to come up with innovative and often simple methods of overcoming these barriers.

This Guide forms the output of that workshop. It brings together the key challenges and suggested solutions, which we hope will together enable those responsible for overseeing or implementing VTE prevention on the wards, to deliver the CQUIN goal. We would like to thank everybody who attended the workshop and thus contributed to this Guide (see picture). We strongly believe that shared learning of best practice can ensure Trusts are able to meet the VTE CQUIN goal, and in so doing, deliver the real life saving intervention that VTE prevention so clearly provides.

On 8th June 2010, as this guide went to Press, the new Secretary of State for Health, Rt Hon Andrew Lansley MP, reiterated the new coalition-government’s desire to “involve patients more in the care they receive, to remove central targets and to create an NHS focussed on patient outcomes”. Such a focus on outcomes, specifically on the decision not to reimburse secondary care providers for patients readmitted within 30 days, has huge relevance for Trusts with sub-optimal systems for preventing VTE in their patients.
Whilst the majority of centralised targets may become yesterday’s news, the long-term priority of preventing hospital-acquired VTE will not. The requirement to perform mandatory VTE risk assessment and prescribe appropriate thromboprophylaxis will continue, as the Secretary of State’s assertion that ‘high levels of infection, VTE, emergency readmissions, falls, and pressure sores all lead to suffering and cost’, is undoubtedly correct. Ultimately good care is safe care and in these times of fiscal prudence, we are assured that the NHS will continue more than ever to eliminate unsafe care which costs more, in lives and in cash.

Therefore, efforts made to undertake effective clinical audit now, so as to achieve the CQUIN VTE target, will pay dividends in both the future prevention of VTE and for the future monitoring of each Trust’s reimbursement linked clinical outcomes.

Professor of Thrombosis & Haemostasis, 
King’s College, London

Consultant, Guy’s & St Thomas’ NHS Foundation Trust

Medical Director, Lifeblood: The Thrombosis Charity (Health charity of the year 2010).

Access the website at: www.thrombosis-charity.org.uk
Venous thromboembolism prevention in the quality framework

At this point, the NHS in England is in the unique position internationally of having a national risk assessment tool for venous thromboembolism (VTE) in hospitals together with comprehensive national clinical guidance for appropriate thromboprophylaxis. The inclusion of a goal on VTE prevention within all acute CQUIN schemes in 2010/11 helps commissioners to ensure that these national best practice resources on VTE are effectively used for the benefit of patients at local level. There is a strong feeling in the NHS that this is the key point to move forward on VTE prevention with respect to patient safety and quality of care.

The National VTE Prevention Programme in England is in place and is perhaps the most comprehensive of any healthcare system. The implementation phase began in early 2010 and aims to ensure that all adult patients admitted to hospital are risk-assessed for VTE and receive appropriate thromboprophylaxis. This progress has been made possible by the steadfast commitment of many partners and stakeholders, who have worked with the Chief Medical Officer and NHS Medical Director on this patient safety initiative. The Academy of Royal Colleges is providing professional leadership and the National Exemplar Network is helping to promote and deliver best practice. System levers such as the CQUIN goal are in place, NICE quality standards are in development and the NHS Litigation Authority are piloting a risk management standard on VTE in 2010/11 (criterion 4.11). VTE now lies at the centre of our quality framework.

The CQUIN framework, VTE goal and quality indicator for VTE prevention

High Quality Care for All included a commitment to make a proportion of providers’ income conditional on quality and innovation, through the Commissioning for Quality and Innovation (CQUIN) payment framework. The framework, launched in April 2009, aims to support the vision set out in High Quality Care for All of an NHS where quality is the organising principle and is part of the commissioner-provider discussion everywhere.

The Department of Health (DH) guidance on using the CQUIN payment framework was recently supplemented by an addendum, which outlines developments to the framework for 2010/11. In conjunction with the NHS Operating Framework for 2010/11 and the national standard contracts for acute, ambulance, community, mental health and learning disability services, these contracts require commissioners to make 1.5% of contract value available for providers to earn if they achieve locally agreed quality improvement and innovation goals. CQUIN payments are conditional on the provider achieving the CQUIN goals set out within the contract. For cash flow purposes, the default position in 2010/11 contracts is that 50% of the financial value of the scheme is paid to the provider in advance in monthly instalments, with reconciliation against performance at least at months 3, 6, and 9 as well as at year end.

CQUIN schemes for acute providers (all providers of NHS funded care delivering relevant acute services under the NHS Standard Contracts for acute hospitals or community services, including Foundation Trusts, NHS Trusts and independent sector providers) in 2010/11 must include two nationally defined goals, which relate to reducing the impact of VTE and improving responsiveness to personal needs of patients. These goals each have a specified indicator and in total are linked to around a fifth of the value of schemes (0.3% of provider income). Specifically, the VTE national goal for acute CQUIN schemes in 2010/11 is to ‘reduce avoidable death, disability and chronic ill health from VTE’. The quality indicator that will be measured to show achievement of the national goal is the percentage of all adult inpatients who have had a VTE risk assessment on admission to hospital, using the national risk assessment tool. CQUIN payment will be dependent on achieving at least 90% of admissions risk assessed.

The new mandated VTE risk assessment data collection (ROC/R/0276/FT6/000MAND) will be via UNIFY, and the first mandatory monthly return will report on patients admitted in June 2010 and must be submitted no later than 28 July 2010. Trusts may submit data before this time on a voluntary basis relating to admissions in April and May 2010 and a return must be submitted each month. The requirement was delayed from April 2010 in order to give providers time to develop or modify local systems to enable reporting via UNIFY. Detailed guidance on the data collection is available in draft form on the UNIFY system currently. It should be emphasised that the requirement is for a
UNIFY

UNIFY2 is the main online data collection portal used by the NHS to collect and share performance information, aggregate data and statutory returns.

Data collection form: The upload template for data collection will be made available through the Non-DCT collections area of UNIFY2. The ‘control panel’ will allow the user to specify which provider they are from, for which month they are reporting, and also notifies the user of any validation errors which must be accounted for before uploading to UNIFY2.

Submission: Data on VTE risk assessment should be uploaded onto UNIFY2 and signed off no later than 20 working days after the month end e.g. information relating to June 2010 must be submitted no later than 28 July 2010.

Sign off policy: Data collection can be signed off at provider level. Commissioners or Strategic Health Authorities (SHAs) are not required to sign off this collection.

Revisions policy: Revisions before the cut off date for submission of data will be allowed, and can be made as many times as necessary. These revisions can be submitted in the normal way through UNIFY2. As stated above, this cut off date will be 20 working days after the month end. Revisions after the cut off date can also be made, but these must be done in liaison with DH colleagues.

monthly census through UNIFY, rather than a snapshot audit and that all patients must undergo risk assessment.

NICE clinical guideline 92

NICE published its clinical guidance (clinical guideline 92) on reducing the risk of VTE for adults admitted to hospital as inpatients (including those admitted for day-case procedures) in January 2010. This guidance updates and replaces NICE’s previous guidance produced in April 2007 (clinical guideline 46). This comprehensive guidance offers specific care pathways for all patients and provides specific criteria for assessing the risks of both VTE and bleeding across the range of patient groups. The recommendations for reducing the risk of VTE include pharmacological and mechanical methods. The guideline recommends that risk of bleeding and VTE are reassessed within 24 hours of admission and whenever the clinical situation changes. Other recommendations include ensuring that the methods of VTE prophylaxis employed are suitable, that VTE prophylaxis is being used correctly and that hospitals should identify adverse events resulting from VTE prophylaxis.

The ‘NHS Standard Contract for Acute Services’ and VTE prevention

The national contracting process stipulates that providers are expected to ensure that patients receive appropriate prophylaxis for VTE based on national guidance according to their risk assessment, and also to carry out root cause analysis on all confirmed inpatient cases of VTE. More specifically, from April 2010 the contract requires Trusts to:

(1) Report to their lead commissioner on local audits of the percentage of patients risk-assessed for VTE who receive the appropriate prophylaxis, both the risk assessment and the prophylaxis being based on national guidance. (Where appropriate prophylaxis is used but is not based on national guidance, the reasons for this clinical decision will need to be fully documented.)

(2) Undertake and report to their lead commissioner on root cause analysis of all confirmed cases of hospital-acquired PE and DVT (including those arising from a current stay or new events arising where there is a history of admission to hospital within the last three months, but not including patients admitted to hospital with a confirmed VTE with no history of an admission to hospital within the last three months).

![DVT presenting as a swollen leg; hospital-acquired VTE can be asymptomatic, hence the term ‘silent killer’](image_url)

*Image courtesy of James Heilman, MD on Wikipedia.*
NICE quality standard

As a result of High Quality Care for All, NICE was tasked with developing independent standards clarifying what high quality care looks like in relation to the three dimensions of quality, namely clinical effectiveness, patient safety and patient experience. This work is a key part of making quality the organising principle of the NHS. NICE quality standards will act as a final distillation of clinical best practice, derived from the best available evidence from NICE guidance or other sources accredited by NHS Evidence to provide a set of specific concise quality statements and associated measures that act as markers of high quality, cost effective patient care across a pathway or clinical area; are derived from the best available evidence; and are produced collaboratively with the NHS and social care professionals, along with their partners and service users.

The primary purpose of NICE quality standards is to bring clarity to matters of quality by providing patients and the public, health and social care professionals, commissioners and service providers with definitions of high quality care and provide a clear description of what a high quality service would look like, enabling organisations to aspire and progress to improve quality and achieve excellence. They are intended to support benchmarking of current performance against evidence based measures of best practice and to identify priorities for improvement.

The scope of the quality standard for VTE prevention is the reduction in risk of VTE in adults admitted as hospital inpatients or formally admitted to a hospital bed for day-case procedures.

Pregnant women and women up to 6 weeks post partum are also specifically covered.

1. All patients, on admission, receive an assessment of VTE and bleeding risk using the clinical risk assessment criteria described in the national tool.
2. Patients/carers are offered verbal and written information on VTE prevention as part of the admission process.
3. Patients provided with anti-embolism stockings have them fitted and monitored in accordance with NICE guidance.
4. Patients are re-assessed within 24 hours of admission for risk of VTE and bleeding.
5. Patients assessed to be at risk of VTE are offered VTE prophylaxis in accordance with NICE guidance.
6. Patients/carers are offered verbal and written information on VTE prevention as part of the discharge process.
7. Patients are offered extended (post hospital) VTE prophylaxis in accordance with NICE guidance.

