ALL-PARTY PARLIAMENTARY THROMBOSIS GROUP
Awareness, Assessment, Management and Prevention

NHS INNOVATION SHOWCASE:
DVT DIAGNOSIS AND TREATMENT IN PRIMARY CARE

MARCH 2015

IMPROVING OUTCOMES, SAVING LIVES, SAVING MONEY: **INNOVATIVE DVT PATHWAYS**

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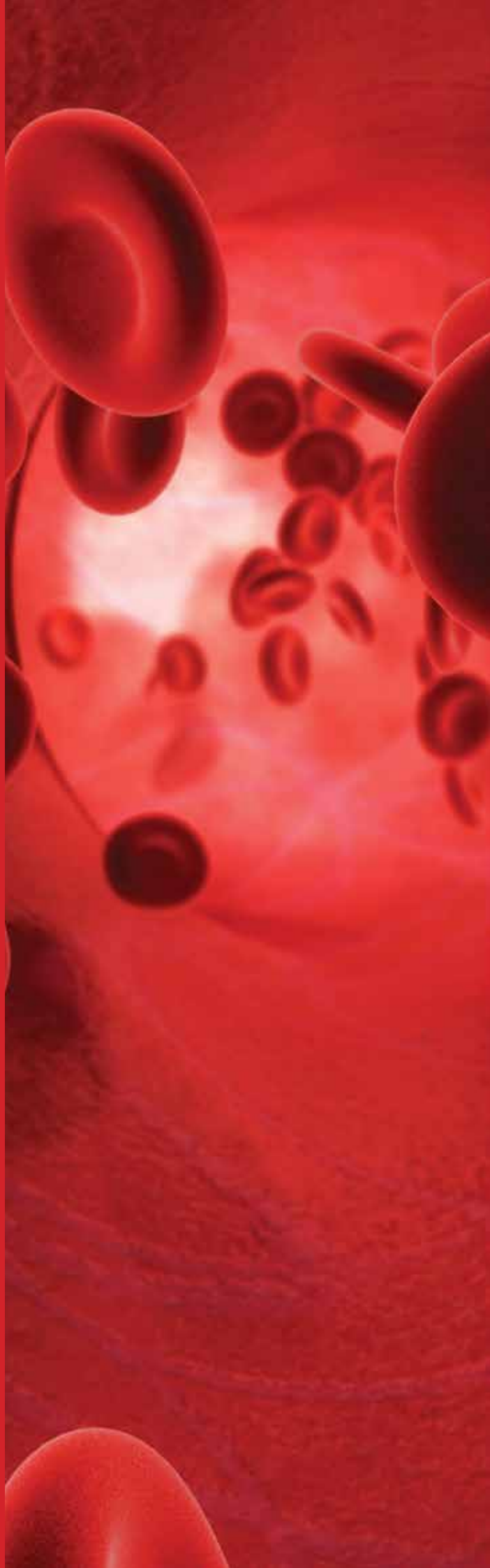

