

VTE Prophylaxis in orthopaedic surgery

The BOA, via the Professional Practice Committee (PPC), has decided to launch a 'living document' so that members, patients and the general public can reference up to date guidance on this matter of crucial importance. The living document will be regularly updated as new evidence and research become available. We welcome your feedback on this approach.

VTE PROPHYLAXIS IN ORTHOPAEDIC SURGERY: Introduction to the BOA Living document

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To say that the subject of VTE prophylaxis in orthopaedic surgery is a thorny issue may be understating the case. Debate and difference of opinion is something which is part and parcel of orthopaedic surgery and one of the many components that makes this speciality fascinating. Seldom has one single issue been the subject of so much controversy.

It was the BOA's initial intention to write a "Blue Book" on the subject, but it became obvious a year or two ago that if such a document had been produced, then it would be out of date almost by the time it left the printers. New evidence, new drugs, continuously published position statements and recent research make the topic of VTE prophylaxis an area of constantly shifting sand.

Consequently the BOA therefore, via the Professional Practice Committee (PPC), has decided to launch a 'living document' so that members, patients and the general public can reference up to date guidance on this matter of crucial importance.

The living document will be regularly updated as new evidence and research become available. The American Academy of Orthopaedic Surgeon (AAOS) already has such a facility in place. For those of you who have not accessed the AAOS website, it is recommended that you do so. The BOA website will provide a link to this already available and valuable resource. It is important, however, that the BOA have their own reference point as the philosophy of VTE prophylaxis differs in some respects to our American colleagues. For example Warfarin (Coumadin) is used more often as routine prophylaxis in North America than it is in the UK. The role of Aspirin has also been recently hotly debated, particularly by the British Hip Society (BHS) and it now appears that this drug is a more readily acceptable method of chemical prophylaxis than it was the case in the past¹.

NICE published guidelines in 2010² recommending that for most major lower limb orthopaedic procedures prophylactic measures should include physical and chemical modalities. Few of us object to physical measures such as graduated compression stockings, intermittent calf compression or foot pumps. The common-sense interventions such as early mobilisation and adequate hydration cannot really be argued against and appear universally accepted. Many of us will now mobilise our hip and knee replacement patients on the day of surgery, encourage self-care and early discharge from hospital. A move away from femoral and sciatic nerve blocks towards neuraxial anaesthesia has facilitated this process.

The use of chemical prophylaxis has been the area of most debate and controversy. Over the last two decades many surgeons have used low molecular weight heparin (LMWH) or sometimes Fondaparinux. However, the dosage, timing of administration and duration of treatment remained variable and was not always complicit with the manufacturers' recommendations. There were also reports of bruising, leaking wounds, haematoma formation and the phrase "Clexane or Fragmin Leg" was coined.

In recent years, a new group of drugs have been introduced to the market, the direct thrombin inhibitors: Rivaroxaban, Dabigatran and Apixaban. These new drugs have the distinct advantage that they can be taken orally rather than injected. Administration is therefore easier. However, we still receive reports that these oral anti-

coagulants have similar side effects to the injectable preparations. Nevertheless, this new generation of drugs do appear to be becoming more widely accepted. Indeed, many patients expect to receive some form of chemical prophylaxis and should be given appropriate information and an opportunity to discuss VTE prophylaxis prior to their surgery.

Data from the National Joint Registry for England and Wales (9th Annual report)³ show that in 2011 for hip and knee replacement patients, LMWH was the most frequently prescribed chemical method of prophylaxis (71% and 70% respectively). The usage of aspirin has decreased from 20% in 2009 to 9% in 2011. Direct thrombin inhibitors were used in 11% of primary hip procedures and in 10% of primary knee procedures.

There is no attempt by the BOA to be prescriptive and dictate strict guidelines. Rather we encourage all orthopaedic surgeons to look at the available evidence and formulate a VTE strategy for their department. Proposed departmental guidelines should be submitted and then approved by the hospital's drug and therapeutic committee and also the VTE group, if one exists. We recommend that wherever possible NICE guidelines are adhered to and we particularly emphasise that all patients should have a VTE assessment carried out prior to or on admission to hospital. This assessment should be regularly updated throughout the patient's length of stay.

We recognise that a number of accepted regimes exist and that in some cases there may be surgeons with differing views within a department. We do consider that it is acceptable for there to be more than one VTE strategy within a department. However, it should be recognised that the existence of more than one regime in the same department may represent an additional risk to the patient, since it may encourage prescribing errors and other errors of either omission or commission. It is important that any such regime used should be compliant with existing prescribing policies and that each regime should be approved by the relevant committees in the hospital. It is also wise to limit the number of such policies within a unit as much as possible.