CQUIN and VTE prevention beyond 2011

CQUIN monies are non-recurrent to providers, as they are conditional upon quality improvement goals which are agreed annually. CQUIN payments are separate from tariff and non-tariff contract income. It is understood that the Government is currently working to include VTE risk assessment within the standard acute contract to ensure the legacy of the national VTE programme continues if the data collection goal is not renewed in 2011. This is in line with the DH’s 5 year strategy ‘NHS 2010–2015: from good to great. Preventative, people-centred, productive’, which made eliminating avoidable cases of VTE one of a number of safety challenges to be met over the next five years.

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**Fig. 2**

VTE prevention care pathway for all hospital admissions (NICE clinical guideline 92).

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**Fig. 3**

NICE clinical guideline 92 was published in January 2010. National CQUIN goal for VTE was specified in an addendum to original CQUIN policy guidance.
Patients who are at risk of VTE

Medical patients
- If mobility significantly reduced for > 3 days or
- If expected to have ongoing reduced mobility relative to normal state plus any VTE risk factor.

Surgical patients and patients with trauma
- If total anaesthetic + surgical time > 90 minutes or
- If surgery involves pelvis or lower limb and total anaesthetic + surgical time > 60 minutes or
- If acute surgical admission with inflammatory or intra-abdominal condition or
- If expected to have significant reduction in mobility or
- If any VTE risk factor present.

VTE risk factors1
- Active cancer or cancer treatment
- Age > 60 years
- Critical care admission
- Dehydration
- Known thrombophilias
- Obesity (BMI > 30 kg/m²)
- One or more significant medical comorbidities (for example: heart disease; metabolic, endocrine or respiratory pathologies; acute infectious diseases; inflammatory conditions)
- Personal history or first-degree relative with a history of VTE
- Use of HRT
- Use of oestrogen-containing contraceptive therapy
- Varicose veins with phlebitis

*For women who are pregnant or have given birth within the previous 6 weeks see page 23.

Patients who are at risk of bleeding

All patients who have any of the following.
- Active bleeding
- Acquired bleeding disorders (such as acute liver failure)
- Concurrent use of anticoagulants known to increase the risk of bleeding (such as warfarin with INR > 2)
- Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hours or expected within the next 12 hours
- Acute stroke
- Thrombocytopenia (platelets < 75 x 10⁹/l)
- Uncontrolled systolic hypertension (≥ 230/120 mmHg)
- Untreated inherited bleeding disorders (such as haemophilia or von Willebrand’s disease)

Fig 4
Assessing risks of VTE and bleeding (NICE clinical guideline 92).

General medical patients
Does risk of VTE outweigh risk of bleeding?

Yes
Is pharmacological VTE prophylaxis contraindicated?

Yes
Offer pharmacological VTE prophylaxis with any one of:
- fondaparinux
- LMWH
- UFH

No
Consider offering mechanical VTE prophylaxis with any one of:
- anti-embolism stockings (thigh or knee length)
- foot impulse devices
- intermittent pneumatic compression devices (thigh or knee length).

No
Has patient been admitted for stroke?

Yes
Reassess risks of bleeding and VTE within 24 hours of admission and whenever clinical situation changes.

No
See page 13.

Fig 5
Care pathway for general medical patients (NICE clinical guideline 92).
Essential first steps to achieve the CQUIN goal

Trusts must employ the correct denominator for the VTE CQUIN goal quality indicator, which is the total number of adult inpatients (hospital admission will be as defined by your PCT and will include day cases and transfers). For the numerator (number of adult inpatients risk assessed), a ‘cohort approach’ to certain risk assessment in some patient groups may be permissible; these must be agreed with the Trust Medical Director in advance. Any patient regarded as part of a cohort is deemed to have been risk assessed, not exempted from risk assessment. In order to achieve the CQUIN goal, Trust Chief Executives should engage with NHS commissioners and agree a local package of VTE prevention initiatives to support the national programme and review these in the context of an SHA-wide programme of work. Institutional support and prioritisation of VTE prevention are essential to ensure the necessary VTE metrics are delivered. Next steps to ensure delivery of the CQUIN goal include identifying a lead physician, forming a multidisciplinary team to lead the change and identifying what success will look like.

**Understand the denominator for the VTE CQUIN goal**

Commissioners and provider need to complete the template within the contract, including time periods on which performance is assessed, and ensure a clear understanding of the numerator and denominator and data collection arrangements and timings. Figure 6 (right) shows the aspect of the upload template that will require providers to enter the information specified – found on the tab ‘Frontsheet’. Aspects (i) and (ii) are entered by providers, but (iii) is automatically calculated from items (i) and (ii) and cannot be overwritten.

The DH has confirmed that the denominator specified for the CQUIN census is the number of adults admitted as inpatients. This specifically includes day cases (including regular day case attendees), maternity cases, and transfers, both elective and non-elective admissions. There are no exceptions in principle to the policy of all adult patients receiving a risk assessment for VTE on admission (ordinary and day cases). It is not the intention to replace an enthusiastic consensus on risk assessment, which is based on the perception that this something worth doing for the good of patients, with a bureaucracy that irritates and alienates health care professionals required to deliver the care. This data collection on VTE risk assessment is intended to embed VTE risk assessment across the NHS and will be critical in evaluating the impact of the National VTE Prevention Programme on improving health outcomes for patients.

<table>
<thead>
<tr>
<th>VTE Risk Assessments on Admission to Hospital</th>
<th>Month Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>The number of adult inpatients (ordinary admission and day care) admitted in the month who have been risk assessed for VTE using the National Tool on admission to hospital.</td>
</tr>
<tr>
<td>ii</td>
<td>Total number of adult inpatients (ordinary admission and day care) admitted in the month.</td>
</tr>
<tr>
<td>iii</td>
<td>Percentage of adult inpatients admitted in the month assessed for risk of VTE on admission.</td>
</tr>
</tbody>
</table>

Fig 6

Data collection form for Non DCT collection.
**Case study**

The East of England (EoE) SHA commissioning framework requires that contracts for services should ‘ensure that all patients (inpatient and day-case patients) receive evidence-based VTE risk assessment on admission and if their clinical status changes, that appropriate thromboprophylaxis is administered to reflect the risk profile from the risk assessment.’ EOE PCT operational plans have been scrutinised by the SHA to ensure that the key delivery components for VTE are included in sufficient detail i.e. services commissioned in line with new NICE guidance and subject to the national CQUIN goal.

### What constitutes a day case?

For the purposes of data collection on VTE risk assessment, the definition of an admission is subject to local admissions policies and local arrangements for admission criteria. The UNIFY collection covers all those patients who, under local definitions, have been admitted to hospital, either for a day case procedure or as an ordinary admission. This data collection is a census of all patients – it is not considered appropriate to use sampling methodologies to produce estimates.

The definition of a Day Case admission can be found within the description of the NHS Data Model and Dictionary attribute Patient Classification:

“A patient admitted electively during the course of a day with the intention of receiving care who does not require the use of a hospital bed overnight and who returns home as scheduled. If this original intention is not fulfilled and the patient stays overnight, such a patient should be counted as an ordinary admission."

For patients who make daily ward visits, such as those allowed to go home every night and attend the next day for the next course of treatment, for example chemotherapy, the activity is recorded as a series of admissions, with the Patient Classification recorded as National Code 03 Regular Day Admission, defined by the NHS Data Model and Dictionary as: “A patient admitted electively during the day, as part of a planned series of regular admissions for an on-going regime of broadly similar treatment and who is discharged the same day. If the intention is not fulfilled and one of these admissions should involve a stay of at least 24 hours, such an admission should be classified as an ordinary admission. The series of regular admissions ends when the patient no longer requires frequent admissions."

### Numerator of the CQUIN goal

The numerator of the CQUIN goal is the number of adult inpatients (ordinary admission and day care) admitted in the month who have been risk assessed for VTE using the National Tool on admission to hospital.

A ‘cohort approach’ to risk assessment using the National VTE risk assessment tool may be considered locally for certain patients undergoing procedures where that cohort of patients share similar characteristics and are not at risk of VTE according to the NICE guidance [11,12]. This approach to risk assessment can only be used when the Trust Medical Director is satisfied that, when using the National VTE risk assessment tool in conjunction with the NICE guidelines, the cohort would always be regarded as not at risk of VTE, or no pharmacological or mechanical prophylaxis would be appropriate regardless of the risk factors.

Any such local protocols must be agreed with the Trust or hospital Medical Director, and included within local VTE governance policy and audits. SHA Medical Directors will be involved in the assurance of this approach. Any patient regarded as part of a cohort is deemed to have been risk assessed, not exempted from risk assessment.

The Trust/hospital Medical Directors are responsible for signing off that the VTE risk assessment being used at a local level is fully compliant with the National VTE risk assessment tool and that all risk factors have been taken into account. SHA Medical Directors have provided guidance on which cases might be suitable for a cohort approach. Examples of day case procedure groups that have been assessed as being at low risk of VTE include haemodialysis and cataract surgery (specifically ophthalmological procedures with local anaesthetic/ regional/sedation and not full general anaesthetic).

### Pregnancy and VTE prevention

VTE is a major source of maternal mortality and morbidity in pregnancy and many of these events are potentially preventable through identification of risk and appropriate prophylaxis. The Royal College of Obstetricians and Gynaecologists has set a set of guidelines entitled Thrombosis and Embolism during Pregnancy and the Puerperium, Reducing the Risk (Green-top 37), which are widely employed in clinical practice. The NICE guideline includes pregnancy and the puerperium as risk factors and the Green-top guideline was considered during the NICE guideline development;
it is the intention that the Green-top guideline is consistent with the clinical practice recommendations included in the NICE guideline.

Recommendations for risk assessment of pregnant women as part of the CQUIN goal are not different; women admitted to hospital are to undergo a risk assessment and these figures to form part of the census.

Engage with your PCT/ Commissioners

In England, PCTs are the local NHS commissioners. They consult and work collaboratively with a variety of partners within and outside the NHS, but are ultimately accountable for commissioning decisions, the budget, and health, well-being and clinical outcomes. They have to be able to publish a credible account of effectiveness, efficiency and equity. It is incumbent upon commissioners to ensure that the services they commission assess all patients for risk of VTE using an assessment tool complying with the most recent NICE and DH guidance and that those services comply with NICE guidance on the prescription of VTE prophylaxis and in the near future with the NICE quality standard for VTE prevention.