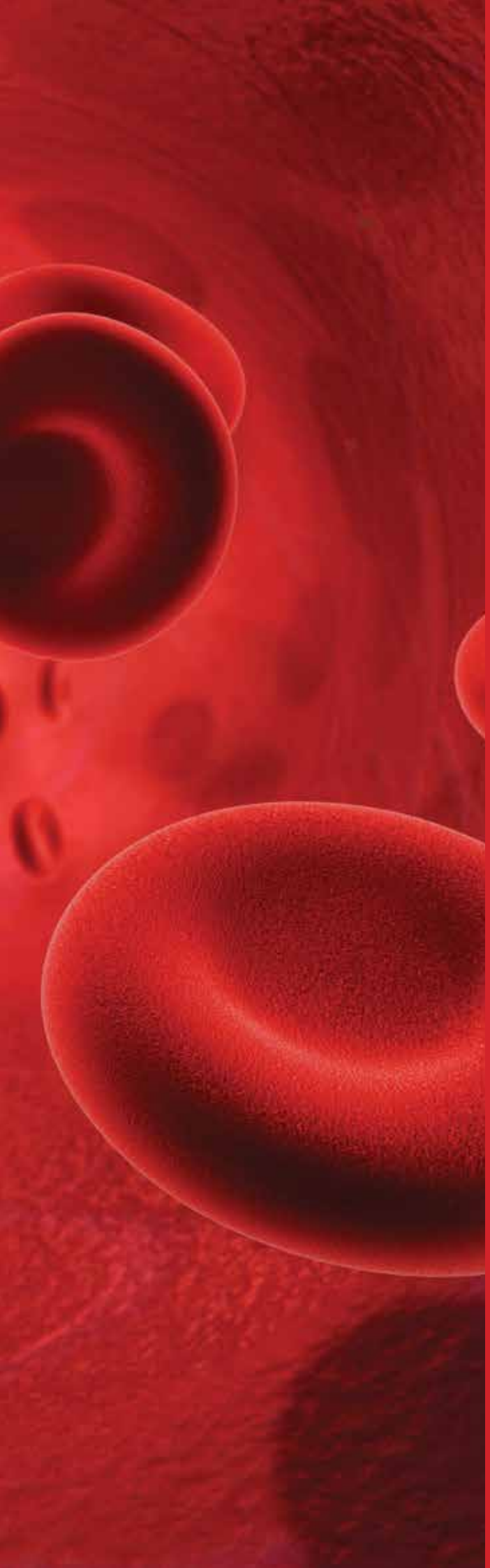

ABOUT VTE

Venous thromboembolism (VTE) is a condition in which a thrombus – a blood clot – forms in a vein. Usually, this occurs in the deep veins of the legs and pelvis and is known as deep vein thrombosis (DVT). The thrombus or its part can break off, travel in the blood system and eventually block an artery in the lung. This is known as a pulmonary embolism (PE). VTE is a collective term for both DVT and PE.

With an estimated incidence rate of 1-2 per 1,000 of the population, VTE is a significant cause of mortality and disability in England with thousands of deaths directly attributed to it each year. One in twenty people will have VTE during their lifetime and more than half of those events are associated with prior hospitalisation.

Chair's Foreword: Andrew Gwynne MP

Dear Colleague,

As Chair of the All-Party Parliamentary Thrombosis Group (APPTG), I am delighted to launch the following NHS Innovation Showcase document, highlighting examples of innovative initiatives in DVT pathway redesign from across the NHS.

Given the historical burden of hospital-acquired thrombosis in the NHS, the APPTG made improving VTE prevention in our hospitals its key priority since its inception. We are very proud of the progress that the NHS has made in embedding high quality VTE prevention in its systems and processes to date. The recently published outcomes data, highlighting a significant reduction in VTE-related deaths following the introduction of the national VTE prevention CQUIN goal, is testament to the fantastic work undertaken by clinical leaders and NHS staff across the health service as part of the National VTE Prevention Programme.

We recognise that high quality VTE prevention must continue to be a clinical priority for the NHS and welcome the fact that VTE risk assessment has been made a National Quality Requirement for 2014/15. However, we also know that not all VTE cases can be avoided and that thrombotic events acquired in the community are particularly difficult to prevent. It is therefore of utmost importance that services designed to diagnose and treat DVT in primary care are operating as effectively as possible, delivering accurate diagnosis and initiating appropriate treatment in a timely manner.

It was with concern that the APPTG found, through a survey of over 800 GPs, that only one third of GPs would say that they are fully aware of what constitutes best practice in diagnosing patients with suspected DVT and that they are very confident when following this process in practice. Furthermore, three quarters of GPs indicated that they have not received formalised structured education on best practice in diagnosis and management of venous thromboembolic diseases in line with the recently published NICE Clinical Guideline 144 and NICE Quality Standard 29.

The following NHS Innovation Showcase document forms part of the APPTG's campaign to support and encourage improvement in DVT diagnostic and treatment services in primary care. The document provides an overview of national best practice guidelines and showcases five case studies of areas where clinical leaders successfully redesigned the local DVT pathway by moving the diagnosis and treatment of non-complex DVT patients into primary care in order to avoid unnecessary hospital admissions. As you will learn from the following series of case studies, in many cases, diagnosing and treating DVT in a primary care setting has the potential to speed up the treatment process, improve patient experience and save money for the NHS by decreasing the reliance on costly secondary care services.

We recognise that none of the following five examples represents a 'silver bullet' and may require slight adjustments in order to be readily transferable to areas with different population profiles. Nevertheless, we hope that they inspire you and your local NHS organisations to explore ways in which local DVT pathways could be redesigned for the benefit of both patients and the NHS.

Andrew Gwynne MP
Chair, All-Party Parliamentary Thrombosis Group

Introduction: Best Practice in Management of VTE Diseases

Best practice in diagnosis and management of VTE diseases is captured by:

- NICE Clinical Guideline 144 (Venous thromboembolic diseases: the management of venous thromboembolic diseases and the role of thrombophilia testing)* http://guidance.nice.org.uk/CG144/NICEGuidance/pdf/English; and,
- NICE Quality Standard 29 (Quality standard for diagnosis and management of venous thromboembolic diseases). http://publications.nice.org.uk/quality-standard-for-diagnosis-and-management-of-venous-thromboembolic-diseases-qs29/list-of-quality-statements.

