

# Reducing venous thromboembolism risk: orthopaedic surgery

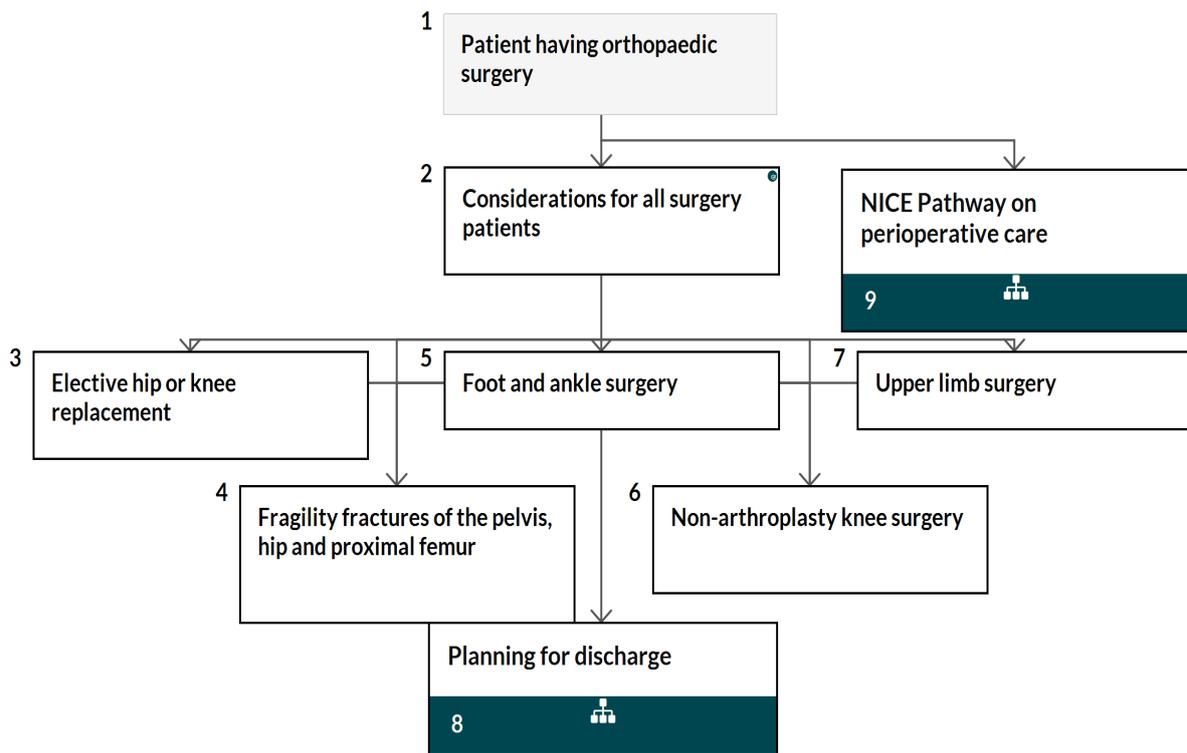
NICE Pathways bring together everything NICE says on a topic in an interactive flowchart. NICE Pathways are interactive and designed to be used online.

They are updated regularly as new NICE guidance is published. To view the latest version of this NICE Pathway see:

<http://pathways.nice.org.uk/pathways/venous-thromboembolism>

NICE Pathway last updated: 25 August 2021

This document contains a single flowchart and uses numbering to link the boxes to the associated recommendations.



## 1 Patient having orthopaedic surgery

No additional information

## 2 Considerations for all surgery patients

Consider regional anaesthesia for individual patients, in addition to other methods of VTE prophylaxis, as it carries a lower risk of VTE than general anaesthesia. Take into account the person's preferences, their suitability for regional anaesthesia and any other planned method of VTE prophylaxis.

If regional anaesthesia is used, plan the timing of pharmacological VTE prophylaxis to minimise the risk of epidural haematoma. If antiplatelet or anticoagulant agents are being used, or their use is planned, refer to the summary of product characteristics for guidance about the safety and timing of these in relation to the use of regional anaesthesia.

Do not routinely offer pharmacological or mechanical VTE prophylaxis to people undergoing a surgical procedure with local anaesthesia by local infiltration with no limitation of mobility.