The CQUIN framework remains a national framework for locally agreed schemes, and it is incumbent on commissioners and providers to discuss and agree how to translate these national goals into action at local level. Many Trusts, particularly those without an electronic risk assessment tool and reliant on paper, will find it difficult to put in place the necessary processes to ensure compliance with the 90% threshold for risk assessment by June 1st. Therefore, the recommendation is to begin a constructive engagement with commissioners immediately, focusing on the entire package of VTE prevention initiatives being undertaken within the Trust.

Effective engagement by PCTs and Trusts is critical in agreeing the regional measures, which will include not just the goal of VTE risk assessment alone, but also the fulfilment of the NHS Standard Contract obligation to audit appropriate prophylaxis and undertake root cause analysis of all cases of hospital-acquired VTE. For many Trusts, agreement has already been made with local commissioners to deliver the package of VTE prevention initiatives in a slightly extended timetable, looking at complete compliance by Q3 or Q4 of 2010. Clearly, identifying cases of hospital-acquired VTE, performing root-cause analysis, and feeding back the results into the clinical risk management framework of Trusts will require significant culture change. Introducing the risk assessment goal is a trigger for this, and is at the top of this pathway; but gradually, over the next few months, layering additional interventions such as thromboprophylaxis audit and in-hospital VTE education will be required to make this whole programme of VTE prevention a success.

An SHA-wide programme of work

Determine how Trusts in your local SHA are interacting and assess the value of developing an SHA-wide programme for VTE prevention. Integrating local efforts into a single SHA-wide vision for VTE prevention and the identification of a common vision helps resource sharing, aids operational implementation and sharing of best practice.

Institutional support and prioritisation of VTE prevention

In March, the Chief Medical Officer and the NHS Medical Director issued a ‘Dear Colleague’ letter to ask that the Chief Executives of all acute providers (who have not already done so) ensure the introduction of procedures to support the forthcoming mandatory data collection relating to VTE risk assessment by 1 June 2010, and for all Medical Directors to ensure that time that any risk assessment templates used locally have the same clinical risk assessment criteria as are summarised in the revised National VTE risk assessment tool. Although the communications in March and April from the Chief Medical Officer, the NHS Medical Director and the Academy of Medical Royal Colleges will have ensured that all Trusts are aware of the requirements of the National VTE Prevention Programme, many will still be developing programmes to address achieving these VTE prevention improvements. Institutional support and prioritisation for the initiative, expressed in terms of policy, a meaningful investment in time, equipment, personnel, and informatics, and a sharing of institutional improvement experience and resources to support any project needs, are vital to ensure success. Simple steps of updating Trust policy to reflect the VTE goal, for example by forbidding prescribing until a VTE risk assessment has been documented, offer credence and priority to VTE prevention.

Identify a lead physician, form a multidisciplinary team and develop an action plan

Awareness of VTE prevention has never been higher and all medical staff will have been contacted by their Royal College regarding the National VTE Prevention Programme. Engaging senior Trust staff, including medical directors and consultants and then nominating clinical area leads to take responsibility for VTE prevention is essential.

Identifying an appropriate clinical lead with management responsibility is valuable. Most hospitals will have in place a multi-disciplinary thrombosis committee that can drive the process and ensure

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**Case study**

At Chelsea and Westminster Hospital NHS Foundation Trust, the senior management supported VTE prevention by seeking the support of the Executive Clinical Governance Committee and specifying the reduction of hospital-acquired pulmonary embolism as a quality indicator in the Trust.

At King’s College Hospital NHS Foundation Trust, VTE metrics will be incorporated as ‘key performance indicators’ in the Trust Clinical Scorecard. Senior management supports the integration of VTE risk assessment as a mandatory field for electronic clerking.
Royal College instructions to all members

In April, the Academy of Medical Royal Colleges instructed all Colleges and Faculties with Fellows and Members involved in direct patient care to:

1. Bring to the attention of all their Fellows and Members the importance of risk assessment and appropriate prophylaxis for venous thromboembolism in all patients admitted to hospital. This includes the assessment of risk in primary care at the time of referral to hospital.

2. Emphasise that all Fellows and Members should ensure that their clinical unit has systems in place to ensure all patients are assessed for VTE prophylaxis and that the reasons for the resulting decision are documented and appropriate therapy given. This may be achieved through modifying drug charts, for example.

3. Ensure Fellows and Members participate in regular audit of the percentage of patients risk-assessed for VTE. In some specialties this is suitable for becoming a mandatory standard for revalidation.

4. Produce specialty-specific guidance where needed.

5. Continue emphasis on the importance of VTE in undergraduate and postgraduate curricula and training programmes, and promotion through various e-learning initiatives.

Identify what success will look like

It is important to identify in your Trust, and in your region or SHA, what success will look like. In a broad sense, it is essential to develop a systems-based approach to the prevention of VTE in hospitalised patients to ensure success. This requires a professional workforce aware of the VTE risk, system-driven risk assessment and prophylaxis provision and evaluation of outcome.

The National VTE risk assessment tool, linked to the NICE guidelines, and all these elements and the challenge is delivering this ideal protocol in our hospitals. Introducing this protocol, ensuring VTE risk assessment and delivering the National VTE Prevention Programme will require change in almost all Trusts. The following elements are essential in supporting the change required to achieve the VTE prevention goals:

- Prioritisation and support for VTE prevention by Trust management
- Introduction of protocols that standardise VTE risk assessment and prophylaxis provision
- Embedding VTE prevention protocols into patient care
- Ensuring reliable data collection and performance tracking
- Ensuring educational programmes are created to support the protocols

The Federal Agency for Healthcare, Research and Quality in the United States looked at 79 different safety interventions including infection control, and identified VTE prevention to be the most effective.

Case study

The EoE VTE project is an SHA-wide initiative. The VTE project was initiated in 2009 under the ‘Towards the best, together’ vision and meeting the sixth pledge in Improving Lives; Saving Lives: “We will make our health service the safest in England.” The EoE VTE project is leading the way for the region to implement best practice and provide health professionals with the skills to implement these measures. The objectives of the project are:

- To reduce the incidence of hospital-acquired VTE in all EoE hospitals by 50%
- To develop systems, processes and audit for VTE prevention in secondary care
- To include VTE measures in the commissioning framework for all secondary care
- To develop and implement a process measure tracking mechanism and specimen contract schedule for inclusion in 2010/11 contracts
- To provide training and education to all health professionals on the prevention and treatment of VTE.

The EoE VTE project is shown in more detail on page 21 of this book.
Introduce protocols that standardise VTE risk assessment and prophylaxis provision

Modifying the National risk assessment tool to local needs and linking VTE risk assessment with NICE-compliant prophylaxis provision are common steps to ensure effective thromboprophylaxis delivery. In the long term the answer to the challenges of achieving documented risk assessment for all patients lies in an electronic system.

In September 2008, the Chief Medical Officer released the National VTE risk assessment template. Authored by the VTE Implementation Working Group in consultation with the main stakeholders in VTE, this was a useful evidence-based tool to raise awareness and guide the risk assessment process. With the publication of NICE clinical guideline 92 in January 2010\(^2\), the National tool was updated by DH in collaboration with NICE and importantly included a single tick option for mobile medical patients to complete the risk assessment. It is the information in this tool that sets out the criteria for VTE risk assessment that the DH expects all Trusts to employ as part of the mandatory data collection on risk assessment. The National VTE risk assessment tool is reproduced in full in the resource section of this book.

Local modifications of the risk assessment tool

It is expected that Trusts will modify their local risk assessment process to ensure this basic data set is incorporated into their local documentation and systems, either paper-based or electronic, and it is these elements that must be completed to ensure the CQUIN quality indicator is achieved. To ensure compliance with the NICE VTE quality standard, the document should include risk assessment on admission and re-assessment within 24 hours of admission for risk of VTE and bleeding. Many Trusts have created a unified risk assessment and prophylaxis provision tool, incorporating NICE-compliant thromboprophylaxis recommendations into a single document.

Paper-based risk assessment tools

The addition of patient identifiers, signature lines and additional columns to facilitate easy addition of locally-required information can tailor the risk assessment tool to local needs. Examples of modified paper-based risk assessment tools are provided in the resources section.

Electronic risk assessment

In the long term the answer to the challenges of achieving documented risk assessment for all patients lies in an electronic system. An example of the impact that an electronic risk assessment approach can have is shown below. The London Clinic, one of the National VTE Exemplar Centres, introduced an electronic system for risk assessment in Q2 2007; the risk assessment rates went from about 30% to around 90% within one year. The further advantage of electronic risk assessment is the enabling of simple audit of the patient numbers.

![Impact of electronic risk assessment on risk assessment rates at the London Clinic.](image)

A National electronic risk assessment tool

At the national level, the Clinical Safety Team at NHS Connecting for Health is continuing to work on the development of electronic solutions to VTE risk assessment for hospitalised patients\(^{15}\). Work to develop a prototype VTE risk assessment tool is ongoing. A prototype tool was piloted at three NHS secondary care locations. The pilot work is aimed at testing the utility of a VTE risk assessment checklist on mobile and hand-held digital equipment.

Last year, NHS Connecting for Health identified the long-term vision of a strategic end-to-end solution throughout the patient’s journey from primary care to secondary care\(^{15}\). From the moment a GP referral is sent via Choose and Book information on the patient’s VTE risk could be included and extracted by the hospital PAS. This might then populate the VTE risk template and encourage risk assessment on admission. Throughout a patient’s hospital stay, staff would be assisted by a combination of VTE guidance, decision support embedded in the PAS and electronic bed board display and alerts. Medication record, discharge summaries and VTE history could be automatically populated from VTE clinical information held in the patient record. Any assessments conducted during their inpatient treatment could be sent back to their GP. While this remains the goal, many Trusts are pressing ahead with local electronic solutions to ensure the CQUIN goal of 90% risk assessment is achieved.
Case study

Modifying the National VTE risk assessment tool

The National risk assessment tool was modified at King’s College Hospital to integrate the elements of risk assessment with patient identification details, clinician responsibility including signature, and a link from the VTE risk category to the local (NICE-compliant) guidelines for thromboprophylaxis. There is a general view that a separate risk assessment for obstetric patients is important. At King’s College Hospital, a unique risk assessment for obstetric patients is employed, incorporating essential elements of the DH risk assessment tool and the Green top guidelines (see resources section).

Completing risk assessment quickly in mobile medical admissions/short-stay obstetric cases

For medical patient admissions, only those judged to have a projected three days of immobility are at risk of VTE. A simple tick in the mobility box for a medical patient NOT expected to have significantly reduced mobility relative to normal state completes the risk assessment. Frequently, pregnant women are admitted for several hours only and would not be anticipated to be immobile for an extended period. It may be possible to agree a ‘cohort’ definition for risk assessment in such cases.