NICE QUALITY STANDARD 29 Quality standard for diagnosis and management of venous thromboembolic diseases	
Statement 1	People with suspected deep vein thrombosis are offered an interim therapeutic dose of anticoagulation therapy if diagnostic investigations are expected to take longer than 4 hours from the time of first clinical suspicion.
Statement 2	People with suspected deep vein thrombosis have all diagnostic investigations completed within 24 hours of first clinical suspicion.
Statement 3	People with suspected pulmonary embolism are offered an interim therapeutic dose of anticoagulation therapy if diagnostic investigations are expected to take longer than 1 hour from the time of first clinical suspicion.
Statement 4	People with proximal deep vein thrombosis are offered below-knee graduated compression stockings within 3 weeks of diagnosis.
Statement 5	People with unprovoked deep vein thrombosis or pulmonary embolism who are not already known to have cancer are offered timely investigations for cancer.
Statement 6	People with provoked deep vein thrombosis or pulmonary embolism are not offered testing for thrombophilia.
Statement 7	People with active cancer and confirmed proximal deep vein thrombosis or pulmonary embolism are offered anticoagulation therapy.
Statement 8	People without cancer who receive anticoagulation therapy have a review within 3 months of diagnosis of confirmed proximal deep vein thrombosis or pulmonary embolism to discuss the risks and benefits of continuing anticoagulation therapy.
Statement 9	People with active cancer who receive anticoagulation therapy have a review within 6 months of Confirmed proximal deep vein thrombosis or pulmonary embolism to discuss the risks and benefits of continuing anticoagulation therapy.

Historically, most patients with suspected DVT have been admitted to hospital for diagnosis, which, if confirmed, would then be followed by the initiation of low molecular weight heparin and, subsequently, warfarin. Once the treatment was started, patients' international normalised ratio (INR) would be monitored in secondary care-based anticoagulation clinics.

Evidence suggests that, given the growing availability of diagnostic tools and new treatments suitable for use in primary care, the majority of non-complex DVT patients could be managed as outpatients in the primary care setting or at home. Redesigning local DVT pathways to make greater use of primary care services might not only lead to improvements in patient experience through treating patients closer to their home but also to generating substantial cost savings for the local health economy through preventing unnecessary hospital admissions.

The true test of any clinical pathway is its ability to deliver patient care in line with best practice while minimising costs. The following five case studies were chosen for their potential in optimising local DVT diagnostic and treatment services. For each of the case studies we present an overview of their impact on patient outcomes, patient experience, their cost savings impact and implementation challenges.

*NICE CG 144 should be read in conjunction with NICE Technology Appraisal (TA) 261 on rivaroxaban for the treatment of deep vein thrombosis and prevention of recurrent deep vein thrombosis and pulmonary embolism, which was published after NICE CG 144. http://guidance.nice.org.uk/TA261/Guidance/pdf/English

Case Study 1: Bradford

Overview:

As part of an initiative undertaken jointly by the Bradford City and Bradford Districts Clinical Commissioning Groups (CCGs), local primary and secondary care clinicians worked in partnership to modernise the local DVT pathway by moving diagnosis and management of DVT from a hospital-based model to one owned and managed by the patient's GP, providing patient care closer to home.

The new pathway uses validated clinical methods to estimate the probability of DVT and guide subsequent management. Direct access ultrasound scan is used to determine the presence of a DVT, with rivaroxaban forming the basis of the treatment protocol. Secondary care remains responsible for diagnostics and haematology services for high risk patients - such as pregnant women, minimising the risk of the new pathway adversely affecting patient safety.

This new pathway represents a step-change in the diagnosis and management of DVT that could be adopted at scale and at pace across the NHS. This new approach to DVT diagnosis and treatment facilitates full and consistent implementation of NICE CG 144 as well as NICE TA 261. It is estimated that the application of this pathway in a population of 440,000 will result in an annual net saving of £500,000.

Pathway implementation process:

The initial preparatory work involved the development of the first draft of the pathway, informed by a comprehensive consultation with all GPs across the two CCGs involved. A concurrent process with secondary care clinicians, particularly radiology, haematology and acute medicine, was undertaken with AntiCoagulation Europe acting as a critical friend to offer a patients' perspective.

Once the clinical agreement in support of the new pathway was reached, it was necessary to reflect the changing nature of workflow in contracts with service providers. Specifically, it was important to ensure that the income flow into secondary care reflected the work done by the various departments involved. In effect, this meant moving income out of A&E and the Medical Assessment Unit (MAU) and into radiology.

> *"We were getting clear and consistent feedback that the existing DVT pathway was poorly understood and there was poor compliance from both patients and clinicians, which increased the risk of poor treatment outcomes. The new pathway will save money, improve the patient experience by ensuring they avoid unnecessary hospital admissions and deliver better health outcomes."*
>
> **Dr Matt Fay, GP and Long-Term Conditions Lead for NHS Bradford City CCG**

In implementing the new pathway within the existing service model, care was taken not to destabilise existing services. Work needed to be carried out to make sure that patients diagnosed through the new system were followed up by the local haematology clinic. This included setting up a joined-up IT system and governance to enable the haematology clinic to have access to the patient's primary care record.

The project leads believe that the implementation of this innovative pathway can be easily and readily replicated elsewhere in the NHS. The pathway is complete and would simply need to be re-localised by putting new clinical agreements in place and ensuring that local contracts appropriately reflect workflow.