For pharmacological VTE prophylaxis in people under 18, follow the recommendations on apixaban, aspirin, dabigatran etexilate, fondaparinux sodium, LMWH and rivaroxaban in this guidance. In March 2018, the use of these drugs in young people under 18 was off label. See [prescribing medicines at NICE website](#).

If using pharmacological VTE prophylaxis for surgical and trauma patients, start it as soon as possible and within 14 hours of admission, unless otherwise stated in the population-specific recommendations.

### Quality standards

The following quality statement is relevant to this part of the interactive flowchart.

1. Timing of pharmacological venous thromboembolism prophylaxis

### 3 Elective hip or knee replacement

#### Elective hip replacement

Offer VTE prophylaxis to people undergoing elective hip replacement surgery whose risk of VTE outweighs their risk of bleeding. Choose any one of:

- LMWH (for 10 days) followed by aspirin (75 or 150 mg) for a further 28 days.
- LMWH (for 28 days) combined with anti-embolism stockings (until discharge).
- Rivaroxaban (see below).

Consider apixaban or dabigatran etexilate if none of the options above can be used. For further information, see sections on apixaban and dabigatran etexilate below.

In March 2018:

- the use of LMWH and rivaroxaban in young people under 18 as described in the recommendation above was off label
- the use of aspirin as described in the recommendation above was off label
- the use of apixaban and dabigatran etexilate in young people under 18 as described in the recommendation above was off label.

See [prescribing medicines at NICE website](#).

Consider anti-embolism stockings until discharge from hospital if pharmacological interventions are contraindicated in people undergoing elective hip replacement surgery.

#### Elective knee replacement

Offer VTE prophylaxis to people undergoing elective knee replacement surgery whose VTE risk outweighs their risk of bleeding. Choose any one of:

- Aspirin (75 or 150 mg) for 14 days.
- LMWH (for 14 days) combined with anti-embolism stockings (until discharge).
- Rivaroxaban (see below).

Consider apixaban or dabigatran etexilate if none of the options above can be used. For further information, see sections on apixaban and dabigatran etexilate below.

In March 2018:

- the use of LMWH and rivaroxaban in young people under 18 as described in the recommendation above was off label
- the use of aspirin as described in the recommendation above was off label
- the use of apixaban and dabigatran etexilate in young people under 18 as described in the recommendation above was off label.

See [prescribing medicines at NICE website](#).

Consider [intermittent pneumatic compression \[See page 8\]](#) if pharmacological prophylaxis is contraindicated in people undergoing elective knee replacement surgery. Continue until the person is mobile.

### **Apixaban**

The following recommendation is from [NICE technology appraisal guidance on apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults](#).

Apixaban is recommended as an option for the prevention of venous thromboembolism in adults after elective hip or knee replacement surgery.

NICE has written [information for the public on apixaban](#).

### **Rivaroxaban**

The following recommendation is from [NICE technology appraisal guidance on rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults](#).

Rivaroxaban, within its marketing authorisation, is recommended as an option for the prevention of venous thromboembolism in adults having elective total hip replacement or elective total knee replacement surgery.

NICE has written [information for the public on rivaroxaban](#).

### **Dabigatran etexilate**

The following recommendation is from [NICE technology appraisal guidance on dabigatran etexilate for the prevention of venous thromboembolism after hip or knee surgery in adults](#).

Dabigatran etexilate, within its marketing authorisation, is recommended as an option for the primary prevention of venous thromboembolic events in adults who have undergone elective total hip replacement surgery or elective total knee replacement surgery.

NICE has written [information for the public on dabigatran](#).

## 4 Fragility fractures of the pelvis, hip and proximal femur

Offer VTE prophylaxis for a month to people with fragility fractures of the pelvis, hip or proximal femur if the risk of VTE outweighs the risk of bleeding. Choose either:

- LMWH, starting 6 to 12 hours after surgery **or**
- fondaparinux sodium, starting 6 hours after surgery, providing there is low risk of bleeding.