![Modified risk assessment tool at King's College Hospital](image)

Eliminate the need to retype the risk assessment tool

Converting the National risk assessment tool from PDF to Microsoft Word is simple. With Adobe® Reader software, you can convert a PDF document to a text file and then edit directly. This will help you repurpose the existing text and graphics for your local VTE risk assessment template.

![Hospitalised medical patients are at risk of VTE if expected to be immobile for 3 days or more](image)

Simply open the PDF, right-click on the document, select copy and paste into a word document. The DH VTE risk assessment tool is available for download as a word document at [http://www.kingsthrombosiscentre.org.uk](http://www.kingsthrombosiscentre.org.uk)
Embedding VTE prevention protocols into patient care

It is vital that VTE prevention protocols are properly integrated into the clinical workflow. Ideal VTE protocols that link the National risk assessment tool with NICE-compliant prophylaxis options and contraindications are the essential base for layered interventions, such as education and audit. If the VTE protocol relies on traditional methods, such as stickers in drug charts and stapling the risk assessment to the patient’s notes, it is likely that audit will show disappointing results. VTE prevention protocols are more likely to fail if key principles for effective quality improvement are not followed. Success requires quality improvement schemes beyond protocol integration; developing roles for clinical support personnel and building in system prompts and hard stops will help embed prevention strategies into routine patient care.

Develop a Trust-wide VTE prevention policy

First steps include forming a Trust-wide VTE prevention policy. There is great value in piloting such a policy, seeking multidisciplinary feedback and redrafting protocols to perfect the policy. The policy should be reviewed by all services and specialties. Ensure widespread agreement with the individual business units or directorates involved, e.g. emergency care, medicine, surgery.

VTE protocols are the base for layered interventions

It is vital that VTE prevention protocols are properly integrated into the clinical workflow and for most hospitals, this remains a significant challenge. Ideal VTE protocols that link the DH risk assessment tool with NICE-compliant prophylaxis options and contraindications are the essential base for layered interventions, such as education and audit.

Small steps are important—ensure VTE prophylaxis guidance is available and easily accessible to all healthcare professionals and present on all wards and that the guidance is incorporated into protocols and within patient group directions—but for most Trusts, this will not be sufficient to ensure delivery of the VTE metrics required. VTE prevention protocols are more likely to fail if key principles for effective quality improvement are not followed. These principles have been identified by The Agency for Healthcare Research and Quality (AHRQ) in the United States (see information box).

Designing reliability into the VTE protocol

Estimates of the proportion of patients likely to receive prophylaxis have been made in the United States, and a ‘hierarchy of reliability’ has been calculated based on the extent of hospitals’ actions to implement a VTE prevention protocol (see Figure 11). These findings are valuable and suggest that

<table>
<thead>
<tr>
<th>Level</th>
<th>Integration of VTE protocol</th>
<th>Predicted prophylaxis rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No VTE protocol</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>Decision support exists but not linked to prescribing or prompts exist within prescribing but no decision support at hand</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Protocol well-integrated into prescribing at point of care</td>
<td>65-85</td>
</tr>
<tr>
<td>4</td>
<td>Protocol enhanced by other quality improvement schemes and implementing high-reliability strategies</td>
<td>80-90</td>
</tr>
<tr>
<td>5</td>
<td>Oversights identified and addressed in real time</td>
<td>&gt;95</td>
</tr>
</tbody>
</table>

Adapted from The Agency for Healthcare Research and Quality: Preventing Hospital-Acquired Venous Thromboembolism; A Guide for Effective Quality Improvement. [Fig 11]

Hierarchy of reliability based on actions to embed VTE prevention protocols.
Key principles for effective quality improvement interventions

1. Keep it simple

The trade-off between detail and simplicity in VTE protocols and required actions should tend towards simplicity.

2. Make your objectives SMART (Specific, Measurable, Achievable, Realistic, and Timetabled)

These criteria may be used both to set and assess objectives and act as a checklist to assure quality.

3. Do not interrupt workflow

Ensure the VTE protocols are easy to use, discouraging free text and incorporating simple steps to allow prescribing e.g. signature boxes to approve prophylaxis. Incorporate the protocols into routine patient care.

4. Design reliability into the process

If the VTE protocol relies on traditional methods, such as stickers in drug charts and stapling the risk assessment to the patient’s notes, it is likely that audit will show disappointing results. It is accepted that these traditional methods of improving VTE protocol uptake and adherence are helpful, but will not produce the required levels of risk assessment and prophylaxis provision that are required to fulfil the requirements of the National VTE Prevention Programme. In order to improve reliability, adhering to the VTE protocol should be linked to at least one of the following:

- The default action (i.e., not doing the desired action requires opting out)
- Prompted by a reminder or a decision aide
- Standardised into a process (i.e., deviation from the protocol feels wrong)
- Scheduled to occur at known intervals
- Responsibilities for desired action are redundant

5. Pilot on a small scale

Embedding the protocol should be piloted by physicians, pharmacists and nurses, and revised accordingly.

6. Monitor use of the protocol

The VTE protocol must become part of the admission process for every patient admitted to the hospital. When audit shows that the protocol has not been followed, a detailed review should identify which types of admissions are by-passing the protocol and tailor the process to eliminate these omissions.

Adapted from The Agency for Healthcare Research and Quality: Preventing Hospital-Acquired Venous Thromboembolism; A Guide for Effective Quality Improvement.4

even for hospitals with VTE protocols well-integrated into prescribing at the point of care, the expectation is that the levels of appropriate prophylaxis will not exceed 85%. Only at level 4 (high-reliability mechanisms are in place to make it a rare event for a patient to enter the hospital without going through a VTE protocol, where any variations from the protocol or adverse effects while on the protocol are studied in depth, where the protocol and its integration are continually refined and its use is continually increased based on these events, using the collective intelligence, experience, and investigation of the institution) can the levels of appropriate prophylaxis required be delivered. Successful level 5 reliability, with appropriate prophylaxis rates of >95% found on audit, is only within reach of hospitals with electronic medication records.

Drug chart integration of VTE risk assessment and prophylaxis provision

Many Trusts are now incorporating VTE risk assessment and prophylaxis measures into their local hospital drug chart, using stickers or designing new charts with VTE parameters included. The idea that VTE prevention should form part of a standard hospital drug chart has been given credence by The Academy of Medical Royal Colleges, who have called for the introduction of a standard hospital drug chart to help Trusts meet the demands to prevent VTE. The Academy has suggested that the presence of VTE prophylaxis on every chart would be an important incentive to risk assessment and appropriate prophylactic drug provision.

Drug chart integration of the VTE protocol can be linked to a Trust’s VTE prevention policy, for example by forbidding any prescribing until VTE risk assessment has been completed.
Case studies

At the Whittington Hospital, a 5-hospital collaboration on a new drug chart has resulted in the addition of thromboprophylaxis risk stratification on the front page and the introduction of a prescribing section specifically for thromboprophylaxis on the 3rd page.

At the Homerton Hospital, pre-printed stickers with different doses of low-molecular-weight heparin and compression stockings are available as additions to the current drug chart. A new drug chart has been developed and will be deployed shortly with the different forms of VTE prophylaxis already pre-prescribed, with a signature only required to initiate treatment. There is ongoing development of electronic prescribing to help fulfil the VTE prevention goals.

Quality improvement schemes - clinical support staff

At the King’s Thrombosis Centre, nurses have been in the front line of the VTE prevention initiative. The major quality initiatives have been the development of a nursing care plan to ensure a systematic approach to VTE prevention and the development of clinical nurse specialists, a consultant nurse role and the creation of VTE Link Nurses, who have taken ownership of the process on the wards and are embedding VTE prevention into routine patient care.

The Coagulation Link Nurse role was established to work with the Thrombosis Team to promote evidence-based practice and embed VTE prevention protocols throughout the Trust. The role of the Link Nurse is to act as a resource in their clinical area and to liaise with the Thrombosis Team. The Link Nurse role is to improve the quality of care, education of staff and patients and improve communication between the ward and the service. Each Link Nurse is provided with a badge to identify them to their team and patients. The nurse agrees to take on the responsibilities of the role, which are defined as:

- To liaise between their clinical area and the specified team
- To liaise with the nurse in charge of the clinical area with regard to the implementation of team policies and procedures
- To participate in teaching staff appropriate aspects of care relating to the specified area
- To act as a visible resource for both staff and patients
- To commit to attend Link Nurse meetings monthly and undertake any education required

System prompts and ‘hard stops’ for VTE prevention

Electronic patient record systems allow for simple reminder boxes to appear to influence physician behaviour, to allow oversights to be identified and addressed in real time. These allow the introduction of hard stops, blocking prescribing until the VTE risk assessment has been recorded, and in cases of patients at risk, using electronic prompts to consider prescribing of prophylaxis and to block further prescribing until the prophylaxis question is addressed.

Linking VTE risk assessment to routine blood test requests is another route to improve integration. For example, doctors can be prompted to complete the VTE risk assessment on admission and 24 hours after admission and the completion of risk assessment linked with requests for routine bloods, to ensure that the VTE risk assessment is completed on time.

Commissioning for VTE prevention

The CQUIN goal and the provider contracts for 2010 present profound opportunities to improve quality and patient safety by embodying the key issues and standards with respect to VTE prevention in a formally agreed and
documented national prevention programme. All Trusts must now report to their lead commissioner on local audits of the percentage of patients risk-assessed for VTE who receive the appropriate prophylaxis, and undertake root cause analysis of all confirmed cases of hospital-acquired PE and DVT (including those arising from a current stay or new events arising where there is a history of admission to hospital within the last three months). In this context, commissioning for VTE prevention requires a whole-system approach. EoE NHS has developed an SHA-wide VTE view, with world class commissioning and stakeholder engagement key components of the vision. The project was initiated in 2009 under the ‘Towards the best, together’ vision and meeting the sixth pledge in Improving Lives; Saving Lives: “We will make our health service the safest in England.” The project is leading the way for the region to implement best practice and provide health professionals with the skills to implement these measures.

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 to ensure all Trusts move to at least level 4 integration of VTE protocols into patient care.

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Fig 15
Mind map issues to consider when commissioning for VTE prevention.

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Fig 16
The East of England NHS has developed a VTE package to work towards.