Patient health outcomes and safety:

Given that treatment with rivaroxaban (in its indication for the treatment of deep vein thrombosis and prevention of recurrent deep vein thrombosis and pulmonary embolism) is recommended as a cost-effective option by NICE, the pathway is no less effective or safe than the current hospital-based service delivery model. It could be argued that the clinical outcomes delivered by this pathway could even improve as a result of greater patient concordance with their treatment, given its increased simplicity. A full clinical audit of the impact of the new pathway is underway and the results will be published shortly.

Patient experience:

Initial feedback from patients was overwhelmingly positive. Patients have said that being able to stay at home, rather than being admitted to hospital for diagnosis and treatment is convenient for them as well as their families. For example, one of the first patients to experience the new pathway was frail and vulnerable to infection. Throughout his progress through the treatment pathway, this patient was able to remain in his care home and completely avoid hospital admission. In the first month of the new pathway 81 patients avoided a spell in the MAU.

Cost savings:

According to the project leads' analysis of cost impact, the pathway delivers substantial net savings. It is estimated that in the local population of 440,000 approximately 3,000 patients will develop a suspected DVT every year, of which 1,900 will present to a GP and will require D-dimer. Approximately 1,300 patients will then be referred for an urgent radiology scan. The estimate of the net cost of the two diagnostic tests combined is £77,500.

Taking drug costs into account, it is estimated that the increased annual cost of prescribing rivaroxaban is £150,000. Thus the total cost of implementing the new pathway in a 440,000 population is £227,500. However, the pathway's implementation obviates £140,000 spent in secondary care anticoagulation clinics and £600,000 as a result of patients no longer requiring a spell in the MAU. Therefore, the net cost of implementing the new pathway is an annual saving of £512,500.

Detailed financial modelling will be undertaken with actual activity data over time. In the first month of operation, 81 patients used the pathway avoiding £26,500 in admission costs.

Contact:

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Case Study 2: Brentwood Community Hospital DVT Service

Overview:

Only 15-20 per cent of individuals suspected of having a DVT have a confirmed thrombosis. The accuracy of initial DVT assessment has been improved by the adoption and use of a Clinical Decision Rule such as the Wells score along with the measurement of D-dimer. The advent of Point of Care (POC) D-dimer testing has enabled initial assessments to be carried out in the community, thus decreasing the need for patients to attend a hospital-based service. Community-based DVT assessment services also provide easier accessibility for patients and their GPs. South West Essex Community Services, part of the North East London Foundation Trust, thus established a community-based DVT Service at Brentwood Community Hospital (BCH) in 2009 to improve the DVT diagnostic services for the nine GP practices in the local area, serving a population of 76,000.

Patients presenting to their GP with a suspected DVT are referred via a phone call or electronically direct to the DVT service at BCH. This enables patients to be seen at the earliest possible opportunity and without undue delay on arrival. Patients are assessed with a Wells score and a quantitative POC D-dimer blood test. Those with a low Wells score (one or less) and a normal D-dimer, approximately one third of patients, can safely have a DVT excluded. If the Wells score is two or more, and/or the D-dimer is raised, an on-site Doppler scan is performed. Patients with scan confirmed DVTs could then have anticoagulation treatment initiated and monitored by the on-site community anticoagulation clinic. The service is predominantly nurse-led and is supported clinically by senior consultant haematologist, Dr Andrew Hughes, who is in the unique position of being the only haematologist in the UK exclusively based in primary care and who was responsible for the initiation and development of this service.

In order to improve the efficiency and cost-effectiveness of the service an additional simple, non-invasive screening test, Strain Gauge Plethysmography (Venometer V3) was introduced in 2011. It is likely that this will permit more than 50 per cent of patients to have a DVT safely excluded without the need for a more expensive Doppler scan.

Pathway implementation process:

Having a local fixed facility, that included a Doppler scanner, with existing multifunctional nursing staff and with the availability of a reliable POC D-dimer test it was possible to set up a community-based service at BCH. The existing nursing staff was specifically trained to carry out the initial DVT assessments and to provide the associated anticoagulation service using a capillary POC INR test and computer decision software for Warfarin dosing. Specialist vascular sonographers from a local acute trust were engaged to provide the onsite Doppler scans. The service was supported from its inception by the local GPs, and a consultant haematologist, Dr Hughes, was engaged to implement, develop and clinically support the service.

Patient health outcomes and safety:

From April 2009, when the service started, up to August 2013, 1,090 patients with suspected DVTs have been seen. This breaks down to approximately 20 patients per month and 250 per year. This represents a 70 per cent decrease in the expected number of patients with suspected DVTs who previously would have been referred to hospital. One third of patients had a DVT excluded on initial screening. 127 patients (12 per cent of those referred) had DVTs confirmed by Doppler scanning and have had all their anticoagulation treatment organised and supervised locally. Those patients without DVTs are often able to have alternative diagnoses made and treated by the senior nursing staff, for example cellulitis, thus providing a more comprehensive and holistic service. As an important outcome measure, the DVT service staff contact all patients discharged back to their GPs with a DVT excluded 3 months later, to ascertain if they have had a thrombosis diagnosed during this time. Since this has been routinely done in the last year no such patient has had a thrombotic event within this three-month period.

