

# Hospital Acquired VTE: update on national guidance

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## Aims of presentation

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### **By the end of this session you should:**

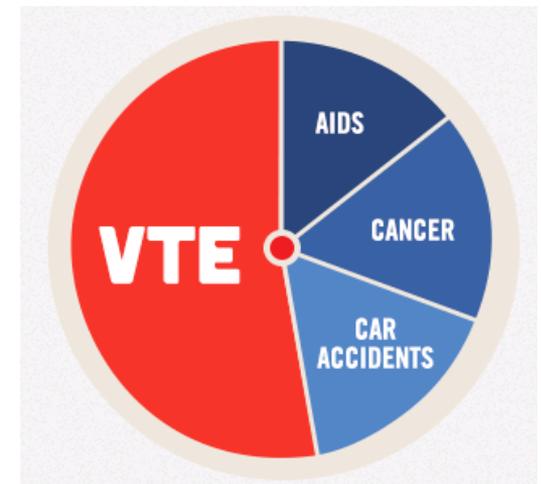
- Understand what hospital acquired VTE is and the importance of VTE prevention
- Be aware of the major changes in the new VTE prevention guideline from NICE
- Understand the rationale for the changes
- Feel confident in how to implement the changes in your Trust

## Significance of VTE prevention

- **VTE leading cause of death and disability worldwide**
  - In the UK: estimated 60,000 deaths of which:
    - 32,000 due to hospital admission
    - 25,000 are preventable
  - Up to 60% of all VTEs are hospital acquired
- **VTE is number one preventable cause of death in hospital**

*Cohen AT, Agnelli G, Anderson FA, et al. Venous thromboembolism (VTE) in Europe. Thromb Haemost. 2007;98:756-764, ISTH*

Up to **60%**  
of all VTEs are  
hospital-associated



**Therefore, VTE prevention remains a clinical priority**

# VTE burden remains!

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- **“ Globally it is estimated that venous thromboembolism cause 10 million deaths a year.”**
- **VTE leads to increased burden for clinicians and commissioners**
  - Additional cost of treatment
  - Increased length of stay
- **A systematic review of the literature on the global disease burden caused by VTE in low-income, middle-income and high-income countries (2014):**
  - Studies from Western Europe, North America, Australia and southern Latin America (Argentina) yielded consistent results, with annual incidence rates ranging from 0.75 to 2.69 per 1000 individuals in the population.
  - The incidence increased to between 2 and 7 per 1000 among those aged  $\geq 70$  years.

## Where we have come to?

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- Original NICE VTE prevention guideline published 2010 CG92
- Coincided with implementation of mandatory VTE risk assessment for all adult admissions in the UK
- This is the first full review since 2010
- Since mandating VTE risk assessment in the UK:
  - Overall death rate associated with VTE reduced by 15% with reduction of death rate from PE by 80%
- **VTE in hospitalised patients is still known to cause morbidity and mortality**

## Definition:

- **Any VTE that has occurred within 90 days of hospital discharge**
  - Can occur at any point in the patient journey and beyond
  - Surgical interventions
  - Acute medical illness
- **Effective thromboprophylactic measures shown to reduce the incidence of VTE**

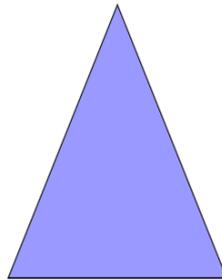
# Aetiology of VTE

## Virchow's Triad

### Risk factors for VTE linked with Virchow's triad



Circulatory Stasis, leading to abnormal blood flow  
e.g. AF, LVF, stasis, venous obstruction



Endothelial injury, causing abnormal surfaces in contact with blood

e.g. artificial valves, atherosclerosis

Abnormal clotting components leading to hypercoagulable state

e.g. protein c, s or antithrombin deficiency

**Table I.** Common risk factors for venous thromboembolism (VTE) according to Virchow's triad.

#### Reduced or altered flow

Immobility

Seated immobility thrombosis (SIT) syndrome

1) Travellers thrombosis

2) E-thrombosis

Previous VTE

Surgery

Trauma

#### Prothrombotic changes

Increasing age

Pregnancy and the puerperium

Combined oral contraception, hormone replacement therapy and oestrogen receptor modulating drugs