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National Data
Local information

Needs Assessment

Project Management

Governance

Quality Improvement

R&D

Marketing

Audit
Trajectories

Root Cause Analyses
Medicines Management

Stand alone
Link to other initiatives

Evaluation of initiatives
New opportunities

Clinicians
Patients
Carers
Citizens
NHS Boards

Information

Commissioning

Education

VTE

PRMS
QoF
Referral Data
SUS
Hospital’s own
PROMs

Risk Assessment
Discharge arrangements
Follow up arrangements

Practice Based Commissioning
Map of Medicine

Clinicians
Patients
Carers
Trust Boards & Managers
Practice Based Commissioners

NPSA
BMA Learning

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Fig 17
Exemplar trusts

Existing Exemplars: Colchester Hospital, James Paget

Tertiary education engagement - VTE in undergraduate courses

Nurse Led-Doctor Complete system
Look Back Programme, Primary - Secondary care

Application of CQUIN to trusts, QIPP, Clinical Governance, CQC

World Class Commissioning, commissioning framework, NHS Operating framework 2010/11

Other health professionals e.g. pharmacists

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Exemplar
Trusts

Driving towards application for exemplar status

Future EoE Exemplar sites

University of Hertfordshire
VTE education courses

Regional best practice,
E-risk assessment tool,
Gateway system, drug charts

Trust reporting to SHA,
Audits, NICE Guidance

PCT-CQUIN,
Quality accounts

Networking events
for acute trusts, PCTS

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World Class Commissioning

Communications & Stakeholder Engagement

World Class Commissioning

Compliance/Quality/Clinical Governance (Operational - Performance Management)

Systems, Improvement, Best Practice

Education & Training

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World Class Commissioning

Communications & Stakeholder Engagement

Awareness campaigns - Stop the Clot campaign 2010, Stakeholder engagement events,
Third party/Charity engagement, Patient/carer involvement and experience
Ensuring reliable data collection and performance tracking

Ensuring reliable data collection is a key issue that must be addressed in every Trust. For CQUIN, the total hospital admissions will be available centrally in the Trust (denominator), but the challenge will be collating the numerator from many disparate sources. Electronic approaches, using electronic patient records or web-based databases can greatly simplify the process. Appropriate prophylaxis and root cause analysis audits are required now; in the near future, audits to fulfil the requirements of the NICE quality standard for VTE will be sought.

Collecting the numerator of the CQUIN goal

The general goal of VTE risk assessment for all patients has now been transformed into a metric-specific aim statement, with the process measure defined as 90% risk assessment of all in-patients. Simple audit is not sufficient to ensure this metric is delivered, as continuous census of the VTE goal is necessary to fulfil the CQUIN target. This represents a difficult challenge to Trusts – ensuring reliable data collection is a key issue that must be addressed in every Trust. While the total hospital admissions will be available centrally in the Trust (denominator), the challenge remains collating the patient risk assessment data (numerator) from many disparate sources.

Electronic records greatly simplify the process of establishing the numerator. In Trusts with electronic patient records, VTE risk assessment can be integrated into the record and the census conducted through retrospective data retrieval (see case study). In Trusts with website access on the ward, or using paper-based risk assessment, development of a web-based risk assessment tool greatly simplifies the data collection. Risk assessments can be conducted online, or completed on a hard copy template and entered online by data entry clerks later, with the website database allowing upload directly to UNIFY. Such a system is in development at Colchester Hospital.

For hospitals that operate electronic discharge systems, the addition of a tick box on the summary to indicate that VTE risk assessment has been completed may simplify the process of tracking risk assessment, and in addition offer an opportunity to work towards NICE compliance with regard to extended thromboprophylaxis. Making aspects of the discharge summary compulsory, such

Case study

Colchester Hospital University NHS Foundation Trust was designated as a National VTE Exemplar Centre in 2009. Among the measures taken by the Trust, one of the most exciting and innovative is the development of an online risk assessment tool to identify patients at risk of VTE, which also offers guidance on the steps that should be taken to minimise the risk and includes a database which will directly upload risk assessment data onto UNIFY. This new tool is being developed for the EoE SHA through their VTE Prevention Steering Committee. The new tool will be trialled from June and has the following functions:

- Risk assess for all inpatient scenarios compliant with the DH risk assessment tool
- Record the hospital and date of risk assessment
- Record bleeding risks, contraindications to pharmacological and mechanical VTE prophylaxis
- Calculate VTE risk of patient
- Recommend VTE prophylaxis for patient with care pathways for education
- Printout the risk assessment form with all details on one A4 page for attachment to drug chart for doctors’ signature, prescription, delivery of prophylaxis and audit
- Record on a central secure database for each Hospital/Trust each risk assessment on admission, at 24 hrs, and after 48hrs, and also anti-embolism stockings fitted and patient information leaflets provided to patients
- Production of monthly data for UNIFY

Fig 17
Web-based risk assessment and audit site developed by Colchester Hospital.
Case study

At Guy’s and St Thomas’ NHS Foundation Trust, five Electronic Patient Record (EPR)-based VTE risk assessment tools have been developed to facilitate documentation of patient-specific VTE risk assessment and retrospective retrieval for audit purposes. These are for medical, stroke, surgical, orthopaedic and obstetric patient groups. These EPR tools have been adapted from the National VTE risk assessment tool.

The VTE risk assessment tool includes a clinical summary of the Trust’s thromboprophylaxis guidelines and a mandatory field for documenting the outcome of the VTE risk assessment. The outcome of the VTE risk assessment includes whether mechanical or pharmacological thromboprophylaxis is indicated and prescribed and if so, which pharmacological agent / mechanical method of thromboprophylaxis is chosen.

The tools also record cases when thromboprophylaxis is not indicated at the time of the VTE risk assessment and the reason why. This includes patients on treatment doses of heparin/oral anticoagulant therapy at the time of the VTE risk assessment and for whom thromboprophylaxis is contra-indicated.

as the record of VTE risk assessment, and forcing completion of that section before discharge, will contribute to accurate measurement of the risk assessment metric. The addition of details of out-of-hospital thromboprophylaxis will support improvements in the transition of care to GPs.

VTE prophylaxis audit

Although data for the CQUIN indicator will be gathered via monthly UNIFY data collection, the evidence around appropriate prophylaxis and root cause analysis of VTE will be from clinical audit. Clinical audit of VTE prevention is now a compulsory aspect of the NHS standard contract and local audits of VTE prevention measures, in particular appropriate prophylaxis, are required. By early July 2010, the NICE quality standard for VTE will be published and this will introduce further audit requirements, including reassessment of risk after 24 hours and the provision of patient information on VTE prevention.

The NICE guidelines provide an audit template as part of the audit support tools for monitoring local practice, which can be accessed on the NICE website. NICE recommends using the whole tool or cutting and pasting the relevant parts into a local audit template. Data may be required from a range of sources, including policy documents and patient records. Suggestions for data sources are indicated on the tools, but most data should be available from patient records.

VTE prophylaxis performance dashboards

Performance tracking through dashboards is a commonly used management tool to gauge performance and progress toward agreed goals and are particularly suitable to inform Trusts of their performance on VTE prevention metrics. Using monthly reports, the highest performing units can be identified and praised, and those failing to achieve agreed goals identified clearly to the rest of the Trust. This can contribute to overcoming lack of awareness and apathy issues. Identifying those units not achieving the required goals allows a detailed analysis in those particular units of the reasons for the failing, such as a

Case studies

At the Whittington Hospital, continuous re-audit findings are published in the form of a performance dashboard. The audits have revealed problems amongst doctors and nurses regarding clear lines of responsibility regarding VTE prevention, and this has resulted in a plan to create work-flow diagrams to show where responsibility lies during a patient’s journey through the hospital.

At King’s College Hospital, audit objectives that were appropriate and would produce meaningful results were identified with the Trust Clinical Audit department. Junior doctors joined link nurses and the Thrombosis Team to conduct audits. Data collection sheets were designed and spreadsheets used to collate the data. Juniors accompanied more experienced auditors and places on the University of Hertfordshire Thromboprophylaxis course were secured for VTE Link Nurses to improve their audit skills. Relevant wards and clinicians were made aware that regular audits on VTE prevention metrics were being performed. The results were fed back to the relevant stakeholders and recorded on the Trust Clinical Scorecard.
lack of clarity regarding responsibility to risk assess, or unusual patient journeys through the hospital system resulting in opportunities to risk assess and prescribe prophylaxis being missed.

Balancing measures

An important consideration after major system changes is the monitoring of unintended consequences. It is important side-effects of the increase in prophylaxis provisions are also monitored and formally audited. This is especially the case for bleeding episodes. The Exemplar Centre Network has initiated a pilot study to monitor anticoagulant-related adverse events.

Root cause analysis of hospital-acquired VTE

Undertaking root cause analysis of every case of hospital-acquired VTE (patients who have had VTE relating to hospitalisation, including those whose clot was first discovered during the course of hospitalisation and in the three months subsequent to discharge) is a major challenge, which requires firstly capturing the cases, undertaking the analysis, notifying the stakeholders and feeding the learning back into the Trust quality management framework.

A local process should be developed to ensure that all cases of VTE that could potentially be regarded as hospital acquired are identified. It should be noted that in cases of recent hospitalisation in a different Trust, the root cause analysis should be conducted in the Trust in which the patient presents with VTE.

Clinical coding and VTE

The ICD-10 coding system is nationally and internationally recognised and plays an important role in hospital administrative data, but does not allow easy identification of VTE. The diagnosis codes that identify patients with VTE include: I26.0–I26.9, O88.2 for PE and I80.1–I80.9, I82.1, I82.8, I82.9, O22.3, O22.9, and O87.1 for DVT. In the United States, the AHRQ have launched quality measurement, quality improvement, and pay-for-performance initiatives that require identification of patients with acute VTE using a set of specific ICD-9-CM codes in hospital discharge records. In England, DH are exploring aggregation of existing ICD codes for VTE into three groups – acute VTE, chronic VTE and hospital-acquired VTE – to improve the utility of coding in the evaluation of the National VTE Prevention Programme.