Patient experience:

Having a locally available comprehensive DVT assessment, diagnosis and management service allows GPs and their patients with suspected DVTs more rapid access to diagnostic services without the need to travel to more distant acute hospital-based facilities. This is particularly useful for older patients, especially as 54 per cent of the patients referred to BCH are over 70 years old. Patients are commonly seen on the day of referral and usually within thirty minutes of arrival at BCH. If a Doppler scan is required, 50 per cent of patients are able to have it done on the day of referral and 75 per cent within 24 hours. The associated anticoagulation service permits local anticoagulant treatment of those with confirmed DVTs, thus preventing frequent journeys to and from a secondary care facility. All this is more convenient and less stressful for patients, and has been much appreciated by those who have used the service.

Cost savings:

Referral of a patient with a suspected DVT direct to secondary care may cost approximately £300 per referral. Thus if the 250 patients seen at BCH each year were all to be referred to secondary care this would cost approximately £75,000. The cost of providing the local service at BCH is approximately £20,000, an annual saving to the local health economy of approximately £55,000. Additional financial savings are also made as patients requiring anticoagulation treatment can have this managed locally. Savings are also made in both time and efficiency. This meets the sought after goal of a locally enhanced service provided at lower cost.

Contact:

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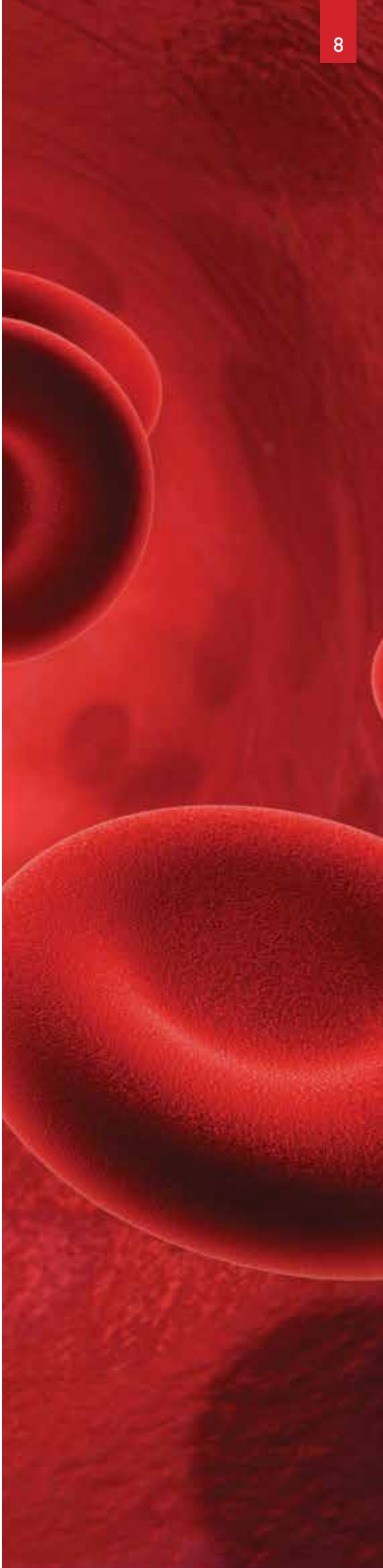

Case Study 3: GP Care's Community DVT Service

Overview:

GP Care has been providing a comprehensive Community DVT Service for NHS patients living in the Bristol and South Gloucestershire area for the last six years. By moving the service out of secondary care and into primary care, the aim has always been to improve the patient's overall experience as well as to deliver significant savings to local NHS commissioners.

The Service can be split into three distinct phases:

Phase 1: In line with NICE guidance, the referring GP uses the Wells score criteria and near patient D-dimer testing to assess the clinical probability of DVT.

Phase 2: Where probability of DVT is high, the patient receives a guaranteed same or next day ultrasound scan at one of five anticoagulation clinics.

Phase 3: Where DVT is confirmed, the patient attends for anticoagulation therapy at a local GP surgery. The registered GP receives a full record of treatment and a management plan by fax on the day of discharge.

Until July 2012, patients with a confirmed DVT were treated with warfarin and injections of Low Molecular Weight Heparin (LWMH). Following NICE approval of rivaroxaban as an oral anticoagulant for patients with DVT, GP Care developed a safe alternative pathway to the existing warfarin pathway.

The aims of introducing the rivaroxaban pathway were:

- Greater choice for patients regarding their treatment plan;
- Further cost benefits to the NHS;
- Further development of working relationships with primary and secondary care;
- Benefits to patients:
- Less impact on daily life, more independence;
- Less time spent at GP surgeries;
- Broaden inclusion criteria for community care.

Pathway implementation process:

Since warfarin was licenced in the 1950s as the only oral anticoagulant for treatment of DVT, the medical community has been aware of its limitations. These include continual dosage changes, regular interaction and INR monitoring as well as dietary and drug considerations.