Cancer

Genetic thrombophilia

Antiphospholipid syndrome

Myeloproliferative disease

Obesity

Surgery

Trauma

#### Damage to vein walls

Surgery

Trauma

# Rationale for VTE prophylaxis

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- **Medical patients**

- Largest population of patients in the hospital setting
- Medical comorbidities can contribute to risk of VTE, e.g. heart failure, inflammatory conditions such as inflammatory bowel disease, rheumatological disorders, cancer, infection, stroke patients (risk of VTE is 50% in the affected leg), respiratory failure

- **Surgical patients**

- high risk of VTE: damage to endothelium, differences in blood composition and stasis
- Medical patients have similar contributing factors to surgical patients

# Pharmacological VTE prophylaxis

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- Good evidence for pharmacological VTE prophylaxis:
  - Reduces death from PE (meta-analysis)
- Medical VTE prophylaxis trials demonstrated that pharmacological VTE prophylaxis showed 2/3 reduction in VTE including fatal PE
- When considering that 75% of fatal PE is in medical patients and 25% in surgical patients, this demonstrates effective intervention.
- Cannot conclude reduction in all cause mortality as not enough patients.
- now exciting times (E.G. betrixaban) for medical thromboprophylaxis

## VTE risk: which patients to be concerned about?

**Certain groups of individuals are at increased risk:  
 (adapted from Thrombosis UK)**

Strong risk	Moderate risk	Other factors
Hospital admission for an extended period of time	Age (60+)	Obesity
Having surgery ( <i>especially hip, knee and cancer-related surgery</i> )	1 <sup>st</sup> degree/Personal history of VTE	Pregnancy or post partum (within 6 weeks of delivery)
Immobility for long periods of time ( <i>e.g., due to bedrest or long-duration travel</i> )	Cancer/active cancer treatment	Smoking
	Trauma	Alcohol consumption
	Using oestrogen-based medication ( <i>e.g., oral contraceptives or hormone replacement therapy</i> )	

# NICE VTE guideline update

- Guideline updates include:
  - assessing the risks of VTE and bleeding
  - giving information and planning for discharge
  - prophylaxis for all patients, medical patients and surgical and trauma patients
  - prophylaxis for pregnant women and women who recently gave birth, had a miscarriage or had a termination of pregnancy.

**NICE** National Institute for  
Health and Care Excellence



**Venous thromboembolism in over 16s:  
reducing the risk of hospital-acquired  
deep vein thrombosis or pulmonary  
embolism**

NICE guideline  
Published: 21 March 2018  
[nice.org.uk/guidance/ng89](https://www.nice.org.uk/guidance/ng89)

## Age

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- **Anyone 16 or over needs a risk assessment (previously was for 18 and over)**
- **Consider –**
  - **what wards will they be on:** paediatrics (training) or adults?
  - Many drugs **not licensed** in under 18s (all LMWH, fondaparinux, DOACs) – consider D&T to cover the prescription, leaflets for patients and carers

# VTE prophylaxis in Medical and Surgical patients:

Patient group	Recommendation in draft NICE guideline 2018
<b>Medical patients admitted to hospital AND Surgical/Trauma patients</b>	<p>Risk assessment: more precise wording to assess <b>all medical patients</b> for risk of VTE and offer appropriate VTE prophylaxis if risk of VTE exceeds risk of bleeding</p> <p>More specific guidance for surgical sub-specialties e.g. patients with lower limb immobilisation, fragility fractures of the pelvis, hip and proximal femur,</p> <p>If using pharmacological VTE prophylaxis, start within <b>14 hours</b> of VTE risk assessment, unless otherwise stated in specific patient groups</p>
<b>Acutely ill medical patients</b>	<p><b><i>Risk assess on admission or by time of first consultant review and offer LMWH or fondaparinux for a minimum of 7/7 if VTE risk outweighs bleeding risk starting within 14 hours of admission</i></b></p> <ul style="list-style-type: none"><li>-ensure timely administration of VTE prophylaxis</li><li>-consider what to do if patients can't self administer or likely to be in for short periods</li><li>-does not mention mechanical VTE prophylaxis</li></ul>

# Considerations for patients with renal impairment

Patient group	VTE prophylaxis
Renal impairment	<p data-bbox="537 287 1731 432"><i>Use LMWH or UFH</i> <i>Consider dose reduction based on MDT, senior opinion or local protocol</i></p> <ul data-bbox="523 496 1717 943" style="list-style-type: none"><li>-Consider data on dose reduction for LMWH</li><li>-Not much data on dose reduction apart from enoxaparin, now only licensed to 15ml/minute</li><li>-some centres perform anti-Xa level testing if concerned about drug accumulation in renal impairment</li><li>-what if patient also is of low body weight?</li><li>-is anti-Xa level testing available in your centre?</li><li>-how would you interpret the results?</li><li>-would this determine choice of parenteral anticoagulation?</li></ul>