Use of ICD-10 codes to track cases of VTE should be discussed and agreed beforehand within your Trust. It is important to realise that Trust clinical coders code for morbidity purposes. Mortality coding via death certificates is performed by the Office of National Statistics. Coding accuracy is critical to allow proper identification of VTE; three levels of coding must be followed:

1. Individual codes - each clinical statement of diagnosis must have the correct code assignment
2. Totality of codes - all codes necessary must be used to give an accurate clinical picture of the patient’s stay in hospital
3. Sequencing of codes - organised in a specific sequence which follows the rules and conventions of the classification

National benchmarking: estimates of hospital-acquired VTE

There are limited data on estimates of hospital-acquired VTE in England and Wales at present. Although it is widely accepted from post-mortem data that VTE causes many thousands of potentially preventable deaths, it is a challenge to more precisely define the overall burden of hospital-acquired VTE. In the United States, screening ICD codes for VTE in residents from the Worcester metropolitan area revealed that 36.8% of outpatients presenting with VTE had been hospitalised in the preceding 3 months, half for medical reasons and half to undergo surgery during the hospitalisation. These general numbers – somewhere between a third and a half of VTE events being linked to hospitalisation and medical reasons as important as surgical reasons – are widely accepted.

Systematic prevention of VTE is a key priority for the EoE Clinical Programme Board on Patient Safety. To calculate the potential for preventing VTE, an extract of Hospital Episode Statistics data for 2007–09 was analysed and the National VTE risk assessment model applied. This analysis showed 22,353 VTE admissions in the region each year, and 385,000 admissions of high-risk patients. On average, 5.8 (range: 4.2 to 7.8) per 1000 at-risk patients were diagnosed with VTE in hospital or within eight weeks following admission. This is in line with recent epidemiological studies, but varies considerably by hospital (see figure 20).

Using estimates that 40% of at-risk patients receive appropriate prophylaxis and that prophylaxis reduces VTE risk by 50%, VTE occurs in EoE at a rate of 7.25 per 1000 high risk patients not receiving prophylaxis, and at 3.63 per 1000 high risk patients receiving prophylaxis. Increasing prophylaxis rates to 80% would prevent up to 560 VTE events each year.

North Lancashire Teaching Primary Care Trust reviewed the same period 2007–09 and found 3185 patients admitted with a primary diagnosis of VTE. Of these, around half had stayed in the hospital in the previous 90 days. The VERITY registry reviewed 1919 patients with confirmed VTE and found that around a fifth did not seem to have an obvious risk for VTE. These figures suggest that in a large teaching Trust like Lancashire, there are...

Case study

The clinical symptom ‘Deep vein thrombosis in pregnancy’ would be coded as

Index entry:
  Thrombosis - pregnancy
  - deep-vein O22.3
O22.3 Deep phlebothrombosis in pregnancy
**Case study**

The King’s Thrombosis Centre team has developed an approach to the detection, review and reporting of hospital-acquired VTE. The team employs four VTE data acquisition points and staff at each of these points identifies patients to the Thrombosis team on a weekly basis.

**DVT outpatient and anticoagulation clinic**

The service reviews details of all new cases of VTE and screens for surgical and medical illness history (only VTE after 72 hours for medical admission) and more generally, a history of hospitalisation in the previous 90 days. These patients are flagged to the HAT assessment team.

**Discharge disease coding listings**

At King’s College Hospital, the Business Intelligence Unit provides details of patients with confirmed diagnosis of VTE from weekly discharge lists utilising ICD coding.

**DVT screening services**

Both the vascular laboratory and radiology department provide details of confirmed VTE cases on a weekly basis. These paper lists will shortly be replaced with electronic notification; a notification will be generated by the addition of a mandatory box for hospital admission in last 90 days, and admission date on the electronic request for vascular and radiology screening services.

**Autopsy findings**

The head of the mortuary provides weekly lists of patients with autopsy-confirmed VTE. The list also includes coroner’s cases.

Case notes from any patient identified from these data collection points are reviewed and a data collection form completed (see figure 19). Confirmed cases are presented at the weekly departmental thrombosis meeting. A notification letter is sent to the Consultant responsible for care, documenting the presence or absence of risk assessment and details of the thromboprophylaxis provided. All cases are further discussed as the monthly divisional meetings and feedback provided regarding each episode of hospital-acquired VTE.

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**Fig 19**
Hospital-acquired VTE data collection form used at King’s College Hospital.

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about 15 cases per week of hospital-acquired VTE, and that for about 3 cases, no obvious reason for the event will be identified. At King’s Thrombosis Centre, which serves an inner London population of around 700,000, around 5 cases per week undergo a root cause analysis.

There may be an opportunity to develop a national dataset to which we can all contribute and improve our understanding of hospital-acquired VTE.
Ensuring educational programmes are created to support the protocols

Multidisciplinary ward rounds, leadership walk-rounds, and grand rounds tied to education programmes backed by quality educational materials lie at the heart of ensuring the policies and practices to support VTE prevention are supported. Furthermore, engaging with patients and offering verbal and written information on VTE prevention, which itself is part of the NICE quality standard, is required to ensure VTE prevention is addressed on both sides of the doctor-patient relationship.

Ongoing professional training and education

All clinical staff should receive training on the Trust’s policy on VTE prevention; this should be mandatory, and monitored by the appropriate body in the Trust. A common complaint is the difficulty engaging with junior medical staff in the VTE dialogue. Introducing F1 and F2 teaching sessions on VTE and building VTE prevention into the induction process are valuable steps to consider. The e-VTE course developed by e-Learning for Healthcare through the DH will be extended to include a shorter induction-orientated module on VTE prevention and Trusts are considering making this a compulsory component of the induction training.

Many Trusts have created simple, colour-coded pocket guides on the prevention and treatment of VTE for easy reference for healthcare professionals, and are particularly suitable for junior doctors to use as referral guides. Internal communication channels should be utilised to ensure ongoing exchange of ideas and feedback.

Grand rounds

Grand rounds afford an ideal environment to provide an integrated review of the VTE prevention process, from evidence, Government policy through to local prevention policies. These events are particularly suitable to emphasise the changing environment of VTE prevention, including the introduction of the CQUIN goal, the NICE guidelines and the national approach to prevention.

Leadership walk-rounds

Another approach, successfully employed at Portsmouth Hospital and King’s College Hospital, is the use of weekly patient safety leadership walk-rounds; the presence of senior trust staff ensures that frontline staff are aware of their organisation’s commitment to VTE prevention and afford an excellent and informal method for leaders to exchange views with front-line staff about VTE issues in the organisation and show their support for staff-reported suggestions for improvement. Such events, linked to daily safety briefings on the ward, ensure the culture of VTE prevention becomes firmly embedded.
**Educational evenings and competitions**

Educational events directed towards the key Trust personnel driving VTE prevention such as nurses, junior doctors and pharmacists, are important to ensure a sense of camaraderie and team work. Asking the attendees to create and present materials, for example posters on VTE prevention and awarding prizes, ensures engagement and self-education.

**Engaging the patient**

Patient education about VTE forms a key part of the NICE VTE quality statements. These suggest that patients/carers are offered verbal and written information on VTE prevention at time of admission and discharge. Most centres have developed patient information leaflets and encourage the nursing staff to discreetly counsel patients found to be at risk of VTE, the recommendations for prevention measures and the signs and symptoms to watch for.

St George’s Healthcare NHS Trust will use a modified risk assessment tool that includes a patient information leaflet. The modified tool includes a signature section for prescribers indicating that risk assessment has been completed, allows multiple instances of risk assessment to be recorded and provides a patient information leaflet, which is perforated and can be detached to give to the patient.

Northwest London Hospitals NHS Trust is planning to adapt the ‘Lifeblood’ thrombosis charity’s patient information leaflet and to make this available on all wards, outpatient areas and pharmacy. The ‘Lifeblood’ patient information leaflet is available to download at: http://www.thrombosis-charity.org.uk/cms/images/stories/File/leaflets/Preventing_a_blood_clot_when_in_hospital.pdf

**Case study**

Colchester Hospital University NHS Foundation Trust was awarded “exemplar centre” status in 2009. E-learning for VTE is an integral part of the overall VTE prevention approach taken at the Trust.

Among the measures being taken by the Trust are:

- Development of a protocol in conjunction with its consultants and pharmacy staff in line with NICE guidance and the DH recommendations
- An e-learning tool for doctors and nurses who treat hospital inpatients
- Development of an online risk assessment tool to identify patients at risk of VTE and which also offers guidance on the steps that should be taken to minimise it
- The use of the Trust’s clinical audit department to evaluate and report back on the work to prevent VTE.

The ‘Nurse-Led-Doctors-Complete’ VTE risk assessment system was developed as part of a new programme set up to tackle the difficulties of achieving good compliance levels in VTE prophylaxis. It is part of a programme that includes new Trust-wide VTE protocols, eVTE learning, pre-printed drug chart stickers, online risk assessment, and audiocassette (rolling audiocassette with immediate educational feedback and emailed league tables for specialities and wards).

In today’s NHS, nurses are a constant presence on inpatient wards and unfortunately junior doctors are not. Hence the ‘Nurse-Led-Doctors-Complete’ VTE risk assessment system allows senior nurses to maintain compliance levels of VTE risk assessment and therefore prophylaxis. The nurses, once eVTE trained, notify junior doctors of missing risk assessments and ask them to complete the risk assessment form (online or on paper). The risk assessment forms are stapled to drug charts for ease of recognition and audit purposes. Once the risk assessment form has been completed, thromboprophylaxis can be given by nurses, and the patient is permitted to leave the ward for investigation or intervention.

Risk assessment and thromboprophylaxis is also checked on the pre-operative WHO checklist and surgery cannot proceed without them. If junior doctors are not available and a potential delay in patient care may arise, then senior eVTE-trained nurses can risk assess, but at present doctors must still check and sign the risk assessment forms. In the future, Colchester aims to allow DVT prevention nurses and ward nurse leads for patient safety to risk assess and prescribe.

Looking to the future, audits to fulfil the requirements of the NICE quality standard for VTE on patient information will be facilitated by the introduction of the new online risk assessment tool. This will record on a central secure database for each Hospital/Trust each risk assessment on admission, at 24 hrs, and after 48hrs, and also allow a record of the supply of patient information leaflets.
Prevention of venous thromboembolism: delivering this key patient safety priority

Both individual physicians and health care systems have responsibilities to provide thromboprophylaxis, the highest ranked patient safety intervention for hospitalised patients. The National VTE Prevention Programme in England delivers a framework that ensures the NHS now has an integrated approach with financial incentives to deliver this key patient safety priority.

I had the privilege of delivering the The Dr. Sol Sherry Memorial Lecture at the International Society on Thrombosis and Haemostasis conference in Boston in 2009. In that lecture, I extolled the virtues of high-quality clinical practice guidelines in the field of VTE prevention.