The PPC have asked the specialist societies to supply their advice for VTE prophylaxis in their relevant fields and these short summary documents will be available on the website. The advice is referenced and considered best practice.

Clearly the risks of VTE are higher in some patients than others. The risks are higher in patients with lower limb conditions than those undergoing upper limb procedures. Upper limb surgeons seldom appear to recommend routine VTE prophylaxis unless there are specific risk factors. Children also have a relatively low risk.

The published living document is intended to help and assist all orthopaedic departments. The advice is not prescriptive or rigid and if a surgeon considers that the risk of providing chemical or physical VTE prophylaxis outweighs the benefits (for example if there is a bleeding risk), then there will be occasions when chemical prophylaxis can reasonably be with-held. The reasons should be clearly documented and recorded contemporaneously in the medical records.

The PPC welcomes comments and suggestions from all parties on the VTE living document. Inevitably there will be changes, additions and redactions as time goes by. The issue of VTE prophylaxis is a constantly evolving process as new publications and research come into existence.

Please let us have your feedback!

References

1. Barrack RL. Current guidelines of Total Joint VTE prophylaxis. Dawn of a New Day. JBJS 2012 94-B No. 11
2. Venous Thromboembolism: Reducing the Risk. NICE Jan 2010
3. National Joint Registry for England and Wales. 9th Annual Report. 2012

BOA Background Document – VTE in orthopaedics

August 2013

In Orthopaedics VTE prophylaxis was highlighted in the first American Chest and Cardiac Physicians report recommending prophylaxis for all. This has been constantly updated. The recent iteration (which post-dates the NICE guidance)¹ has recognised the delicate balance between risk and benefit for orthopaedic patients undergoing major surgery, particularly the risks of wound bleeding; often not reported in the many studies but causing significant long term morbidity². These guidelines have been agreed with the American Academy of Orthopaedic Surgeons and indeed many quality commissioners in the US³.

Many of our members are having difficulty with the enforcement of top down prescription for their patients with which they fundamentally disagree. Together with all the major English speaking orthopaedic associations, and the British Hip and Knee Societies, we believe there is now sufficient evidence for our position.

The issue is not that VT episodes are not a problem, they can be, nor that their prevention is not a priority, it should be, but there is almost universal prescription of drugs for too short a period or coupled with aspirin on discharge, a compromise (perhaps to justify cost but not based on your evidence base). Also the apparent neglect of those with significant personal risk for which there is no specific guidance (because of a lack of evidence) but clearly require prophylaxis (e.g. ankle fractures in those with a previous PE) there remains a problem.

This leads to potentially preventable events, increased problems from prophylaxis and much increased cost to the system due to the creeping increase in duration, universality of treatment and fear of litigation (an inappropriate threat used by medical managers) because of increased drug costs.

The use of mechanical forms of prophylaxis and early mobilisation should be universally supported where relevant, often they coincide with good practice for enhanced recovery.

The responsible assessment and risk stratification of the patient should be universal, specific to the patient and agreed with the patient.

Risk assessment ('No decision about me without me') should be undertaken in all cases and preferably by the operating surgeon at a suitable time, which should not be immediately before surgery, when often the issues and concerns are rushed and poorly understood. These decisions should be agreed with the patient and recorded. A balance of the risk versus the benefit for that patient at that time is key to consent. There should be a record of the joint decision. This could be a measurable standard of quality.

Furthermore we would like to suggest that those identified with a very high personal risk (thrombophilia and active cancer) are treated for a minimum period of 4 weeks with an agent which specifically and optimally reduces the risk of DVT after due assessment of risk. This recognises both the historical data and contemporary thought⁴. The physiological response to surgery lasts 4-6 weeks and can be accentuated by stopping an active antithrombotic which causes rebound thrombophilia and will almost certainly compound the effects of surgery.

It is illogical to recommend shorter periods of prophylaxis for other conditions just because there have been no studies on the specific conditions or drugs (this in itself raises questions about the evidence base). This increase in duration will increase cost but reflect modern thinking.

There are clearly debates to be had about this but again there can be little doubt that prolonged (4 weeks) prophylaxis is necessary to cover the period at risk for all patients started on active treatment. There will be arguments as to the exact nature of "prolonged" prophylaxis however this probably insoluble debate should not detract from the requirement nor support the continued use of expensive treatments for all.