# Pregnancy (including miscarriage and terminations)

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Patient group	VTE prophylaxis
Pregnant women and women who gave birth or had miscarriage or termination in past 6 weeks	<p><i>Consider LMWH for all women who are admitted to hospital or a midwife-led unit if they are pregnant or gave birth, had a miscarriage or had a termination of pregnancy in the past 6 weeks, and whose risk of VTE outweighs their risk of bleeding</i></p> <p>-how can this be determined if patient admitted for another medical reason?</p>

# Psychiatric illness

Patient group	VTE prophylaxis
<b>Patients with psychiatric illness</b>	<p><b><i>Assess all patients admitted to community mental health unit/hospital to identify risk of VTE and bleeding</i></b></p> <p>These centres need to have access to/have developed local VTE prevention guidelines for this patient cohort/ensure that if admitted for a medical reason or surgical intervention, then refer to relevant VTE prophylaxis guideline</p>

# Cancer

Patient group	VTE prophylaxis
Cancer patients	<ul style="list-style-type: none"><li data-bbox="527 287 1773 382">• <b><i>Do not offer to patients who are mobile, unless if risk of VTE exceeds risk of associated cancer</i></b></li><li data-bbox="527 405 1702 544">• <b><i>Consider pharmacological VTE prophylaxis for people with myeloma receiving chemotherapy with thalidomide/lenalidamide with steroids</i></b></li><li data-bbox="527 575 1702 671">• <b><i>Consider pharmacological VTE prophylaxis for people with pancreatic cancer receiving chemotherapy</i></b></li><li data-bbox="527 696 1721 792">• <b><i>Options for pharmacological VTE prophylaxis now also include aspirin</i></b></li><li data-bbox="527 818 1773 913">• <b><i>Continue VTE prophylaxis for as long as patient receiving chemotherapy</i></b></li></ul>
	<ul style="list-style-type: none"><li data-bbox="527 939 1000 979">• Practical implications:</li><li data-bbox="527 991 1379 1031">• How will these patients be risk assessed?</li><li data-bbox="527 1042 1754 1138">• Does this require additional resource to facilitate VTE risk assessment and recommending appropriate VTE prophylaxis</li><li data-bbox="527 1149 1649 1189">• Regular review as fragile group of patients-bleeding risk</li><li data-bbox="527 1200 1740 1296">• Do these patients require additional appointments to monitor them?</li><li data-bbox="527 1308 1209 1348">• Patient information and support?</li></ul>

# Palliative Care

• Patient group	VTE prophylaxis
Palliative care patients	<ul style="list-style-type: none"><li>• <i>Consider pharmacological VTE prophylaxis in this patient group</i></li></ul>
	<ul style="list-style-type: none"><li>• <i>Take into account temporary increases in thrombotic risk, risk of bleeding, likely life expectancy and views of patient/family member/carer</i></li></ul>
	<ul style="list-style-type: none"><li>• <i>Offer LMWH (first line) or fondaparinux if LMWH contra-indicated e.g. HIT</i></li></ul>
	<ul style="list-style-type: none"><li>• <i>Do not offer VTE prophylaxis in last days of life</i></li></ul>
	<ul style="list-style-type: none"><li>• <i>Review VTE prophylaxis daily according to patient clinical status, taking into account views of person, family members or carers and MDT</i></li></ul>

# Critical Care patients

Patient group	VTE prophylaxis
Critical Care patients	<ul style="list-style-type: none"><li>• <b>Assess all people admitted to the critical care unit for risk of VTE and bleeding.</b></li><li>• <b>Provide LMWH if pharmacological VTE prophylaxis is not contraindicated.</b></li><li>• <b>Consider mechanical prophylaxis if pharmacological prophylaxis is contraindicated based on condition or procedure. If using mechanical VTE prophylaxis start it on admission and continue until the person no longer has reduced mobility relative to their normal or anticipated mobility.</b></li><li>• <b>Reassess VTE and bleeding risk at least daily and more frequently if rapidly changing condition</b></li></ul>
	<p>Consider:</p> <ul style="list-style-type: none"><li>-How to record daily review</li><li>-Dosing in renal impairment/renal support</li></ul>