Guidelines are helpful because they summarise an extensive and sometimes complex literature and provide evidence-based recommendations that can be broadly applied. But I also pointed out that even excellent guidelines do not improve patient safety unless incorporated into clinical practice. At the national or system-wide level, a number of countries have created incentives or legislation to induce hospitals to implement patient safety practices related to VTE. At that point, England had both a national risk assessment tool and a national guideline, but audits continued to show poor implementation with low levels of risk assessment and inconsistent thromboprophylaxis provision. The next steps taken in England that are outlined in this book – a national mandatory data collection of VTE risk assessment linked to a specific national goal with financial penalties for failure, modification of hospitals’ contracts of acute care delivery to include prophylaxis audit, and a root cause analysis of any VTE event related to hospitalisation – transform the VTE prevention agenda and it is now more comprehensive than any such national initiative in the world.

It is only when VTE risk assessment and prophylaxis prescribing are incorporated into the culture of routine care that every hospitalised patient will receive thromboprophylaxis that is appropriate to their thromboembolic and bleeding risk. This resource book provides important insights into the local approaches that are being taken in English hospitals to deliver this most important of safety interventions for hospitalised patients.

BIOGRAPHY

Dr. William H. Geerts is Professor of Medicine at the University of Toronto in Canada. He is also Director of the Thromboembolism Program at Sunnybrook Health Sciences Centre in Toronto. His clinical practice is restricted to venous thromboembolism and his research interests involve the diagnosis, treatment, and prevention of thromboembolic disease, as well as guideline implementation and quality of care improvement.

For the past ten years, he has been chair of the Prevention of Venous Thromboembolism section of the ACCP Guidelines on Antithrombotic Therapy. He is currently the leader of the Safer Healthcare Now! initiative to improve the use of thromboprophylaxis across Canada. Dr. Geerts chairs the science committee for the Venous Disease Coalition.
Resource Centre
Development timeline of the National Venous Thromboembolism Prevention Programme in England

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

November 2008
VTE Exemplar Centre and web resource site launch

June 2009
National NHS VTE leadership summit

2008

For the development timeline from 2005-07 please refer to the VTE resource book, Venous Thromboembolism: A Patient Safety Priority

September 2008
Department of Health National VTE Risk Assessment Template

November 2008
Publication of Map of Medicine VTE prevention pathway

June 2009
e-VTE website
Jan 2010
NICE Clinical Guideline 92 – Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital

Jan 2010
NHS Operating Framework specifies VTE prevention as a national CQUIN goal

April 2010
NHS Standard Contract requires acute service providers to audit VTE prevention and undertake root cause analysis

April 2010
Academy of Medical Royal Colleges Statement on VTE

June 2010
A guide for delivering the CQUIN goal

June 2010
VTE Exemplar Centre Network increases to 16 centres

June 2010
Update of Map of Medicine VTE prevention pathway

March 2010
Updated National VTE risk assessment tool

June 2010
Mandatory risk assessment data collection linked to CQUIN goal begins

July 2010
NICE quality standard on VTE prevention published
National venous thromboembolism risk assessment tool

www.dh.gov.uk

RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM (VTE)

All patients should be risk assessed on admission to hospital. Patients should be reassessed within 24 hours of admission and whenever the clinical situation changes.

STEP ONE
Assess all patients admitted to hospital for level of mobility (tick one box). All surgical patients, and all medical patients with significantly reduced mobility, should be considered for further risk assessment.

STEP TWO
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).

Any tick for thrombosis risk should prompt thromboprophylaxis according to NICE guidance.

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

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

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

Guidance on thromboprophylaxis is available at:

http://www.nice.org.uk/guidance/CG92

This document has been authorised by the Department of Health
Gateway reference no: 10278
**RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM (VTE)**

<table>
<thead>
<tr>
<th>Mobility – all patients (tick one box)</th>
<th>Tick</th>
<th>Tick</th>
<th>Tick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical patient</td>
<td>Medical patient expected to have ongoing reduced mobility relative to normal state</td>
<td>Medical patient NOT expected to have significantly reduced mobility relative to normal state</td>
<td></td>
</tr>
<tr>
<td>Assess for thrombosis and bleeding risk below</td>
<td>Risk assessment now complete</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thrombosis risk**

<table>
<thead>
<tr>
<th>Patient related</th>
<th>Tick</th>
<th>Admission related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active cancer or cancer treatment</td>
<td></td>
<td>Significantly reduced mobility for 3 days or more</td>
</tr>
<tr>
<td>Age &gt; 60</td>
<td></td>
<td>Hip or knee replacement</td>
</tr>
<tr>
<td>Dehydration</td>
<td></td>
<td>Hip fracture</td>
</tr>
<tr>
<td>Known thrombophilias</td>
<td></td>
<td>Total anaesthetic + surgical time &gt; 90 minutes</td>
</tr>
<tr>
<td>Obesity (BMI &gt;30 kg/m²)</td>
<td></td>
<td>Surgery involving pelvis or lower limb with a total anaesthetic + surgical time &gt; 60 minutes</td>
</tr>
<tr>
<td>One or more significant medical comorbidities (eg heart disease; metabolic, endocrine or respiratory pathologies; acute infectious diseases; inflammatory conditions)</td>
<td></td>
<td>Acute surgical admission with inflammatory or intra-abdominal condition</td>
</tr>
<tr>
<td>Personal history or first-degree relative with a history of VTE</td>
<td></td>
<td>Critical care admission</td>
</tr>
<tr>
<td>Use of hormone replacement therapy</td>
<td></td>
<td>Surgery with significant reduction in mobility</td>
</tr>
<tr>
<td>Use of oestrogen-containing contraceptive therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicose veins with phlebitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy or &lt; 6 weeks post partum (see NICE guidance for specific risk factors)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Bleeding risk**

<table>
<thead>
<tr>
<th>Patient related</th>
<th>Tick</th>
<th>Admission related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding</td>
<td></td>
<td>Neurosurgery, spinal surgery or eye surgery</td>
</tr>
<tr>
<td>Acquired bleeding disorders (such as acute liver failure)</td>
<td></td>
<td>Other procedure with high bleeding risk</td>
</tr>
<tr>
<td>Concurrent use of anticoagulants known to increase the risk of bleeding (such as warfarin with INR &gt;2)</td>
<td></td>
<td>Lumbar puncture/epidural/spinal anaesthesia expected within the next 12 hours</td>
</tr>
<tr>
<td>Acute stroke</td>
<td></td>
<td>Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hours</td>
</tr>
<tr>
<td>Thrombocytopenia (platelets&lt; 75x10⁶/l)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncontrolled systolic hypertension (230/120 mmHg or higher)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Untreated inherited bleeding disorders (such as haemophilia and von Willebrand’s disease)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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301292 1p March 10
Modified national venous thromboembolism risk assessment tool

www.kingsthorbositycentre.org.uk

RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM (VTE)

All patients should be risk assessed on admission to hospital. Patients should be reassessed within 24 hours of admission and whenever the clinical situation changes.

STEP ONE
Assess all patients admitted to hospital for level of mobility (tick one box). All surgical patients, and all medical patients with significantly reduced mobility, should be considered for further risk assessment.

STEP TWO
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).

Any tick for thrombosis risk indicates HIGH risk of VTE, refer to King’s guideline for thromboprophylaxis.
If no box is ticked for thrombosis risk, the patient is at low risk of VTE.
The risk factors listed are not exhaustive; clinicians may consider additional risks in individual patients and offer thromboprophylaxis.

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

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

STEP FOUR
Date and sign risk assessment form and tick risk category
Prescribe thromboprophylaxis in accordance with King’s guideline for thromboprophylaxis following VTE risk assessment
Document VTE risk assessment completed on drug chart
Record VTE risk assessment complete on electronic Patient Status Board

Adapted from Department of Health, VTE risk assessment template, Department of Health: London, March 2010

King’s Thrombosis Team, April 2010
**Mobility – all patients**

<table>
<thead>
<tr>
<th>Task</th>
<th>Risk assessment now complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tick</td>
<td>Medical patient expected to have ongoing reduced mobility relative to normal state</td>
</tr>
<tr>
<td>Tick</td>
<td>Medical patient NOT expected to have significantly reduced mobility relative to normal state</td>
</tr>
</tbody>
</table>

**Assess for thrombosis and bleeding risk below**

<table>
<thead>
<tr>
<th>Task</th>
<th>Risk of VTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tick</td>
<td>High risk of VTE with low bleeding risk</td>
</tr>
<tr>
<td>Tick</td>
<td>High risk of VTE with significant bleeding risk</td>
</tr>
<tr>
<td>Tick</td>
<td>Low risk of VTE</td>
</tr>
</tbody>
</table>

**Neurological conditions**

<table>
<thead>
<tr>
<th>Risk of VTE</th>
<th>Recommended Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH (with low risk of bleeding)</td>
<td>Enoxaparin 40mg daily</td>
</tr>
<tr>
<td>HIGH (with significant risk of bleeding)</td>
<td>TED stockings +/- Sequential compression device</td>
</tr>
</tbody>
</table>

**Obstetric patients**

- Use rivaroxaban 10mg daily in elective lhr or knee arthroplasty post-operatively only.

**Neurological patients**

<table>
<thead>
<tr>
<th>Neurological condition</th>
<th>Risk of VTE</th>
<th>Recommended Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurosurgical procedure</td>
<td>Enoxaparin 40mg daily</td>
<td>TED stockings +/- Sequential compression device</td>
</tr>
<tr>
<td>Cranial surgery patients</td>
<td>Enoxaparin 40mg daily</td>
<td>TED stockings +/- Sequential compression device</td>
</tr>
<tr>
<td>Emergency spinal surgery</td>
<td>Enoxaparin 40mg daily</td>
<td>TED stockings +/- Sequential compression device</td>
</tr>
<tr>
<td>Head injury</td>
<td>Enoxaparin 40mg daily</td>
<td>TED stockings +/- Sequential compression device</td>
</tr>
</tbody>
</table>

**Factor V Leiden**

<table>
<thead>
<tr>
<th>Risk of VTE</th>
<th>Recommended Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>Enoxaparin 40mg daily</td>
</tr>
<tr>
<td>HIGH</td>
<td>Early mobilisation</td>
</tr>
<tr>
<td>HIGH</td>
<td>(Do NOT use TED stockings in stroke patients)</td>
</tr>
</tbody>
</table>

**Contraindications**

<table>
<thead>
<tr>
<th>Contraindications</th>
<th>Enoxaparin</th>
<th>TENS/SCDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor V Leiden</td>
<td>Enoxaparin</td>
<td>TENS/SCDs</td>
</tr>
<tr>
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</tr>
<tr>
<td>Factor V Leiden</td>
<td>Enoxaparin</td>
<td>TENS/SCDs</td>
</tr>
</tbody>
</table>

**VTE prophylaxis should be offered at admission**

**Timing**

Enoxaparin should start 6 hours post op (excluding haemostasis uneventful) and then at 6pm daily thereafter. In addition, Enoxaparin can be given the evening prior to surgery (excluding neurosurgery, see above). Mechanical VTE prophylaxis should be offered at admission.
VTE prevention at King’s College Hospital

King’s background in VTE prevention

King’s was the first NHS hospital named as an Exemplar Centre for VTE prevention and it hosts the national VTE Exemplar Centre website www.kingsthrombosiscentre.org.uk. As such, it has a key role in influencing the National VTE Prevention Programme in England and disseminating best practice in VTE prevention.