Despite wide coverage of the licensing of rivaroxaban for treatment of DVT, there has been a slow uptake in offering it to patients in many areas of the country. Where many health providers look to avoid risk, GP Care looks to identify and manage the risks by carefully constructing a safe treatment pathway with a stringent governance infrastructure; GP Care has taken every necessary step to ensure that patients receiving rivaroxaban are well managed and appropriately supported.

Working closely with the Head of Medicines Management at NHS Bristol, GP Care developed a safe and robust governance structure to allow the introduction of rivaroxaban as a treatment option in DVT. Key to the success of the introduction of rivaroxaban was close and regular liaison with a wide ranging clinical team including GPs, hospital consultants, specialist nurses and pharmacists.

At every stage it was essential to ensure that our local partners were able to give feedback or comment on GP Care's concept for a new community pathway, including the North Bristol NHS Trust's working party for VTE management of which GP Care is a member.

Patient health outcomes and safety:

The outcomes of this initiative were assessed through a continuous review programme. GP Care has a rigorous audit regime and with patient feedback rates of 65 per cent, it was able to closely monitor the efficacy and suitability of rivaroxaban for different patients.

As part of its Patient Participation Involvement Strategy, GP Care contacted patients by telephone following discharge for a more in-depth dialogue. Whilst GP Care has noted a patient preference for rivaroxaban, GP Care's specialist GPs are always careful to ensure that this is the appropriate choice. As a result it has been essential to continue offering the existing warfarin pathway alongside the new treatment schedule.

Despite these initial pressures in the early stages it did not take long for GP Care to realise the benefits to its patients being treated with rivaroxaban. Most notably it found:

- Patients have felt a greater sense of involvement in their care decisions;
- Patients have more independence and the treatment has less impact on their daily lives - this is particularly pertinent for patients who work or study full time or may have transport issues;
- Patients have commented that they have chosen rivaroxaban to avoid daily injections of LMWH to the stomach;
- Fewer dietary considerations;
- Dosing requirements are more straightforward compared to warfarin, where doses are continually changed according to INR levels.

While there has been much debate about the potential financial benefits compared to warfarin, GP Care has realised a noticeable reduction in the cost of a rivaroxaban pathway and has passed these savings directly to the local NHS commissioners.

The results of this innovation add further to the key outcomes of the DVT Service as a whole which, to date, include:

- 97.5 per cent of patients rating their overall experience as "Excellent" or "Very Good";
- Meeting NICE Guidance;
- GPs feeling more informed about the care of their patients;
- 100 per cent of patients being offered ultrasound scan on the same or next working day as referral;
- Hospital clinicians being able to dedicate their attention to patients with more acute conditions.

Patient experience:

GP Care asked every patient for feedback on their experience, of which the following verbatim comments are typical:

- *"The DVT came as a great surprise to me. I was given reading material but only knew of warfarin through other people on it but I wasn't sure I wanted all the toing and froing to appointments so chose rivaroxaban. Rivaroxaban was very, very good"* – **82 year old female, telephone interview.**
- *"Many years ago I had to undergo warfarin treatment and my memories of having to wait hours in a corridor for a blood test, twice weekly, still give me the heebie-jeebies! The service now offered is truly excellent and I can't praise it enough. Thank you."* – **52 year old female**.
- *"If someone asked me what to go on I'd say rivaroxaban. It's one tablet a day, it's easy"* – **52 year old male, telephone interview.**
- *"Excellent service all round. A credit to the NHS. 10/10 on everything. Thank you very much."* – **42 year old female**

Cost savings:

GP Care's Community DVT service has resulted in an estimated 14,000 hospital attendances avoided, and an estimated savings to NHS commissioners of £2.5million (compared to local hospitals).

Contact:

Dr Phil Yates, GP Care Chairman

Case Study 4: Luton Treatment Centre Community DVT Service

Overview:

The Community DVT service in Luton is provided by Cambridgeshire Community Services NHS Trust and is unique in its area. The DVT service, based at the Luton Treatment Centre, was established in June 2006. All patients registered with a Luton GP and suspected of having a deep vein thrombosis are referred by the GP to the DVT clinic. GP referrals are initiated via a dedicated mobile phone number for the DVT sister. The GP completes a referral form and criteria assessment form and obtains an appointment from the DVT sister for the patient to be seen on the same day.

The patient brings the completed GP referral documentation to their allocated appointment time. The nurse then undertakes a thorough verbal assessment to understand the patient's symptoms, followed by a clinical examination to assess the probability of DVT using the Wells' criteria and creates a clinical score.

Following identification of the patient specific clinical score, the nurse then initiates the appropriate course of treatment:

1) Low clinical score (1 or below): proceed to undertake a D-dimer test. The D-dimer test is performed on site. A venous blood sample is taken. It is spun down to separate the plasma from the red blood cells and a D-dimer test is then run on an ACL 300 machine on site (compared against the Luton and Dunstable Laboratory Top 300 ACL machine, daily quality control and the National External Quality Assessment Service {NEQAS}). The cut off value for the machine is 450 ng/ml. With a low Wells' score and a negative D-dimer result, a DVT can be excluded. Should the D-dimer result be positive please see point 2.