# Orthopaedic patients-lower limb immobilisation

Patient group	VTE prophylaxis
Lower limb immobilisation	<b><i>Consider LMWH or fondaparinux if VTE risk &gt; bleeding risk, stop at 42/7 even if immobile for longer</i></b>
	Consider: -What if purely out-patient management -What constitutes immobilisation

# Orthopaedic patients-fragility fractures of the pelvis, hip and proximal femur

Patient group	VTE prophylaxis
Fragility fractures of pelvis, hip and proximal femur	<ul style="list-style-type: none"><li>• <i>Offer LMWH (6-12 hrs post-op) or fondaparinux (6 hrs post-op) for 1 month if VTE risk &gt; bleeding risk</i></li><li>• <i>Consider pre-op prophylaxis if surgery delayed longer than day after day of admission</i></li><li>• <i>Consider IPC if can't have pharmacological VTE prophylaxis</i></li></ul>
	<p>Consider:</p> <ul style="list-style-type: none"><li>-No mention of non surgical management – elderly medicine, assume same 1/12 – consider district nurse time</li><li>-No mention of oral options</li></ul>

# Orthopaedic patients-Elective THR

Patient group	VTE prophylaxis
Elective THR	<ul style="list-style-type: none"><li>• <i>Offer if risk of VTE outweighs risk of bleeding</i></li><li>• <i>LMWH for 10/7 then aspirin 75mg (or 150mg) for 28/7 or</i></li><li>• <i>LMWH for 28/7 with AES until discharge</i></li><li>• <i>Rivaroxaban 10mg od for 35/7</i></li><li>• <i>Apixaban or dabigatran if above can't be used</i></li><li>• <i>AES until discharge if can't use pharmacological</i></li></ul>
	<p>Consider:</p> <p>-Aspirin – controversial but cheap but still have to use LMWH as well– district nurses, self admin, patient counselling, more tricky regimen of one agent for VTE prophylaxis?</p>

# Orthopaedic patients-Elective TKR

Patient group	VTE prophylaxis
Elective TKR	<ul style="list-style-type: none"><li>• <i>Aspirin 75 - 150mg for 14/7</i></li><li>• <i>LMWH for 14/7 with AES until discharge</i></li><li>• <i>Rivaroxaban 10mg OD for 14/7</i></li><li>• <i>Apixaban or dabigatran if can't use above and</i></li><li>• <i>IPC if can't have pharmacological until discharge</i></li></ul>
	<p>Consider:</p> <ul style="list-style-type: none"><li>-Aspirin controversial but easy to use, cheap</li><li>-What if already using dabigatran or apixaban – trust decision on whether to declare compliance</li></ul>

# Orthopaedic patients-non-arthroplasty orthopaedic knee surgery

Patient group	VTE prophylaxis
Non-arthroscopy orthopaedic knee surgery	<ul style="list-style-type: none"><li>• <b><i>VTE prophylaxis is generally not needed where:</i></b><ul style="list-style-type: none"><li>• <b><i>total anaesthesia time is less than 90 minutes and the person is at low risk</i></b></li></ul></li><li>• <b><i>Consider LMWH 6–12 hours after surgery for 14 days for people undergoing arthroscopic knee surgery if: total anaesthesia time is more than 90 minutes or the person's risk of VTE outweighs their risk of bleeding.</i></b></li><li>• <b><i>Consider VTE prophylaxis for people undergoing other knee surgery whose risk of VTE outweighs their risk of bleeding – no duration stated.</i></b></li></ul>
	<p>Consider:</p> <ul style="list-style-type: none"><li>-which surgery types require prophylaxis</li><li>-14 days like TKR</li><li>-duration where not stated</li></ul>

# Abdominal/thoracic/bariatric surgery

Patient group	VTE prophylaxis
Abdominal/thoracic/ bariatric surgery	<ul style="list-style-type: none"><li>• <b><i>Mechanical VTE prophylaxis on admission -AES / IPC until mobility back to normal</i></b></li><li>• <b><i>Add pharmacological (LMWH or fondaparinux) for minimum 7/7 if VTE risk &gt; bleeding</i></b></li><li>• <b><i>Add pharmacological (LMWH or fondaparinux) for minimum 28/7 if cancer surgery in abdomen or pelvis</i></b></li></ul>
	<p>Consider:</p> <ul style="list-style-type: none"><li>• Most patients won't be in for 7 days, self administration?</li><li>• District nurse admin</li><li>• 28 days for major cancer related surgery in abdomen/pelvis, as in previous guidance</li></ul>