Who’s responsible for VTE prevention?

Staff at all levels are responsible for reducing the risk of VTE in hospitalised patients.

‘To be successful this attack on VTE needs to be owned by everyone involved in the NHS’

(Professor Sir Bruce Keogh, NHS Medical Director)

How VTE risk assessment works in practice at King’s

• On admission it is the responsibility of the doctor to ensure each patient is risk assessed for VTE. (Note: VTE risk assessment should be repeated within 24 hrs of admission and as the clinical condition of the patient changes)
• Once completed, this should be entered on the Electronic Patient Status Board (EPSB) by the nurse/pharmacist or administrator.
• The data will be collated by our Business Intelligent Unit who will forward it to the Department of Health and our Commissioners.

Examples of best practice at King’s

Part of the King’s strategy for implementing VTE risk assessment is to recognise the efforts of local VTE Champions and learn from their experiences. These will be people who demonstrate commitment, leadership and innovation in increasing concordance with VTE risk assessment in their clinical areas. You can find out who has been awarded the VTE Champion/s of the month by accessing Kwiki on Kingsweb (search VTE).
VTE Champions
As we are approaching September 2010, the June, July and August VTE Champions are included in this document.

June 2010 – VTE Champion – Lynda Dunsby
Sister Lynda Dunsby, on Waddington Ward was one of the first Coagulation Link Nurses to actively promote the use of EPSB within each ‘nursing handover’ to identify which patients still required VTE risk assessment. This demonstrated leadership as a role model amongst her peers and embraced change in adopting a new electronic system in order to enhance patient safety.

July 2010 – VTE Champion – Antony Jolly
Staff Nurse Antony Jolly (Coagulation Link Nurse) on Guthrie Ward, had an innovative idea to use a ‘stamp’ applied to a ‘post-it’ note on the drug chart, to draw the doctors attention to the VTE risk assessment form. This was a very effective idea, as supported by audit results. The idea is being adopted in other areas of the trust.

August 2010 – VTE Champions - Medical Assessment Unit (MAU)
The MAU team has demonstrated how multidisciplinary collaboration can improve concordance. Vanessa Sweeney (Clinical Manager) displayed strong leadership and belief in her team that VTE risk assessment would become embedded as part of the normal routine. Facing logistical barriers, her focus remained on finding solutions in developing a feasible strategy. Accompanying the doctors on their ward rounds, Heidi Mason, Sarah Jane Smith, Jo Watt and Jay Gammon, the Clinical Administrators (a role which is unique to Trauma, Emergency and Acute Medicine) reminded the doctors to complete VTE risk assessment if it had not been completed during the clerking procedure. The Ward Administrator then records this on EPSB by noon. The MAU transfer checklist now includes a section where the nurse can confirm that VTE risk assessment has been completed. Audit results show that this system is proving very effective.

September 2010 – VTE Champions – Surgical & Medical Critical Care Units
Jo Hunter (Senior Practice Development Nurse ICU) formed a Clinical Guideline Group for VTE which included several nurses from Surgical and Medical Critical Care Units, each focusing on a particular aspect of VTE prevention. This group worked with the Thrombosis Team to update local guidelines and incorporated regular audits to improve quality of care. VTE Link Nurses Liah Yaca and Sophie Steward amended the risk assessment tool to be more user friendly for ITU and led the implementation of VTE risk assessment locally whereby the nurses complete the forms. This tool was recently validated by the Thrombosis Committee and is now available via KWIKI.

Summary
These four examples are amongst many that are occurring every day in our trust, from which we can learn. The Coagulation Link Nurses/Midwives are doing tremendous work in each of their clinical areas and I would recommend you get to know who the VTE link is on your clinical area, as they can provide support and information on VTE.

The Thrombosis Team would like to thank everyone who took time to visit our stand and show their support. We can only maintain the excellent reputation of King’s as a VTE Exemplar Centre with each and everyone’s contribution to this major patient safety issue.

Where can I get more information?
- All the relevant documents can be accessed via the Kwiki page on Kingsweb, by searching ‘VTE’.
- Contact the Thrombosis Team on x3333.
- www.kingsthrombosiscentre.org.uk
The VTE Exemplar Centre Network

The Exemplar Centre Network forms a key component of the National VTE Prevention Programme. By bridging national strategy and local implementation, these demonstration sites provide leadership and promote best practice in VTE prevention.

Selected because of an existing track record of excellent VTE prevention and care, King’s College Hospital was named the first NHS Exemplar Centre in 2007 together with the London Clinic in the independent sector. Each year since, they have been joined by six further centres with a total of sixteen exemplar centres, spanning the length and breadth of the country and incorporating diverse models of healthcare. These include acute hospital Trusts (from 200 to 2000 beds), North Lancashire Teaching PCT and the South West SHA forming an enlightened network of centres of excellence in VTE care.

Under this ‘kite-mark’ for good practice in VTE care, the exemplar 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. The network’s study days and workshops on the practicalities of VTE prevention have proven popular. The Exemplar Centre website, hosted by the King’s Thrombosis Centre, was launched in late 2008 and provides an easy way for other sites to access exemplar materials.

Each of the 16 exemplar centres is equipped with a resource page allowing easy download of protocols and other materials. With many thousands of hits, this practical and informative open-access web resource has proven a great success in the drive to implement the National VTE Prevention Programme.
London’s Quality Observatory portal
http://lqo.csl.nhs.uk

London’s Quality Observatory (LQO) is a new web-based information portal supporting the NHS quality agenda for London. It will serve commissioners, clinicians and provider organisations, offering one-stop access to robust, high quality data and information.

The primary objective is to support the NHS in London implement Professor Lord Darzi’s Healthcare for London: A Framework for Action (July 2007), the implementation of which is being taken forward by the new Sector Acute Commissioning Units and PCTs, embedded in NHS London’s five-year Integrated Strategic Plan (ISP). The LQO will help facilitate the implementation of Healthcare for London through the provision of information that supports the achievement of quality in service provision, value for money and measurable improvements in commissioning.

The NHS London CQUIN meeting in May 2010 sought to address the issue of delivering the national CQUIN goal. The meeting was addressed by The NHS Medical Director, Professor Sir Bruce Keogh, who encouraged all delegates to work out the fine details around delivery of VTE prevention. Many ideas and working examples of VTE prevention initiatives that will help to deliver the CQUIN goal were brought to the meeting, and this information is being collated and placed on the London Quality Observatory, so that it’s available for all.

Fig 3
The LQO site includes slides and materials from the London CQUIN meeting (Venous thrombopoenolism: reducing the risk and improving care – delivering the national CQUIN goal), which took place on 10 May 2010.

Fig 4
The NHS Medical Director, Professor Sir Bruce Keogh, addressed the NHS London CQUIN meeting and encouraged all attendees to work out the fine details around delivery of VTE prevention. Pre and post meeting materials are available on the LQO site.
Map of Medicine and venous thromboembolism pathways

www.mapofmedicine.com/england

The VTE risk assessment pathway on the Map of Medicine has been updated in line with the latest clinical practice and reflects the 2010 NICE guideline and Department of Health guidance.

Why a Map of Medicine?

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?

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-acute 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.

Updates in 2010

The VTE risk assessment pathway now includes general recommendations for VTE risk assessment and bleeding assessment for all patients (including CQUIN government targets), and specific prophylaxis recommendations for surgical, medical, trauma, and pregnant patients. In line with Map of Medicine’s editorial methodology, the updated pathway includes information for patients and carers. The pathway also links to Department of Health’s VTE e-learning for healthcare, an online resource helping to raise awareness and understanding of VTE within the medical community.

Access the VTE Map of Medicine Pathway

The Map of Medicine is available license free to individuals across NHS England and Wales. You can access the pathway via www.mapofmedicine.com/england
e-Learning venous thromboembolism

www.e-vte.org.uk

e-Learning Venous Thromboembolism (e-VTE) is designed to raise awareness and improve understanding of VTE in the hospital setting and in primary care. It is available free to anyone with an interest in VTE prevention. It is currently updating the VTE course and creating a short course suitable for Trust induction training.

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.

About e-VTE

Developed by the Chief Medical Officer’s VTE Implementation Group in partnership with e-Learning for Healthcare (e-LfH), e-VTE supports the National VTE Prevention Programme. It helps clinicians take appropriate action when assessing the risk of VTE and discussing preventative measures. e-VTE consists of a pre-learning questionnaire and a post-learning assessment together with three e-learning sessions:

1. Demographics, epidemiology and risk of VTE
2. Methods of thromboprophylaxis
3. Implementation of thromboprophylaxis in hospitals

The content is written and reviewed by clinical experts, including Dr Roopen Arya. Each session is easy to use, taking no more than 20 minutes to complete. The e-learning uses imagery, video, audio, animation, case studies and interactive exercises.

Accessing e-VTE

e-VTE is available at www.e-vte.org.uk. Note that learning activity is not tracked and recorded via this site. To track and record your progress and completion of e-VTE, please follow the guidance below:

- NHS healthcare staff (excluding doctors): e-VTE is available on the National Learning Management System (NLMS) which is fully integrated with the Electronic Staff Record. Please contact your internal Trust Training and Development Lead about accessing e-VTE via the NLMS.
- Existing e-LfH users (doctors): e-VTE will be available in the following e-LfH e-learning projects: Anaesthetics, Emergency Medicine, Foundation, Primary Care and Radiology. If you are currently accessing another e-LfH e-learning project not listed here please contact support@e-lfh.org.uk.

Updating the course

e-Learning for Healthcare are currently working with the Department of Health to update the programme and creating a short course suitable for Trust induction training.
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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.

Lifeblood wishes to increase awareness of thrombosis among the public and health professionals and to raise research funds to improve patient care through improved prevention and treatment of venous thromboembolic disease.