2) High clinical score (2 or above) or a low clinical score with a positive D-dimer result (450ng/ml or above): LMWH (low molecular weight heparin) is commenced using a Patient Group Direction (PGD) (agreed by GP on referral to service). The patient is referred directly for an ultrasound scan of the symptomatic leg at the Luton and Dunstable Hospital. The scan will diagnose or exclude a DVT. If the scan is negative, the patient is discharged back to their GP. If the scan is positive the patient then attends the anticoagulant clinic at the Luton and Dunstable Hospital where warfarin is commenced and LMWH injections continue until the patient's INR levels are therapeutic. The maintenance therapy is then transferred back to LTC to provide ongoing care and treatment.

Pathway implementation process:

The DVT pathway was introduced in 2006 in agreement with the Luton GPs, the consultant haematologists at the hospital, the ultrasound scan department and the anticoagulant clinic at the hospital. Agreed communication protocols ensure effective communications across the pathway and ensure patients receive the best care possible.

Any patient who has a Luton GP will be referred to the Luton Treatment Centre (LTC) on the Community DVT pathway. This ensures the most effective use of resources and avoids attendance at A&E, Emergency Assessment Unity (EAU) and other departments, as well as alternative more accessible assessment and treatment as an outpatient in the community.

The GPs are aware of the pathway and they are also aware that the patient is seen and assessed on a same day basis ensuring any risk is minimised. Should the patient not meet the criteria to attend the DVT service, the GP will refer them to the hospital. If the patient deteriorates while at the DVT clinic or a clinical issue arises that requires a hospital referral, this is initiated.

Patient health outcomes and safety:

The patients who are seen within the community DVT service are deemed appropriate for referral through the initial contact with their GP. On arrival at the DVT clinic, the nurse again assesses their suitability for the service. If the patient becomes unsuitable or develops clinical problems (e.g. chest pain or shortness of breath) they are referred by the LTC into the hospital to be seen by the medics to ensure the safety of the patient. Most of the DVT patients referred into the service are negative to DVT either at the point of D-dimer test or otherwise by ultrasound scan. The scan department informs the patient of their result immediately and either signposts the patient to the anticoagulant clinic or advises them to see their GP (in the latter case, the service will provide a 'negative' discharge letter).

We access results immediately and make sure that patients have attended the anticoagulant clinic as appropriate.

Once the initial anticoagulation treatment has successfully returned the patient to a therapeutic INR range, the care is transferred back to the community anticoagulant clinic for ongoing monitoring until the patient's anticoagulant therapy is concluded.

Patient experience:

The following patient experience information was taken from the LTC's patient engagement tool used from January 2014. These are the comments that the patients seen had to say about the community DVT service in Luton:

- *"Excellent service"*
- *"The service was very pleasant and the nurse was professional and most helpful"*
- *"Saw me straight away, took time examining me"*
- *"The nurse put me at ease"*
- *"The nurse made me feel very relaxed"*
- *"I was seen promptly"*
- *"Everything explained in full"*

Cost savings:

The service, which was established in 2006, was actually introduced as a "spend to save" initiative recognising the significant costs of patients with suspected DVT being seen at A&E or EAU.

Cambridgeshire Community Services NHS Trust established a pathway that allowed suspected DVT patients to be seen in the community, the bulk of the referrals being negative to DVT and requiring no further treatment. The equipment (an ACL machine – which is most effective for D-dimer testing) was researched and purchased and nurses already working for the community anticoagulation service were specifically trained in assessment and treatment planning. The cost of an admission charge was avoided with every referral into the service rather than into the hospital.

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Case Study 5: Swindon Urgent Care Centre DVT Service

Overview:

SEQOL is a social enterprise, a not for profit organisation working in collaboration with the NHS serving patients in Swindon and the surrounding areas. The DVT service is nurse led, seeing on average 1,500 patients per annum. The service is staffed within the Urgent Care Centre 24 hours a day 365 days a year. It is based on the site of the Acute Hospital Trust; however it is a primary care service. Patients are initially seen within the Urgent Care Centre, or within their own homes and are managed until a diagnosis of DVT is confirmed or excluded. Patients with a confirmed DVT are reviewed by the anticoagulation team of the Acute Trust for continued treatment. Patients with a confirmed DVT return to the Urgent Care Centre 1-2 weeks after diagnosis for a physical examination, chest X-ray, urinalysis and health promotion discussion. At this point patients may also be signposted to external agencies for support, e.g. Lifeblood: The Thrombosis Charity.

One challenge within the service has been to have same day ultrasound scans, however due to unpredictable service need due to referral peaks and troughs and a national shortage of vascular sonographers. This has historically resulted in the excessive use of anticoagulation while definitive diagnosis is pending. In response to this, SEQOL are pioneering a nurse led ultrasound diagnosis service in the Urgent Care Centre. Nurse Practitioners, in collaboration with the University of the West of England, have undertaken post graduate training to become sonographers. Purchase of an ultrasound machine will enable same day diagnosis. This innovation will improve the care we offer at the point of contact, making it safer, quicker and more client focussed whilst reducing costs associated with staff time, clinic appointments, drug therapy and unnecessary blood tests.