# Head and neck surgery

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Patient group	VTE prophylaxis
Head and neck surgery	<ul style="list-style-type: none"><li>• <b><i>Consider pharmacological if VTE &gt; bleeding for minimum 7/7</i></b></li><li>• <b><i>Consider mechanical if bleeding &gt; VTE continued until back to normal mobility</i></b></li></ul>
	<p>Consider:</p> <ul style="list-style-type: none"><li>• Unlikely to be in-patients for 7 days</li><li>• data extrapolated from abdominal surgery</li><li>• very few VTE events in this group</li></ul>

# Patients on antiplatelets and anticoagulants

Patient group	VTE prophylaxis
Anti-platelets	<p><i>Consider VTE prophylaxis for people who are having antiplatelet agents for other conditions and whose risk of VTE outweighs their risk of bleeding. Take into account the risk of bleeding and of comorbidities such as arterial thrombosis.</i></p> <ul style="list-style-type: none"><li><i>•If the risk of VTE outweighs the risk of bleeding, consider pharmacological VTE prophylaxis based on their condition or procedure.</i></li><li><i>•If the risk of bleeding outweighs the risk of VTE, consider mechanical VTE prophylaxis</i></li></ul>
Anticoagulants	<p><i>Consider VTE prophylaxis for people at increased risk of VTE who are <u>interrupting anticoagulant therapy</u> e.g. patients with antiphospholipid syndrome, long term anticoagulation for prevention of VTE, AF, metal valve</i></p> <p>Consider:</p> <ul style="list-style-type: none"><li>•Development of guidelines for this cohort</li><li>•How to ensure patients have regular review and aren't on dual anticoagulation</li></ul>

# Giving information on VTE at care interface:

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## On admission: ensure patients understand reason for having risk assessment for VTE and bleeding

- Patient's risk and possible consequence of VTE
- Importance of VTE prophylaxis and possible side effects
- How patients can reduce risk of VTE (e.g. keeping hydrated, exercising, keeping mobile)
- Be aware that heparins are of animal origin, which may be of concern to some people. Discuss alternative agents with patients who have concerns

## As part of the discharge plan:

- give patients information leaflet on VTE including: signs/symptoms of DVT and PE, how patients can reduce risk of VTE, importance of seeking help if DVT, PE or other adverse event suspected
- Provide written and verbal information on:
  - importance of using VTE prophylaxis correctly (including correct administration and disposal of pharmacological VTE prophylaxis),
  - continuing treatment for recommended duration, signs and symptoms of adverse events related to VTE prophylaxis,
  - importance of seeking help if patients have problems with VTE prophylaxis
  - How patients can reduce risk of VTE (e.g. keeping hydrated, exercising, keeping mobile)
  - Be aware that heparins are of animal origin, which may be of concern to some people. Discuss alternative agents with patients who have concerns

As part of the discharge plan:

For patients discharged on anti-embolism stockings (AES):

- Understand the benefit of wearing AES, including wearing them correctly, removing them daily for hygiene purposes, are able to remove/replace them/have carer to do this for them/know who to contact if there is a problem/know when to stop wearing them
- Ensure that patients discharged on both pharmacological and AES are able to use them correctly.

Continuity of care across the primary-secondary care interface:

- ***GP to be informed if being discharged on VTE prophylaxis including anti-embolism stockings, supply full course, including sharps bins, info on how to dispose of used injections.***
- ***Need to inform other HCPS e.g. district nurses if patients require on-going support in administration of injections***

## Patient information

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- **Ensure patients understand:**
  - why they are having a risk assessment
  - The risks and benefits of prophylaxis prior to initiating
  - On discharge signs and symptoms, reducing own risk, how to use prophylaxis, **who to speak to if problems**
- **To consider**
  - Who will discuss this and how will this be discussed? Time constraints?
  - Who will be point of contact?
  - VTE nurse, ward nurse, ward doctor, ward pharmacist?

## Summary

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- Hospital acquired VTE is one of our most important patient safety issues
- Relies on strong clinical governance and leadership
- Striving for continuous improvement
- All of the MDT play key role in this continuous process
  - Supporting the prescribing role: guidelines
  - Regular audit
  - Reporting outcomes (internal and external)
  - Comprehensive education and training programme
  - Effective communication to staff, patients and hospital patient groups about VTE prevention
  - Patient information
  - VTE champions

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**Thank you**

**[www.guysandstthomas.nhs.uk](http://www.guysandstthomas.nhs.uk)**

**[www.kingshealthpartners.org](http://www.kingshealthpartners.org)**