We recognise that those with increased risk of VTE by dint of short term immobilisation or joint replacement (but not with a previous history of VTE or active Ca) require prophylaxis for 4 weeks. However, for these (general arthroplasty) patients the absolute risk of a VTE is much less than the previously noted very high risk group (though still elevated) even if they are obese or elderly. In both groups the incidence of a cardiac event is actually higher than a VTE with current early mobilisation schedules. In this specific group of patients (without other very high risk factors) we would also recommend 4 weeks prophylaxis however there should be the option of using Aspirin. Aspirin is known to have an anti-thrombotic effect as noted in the network analysis in the supplement to the NICE guidelines (and not as erroneously recorded in the SIGN guideline). This would be in keeping with the new ACCP guideline endorsed by all the major orthopaedic associations. It would also perhaps mitigate the risk of MI. Indeed it has recently been recommended to bridge the rebound thrombophilic effect of stopping warfarin.

Recent work looking at embolic phenomena detected by CTPA, in particular the presence of peripheral emboli has raised some questions. The significance of and requirement to treat small peripheral incidentally - detected emboli is currently the subject of a large randomised trial following a smaller initial study⁵ suggesting that their presence and detection may not be relevant yet they are often used to support full anticoagulation, one of the commonest causes for readmission to hospital. The ready availability of CTPA and a low threshold for diagnosis may be leading to over-treatment and consequence. Published orthopaedic work has shown almost universal multiple small emboli occurring at the time of surgery but not causing significant physiological consequence.

Performance can be monitored by readmission with DVT or PE and immediate feedback from CTPA requests in hospital has been very successful where it has been introduced in providing live real time feedback. Process audit is expensive and its value questionable in the absence of outcome audit. The widespread use of tick boxes has been recognised as protecting the managers more than the patients. An incident audit of return to theatre should at least be carried out in those units that have been forced to use universal LMWH prophylaxis as there is widespread concern as to harm caused by the changes.

References

1. Falck-Ytter Y, Francis CW, Johanson NA, et al. Prevention of VTE in Orthopaedic Surgery Patients: antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest 2012; 141:278S–325S)
2. Galat DD, McGovern SC, Larson DR, et al. Surgical treatment of early wound complications following primary total knee arthroplasty. J Bone Joint Surg Am] 2009;91-A:48–54.
3. Specifications Manual for National Hospital Inpatient Quality Measures.
<http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier2&cid=1141662756099>
4. Berquist D et al Duration of prophylaxis against venous thromboembolism with enoxaparin after surgery for cancer N Engl J Med 2002 346 975-980
5. Gandhi R et al A pilot study of computed tomography detected asymptomatic pulmonary filling defects after hip and knee arthroplasties J Arthroplasty 2011

Useful Information

Specialist Societies

As part of the BOA's living document on VTE, a number of specialist societies have provided their VTE resources which are compiled within the document [here](#). This document is not exhaustive, but those available may give more specific and relevant advice for the specialist area concerned.

NICE

- Current NICE guideline – National Clinical Guideline Centre (2010) Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital – [Clinical Guideline 92](#)
- [BOA 2013 correspondence](#) with NICE regarding CG92
- [BOA perspective on NICE guideline CG92](#) 'Venous thromboembolism: reducing the risk' in relation to use of aspirin for DVT prophylaxis

Other useful documents

- AAOS (2011) Preventing Venous Thromboembolic Disease in Patients Undergoing Elective Hip and Knee Arthroplasty – [see here](#)
- Robert Barrack (2012) Current guidelines for total joint VTE prophylaxis: dawn of a new day, JBJS Br – [see here](#)
- National Joint Registry for England, Wales and Northern Ireland (2013) 10th Annual Report – [see here](#)
- Journal of Trauma and Orthopaedics (2014), First Do No Harm: A New Approach to VTE Prophylaxis – [see here](#)
- Stockport NHS Foundation Trust documentation:
 - Trauma and orthopaedics department VTE prophylaxis guidelines – [see here](#)
 - Lower limb immobilisation VTE risk assessment tool and treatment protocol – [see here](#)

On the use of IVC filters the following paragraphs have been written by the Professional Practice Committee (PPC) Chair:

"In considering the broad issues of VTE prophylaxis the PPC was keen to offer advice to members on the difficult area of Using IVC Filter devices. Information and advice were obtained from various sources including the British Haematological Society, local Haematologists and Radiologists at various Trusts and the members of the PPC themselves.

It became clear that this is an area of practice fraught with risk and lacking in evidence. We do not feel we can offer firm or authoritative advice concerning the use of these devices at this juncture. If there is a Local Radiologist with good experience of the device, a sensible protocol and clear agreed local guidelines for their use, then the PPC would not seek to discourage the use of IVC filters in those limited circumstances when it appears necessary, but in the absence of such local expertise it would probably be safer to avoid their use altogether."