Pathway implementation process:

SEQOL is commissioned by both Swindon and Wiltshire CCGs to provide DVT assessments. The DVT team liaises with local GP services offering training sessions including presenting at GP update sessions. All clinical notes are faxed to patients' own GPs to ensure awareness of treatment plans and results of any investigations undertaken.

Patients are referred to the service by their own GPs, hospital out-patients, emergency departments, walk-in centres and other health care professionals e.g. Community Matrons and practice nurses. Patients are also able to self-refer to the service. Patients from any geographical area are accepted onto the pathway. Patients who are housebound within the Swindon area are assessed within their own home wherever possible. All patients are offered an appointment within 4 hours of referral. SEQOL's other services are frequently utilized and the DVT team is able to refer seamlessly to the community nursing team for administration of LMWH for patients unable to attend for daily injections.

The DVT service has close links and relationships with other services within the Acute Trust including the anticoagulation team. A recent example of this was the introduction of rivaroxaban for treatment of acute DVT, initially just for management of provoked distal DVT progressing to treatment of all DVTs (subject to fulfilling the criteria) from November 2013. We also work closely with other departments including the radiology department, Ambulatory Medical Unit and the Emergency Department. This ensures a robust, joined up service when delivering patient care.

The development of the ultrasound pathway service was supported by the vascular sonography department of the Acute Trust who provided mentorship and training and continue to offer both clinical guidance and quality assurance support.

Patient health outcomes and safety:

No adverse incidents have been documented on the current pathway. Because patients are seen quickly those with confirmed diagnosis of DVT are treated quickly, reducing the risk of pulmonary embolism.

Patients at high risk of pulmonary embolism are identified quickly and referred to the appropriate clinician. Patients at risk of harm from anticoagulants, e.g. those with impaired renal function, are recognized and managed appropriately.

Ultrasound scanning within the service will further reduce the risk of anticoagulant adverse reactions.

Patient experience:

Patient feedback for the service is highly complementary, patients often comment on levels of professionalism and compassion, with comments including:

- "I have been incredibly impressed by every single member of the SEQOL I have seen in the last few days"
- "The service the team provides is second to none and an example for all other health service professionals to envy and aspire to achieve."
- "The team were an exemplary model of professionalism and care. If the current Secretary of State for Health thinks that nurses need to re-learn caring and compassion, then this team could lead the way."

Complaints to the service are extremely rare, but tend to relate to the wait experienced for blood results and ultrasound scans. A DVT assessment, including waiting for the return of blood results, can often take up to 4 hours. This has been a major driving force for introducing the ultrasound service into the pathway, described by Lifeblood – The Thrombosis Charity as "a one stop clot shop!".

The service is also popular with local GPs who can refer a patient via one telephone number with the knowledge that the DVT pathway team will then manage the whole patient care episode.

Cost savings:

Cost savings gained as a result of GPs referring patients directly to the primary care service rather than direct to hospital are estimated to be £171,000 per annum. The home visiting service for housebound patients prevented overnight hospital admissions in 50 patients saving in excess of £23,000 per annum.

The ultrasound service will reduce the cost of unnecessary low molecular heparin by £19,000 per annum (based on figures from 2013-14) with its use restricted to those patients with a confirmed DVT. It is also estimated that an overall saving in excess of £75,000 is likely; this is due to reduced clinician time and the reduction of unnecessary blood testing. The total saving from the service change amounts to £94,000 in a full year.

The cost of purchasing an ultrasound scanner amounts to £40,000.

Therefore, the payback for the initial outlay of the scanner is recovered within the first year of providing the service i.e. the savings outweigh the initial cost after the first six months.

Contact:

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Further Information

All-Party Parliamentary Thrombosis Group:
http://apptg.org.uk/

APPTG VTE Scorecard:
http://www.vtescorecard.com

National VTE Prevention Programme:
http://www.vteprevention-nhsengland.org.uk/

Lifeblood: The Thrombosis Charity
http://www.thrombosis-charity.org.uk/

VTE Exemplar Centres Network:
http://www.vteprevention-nhsengland.org.uk/vte-exemplar-centres

AntiCoagulation Europe: http://www.anticoagulationeurope.org

NICE Quality Standard 29 - Diagnosis and management of venous thromboembolic diseases
http://guidance.nice.org.uk/QS29

NICE Clinical Guideline 144 - Venous thromboembolic diseases: the management of venous thromboembolic diseases and the role of thrombophilia testing
http://guidance.nice.org.uk/CG144

NICE Technology Appraisal Guidance 261: Rivaroxaban for the treatment of DVT and prevention of recurrent DVT and PE
http://www.nice.org.uk/nicemedia/live/13805/60040/60040.pdf

Contact Details

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