Consider pre-operative VTE prophylaxis for people with fragility fractures of the pelvis, hip or proximal femur if surgery is delayed beyond the day after admission. operative VTE prophylaxis for people with fragility fractures of the pelvis, hip or proximal femur if surgery is delayed beyond the day after admission. Give the last dose no less than 12 hours before surgery for LMWH or 24 hours before surgery for fondaparinux sodium.

In March 2018, the use of LMWH and fondaparinux sodium in young people under 18 as described in the recommendations above was off label. See [prescribing medicines at NICE website](#).

Consider [intermittent pneumatic compression \[See page 8\]](#) for people with fragility fractures of the pelvis, hip or proximal femur at the time of admission if pharmacological prophylaxis is contraindicated. Continue until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

See [the NICE Pathways on osteoporosis](#) and [hip fracture](#).

## 5 Foot and ankle surgery

Consider pharmacological VTE prophylaxis for people undergoing foot or ankle surgery:

- that requires immobilisation (for example, arthrodesis or arthroplasty); consider stopping prophylaxis if immobilisation continues beyond 42 days (see [lower limb immobilisation](#)) **or**
- when total anaesthesia time is more than 90 minutes **or**
- the person's risk of VTE outweighs their risk of bleeding.

## 6 Non-arthroplasty knee surgery

Be aware that VTE prophylaxis is generally not needed for people undergoing arthroscopic knee surgery where:

- total anaesthesia time is less than 90 minutes **and**
- the person is at low risk of VTE.

Consider LMWH 6 to 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.

In March 2018, the use of LMWH in young people under 18 was off label. See [prescribing medicines at NICE website](#).

Consider VTE prophylaxis for people undergoing other knee surgery (for example, osteotomy or fracture surgery) whose risk of VTE outweighs their risk of bleeding.

## 7 Upper limb surgery

Be aware that VTE prophylaxis is generally not needed if giving local or regional anaesthetic for upper limb surgery.

Consider VTE prophylaxis for people undergoing upper limb surgery if the person's total time under general anaesthetic is over 90 minutes or where their operation is likely to make it difficult for them to mobilise.

## 8 Planning for discharge

See [Venous thromboembolism/reducing venous thromboembolism risk in hospital patients /Planning for discharge](#)

## 9 NICE Pathway on perioperative care

See [Perioperative care](#)

## Intermittent pneumatic compression

A method of prophylaxis that includes an air pump and inflatable garments in a system designed to improve venous circulation in the lower limbs of people at risk of deep vein thrombosis or pulmonary embolism. The inflation-deflation cycle of intermittent pneumatic compression therapy simulates the thigh, calf and foot's normal ambulatory pump action increasing both the volume and rate of blood flow, eliminating venous stasis and replicating the effects of the natural muscle pump. Intermittent pneumatic compression devices can be thigh or knee length sleeves that are wrapped around the leg, or a garment that can be wrapped around or worn on the foot that is designed to mimic the actions of walking.

## Glossary

### Discharge

(in this guidance, 'discharge' refers to discharge from hospital as an inpatient or after a day procedure)

### LMWH

low molecular weight heparin

### VTE

venous thromboembolism

## Sources

[Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism](#) (2018) NICE guideline NG89

[Apixaban for the prevention of venous thromboembolism after total hip or knee replacement in adults](#) (2012) NICE technology appraisal guidance 245

[Rivaroxaban for the prevention of venous thromboembolism after total hip or total knee replacement in adults](#) (2009) NICE technology appraisal guidance 170

[Dabigatran etexilate for the prevention of venous thromboembolism after hip or knee replacement surgery in adults](#) (2008) NICE technology appraisal guidance 157

## Your responsibility

### Guidelines

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

### Technology appraisals

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, health professionals are expected to take these recommendations fully into account, alongside the individual needs, preferences and values of their patients. The application of the recommendations in this interactive flowchart is at the discretion of health professionals and their individual patients and do not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Commissioners and/or providers have a responsibility to provide the funding required to enable the recommendations to be applied when individual health professionals and their patients wish to use it, in accordance with the NHS Constitution. They should do so in light of their duties to

have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

### **Medical technologies guidance, diagnostics guidance and interventional procedures guidance**

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take these recommendations fully into account. However, the interactive flowchart does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Commissioners and/or providers have a responsibility to implement the recommendations, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this interactive flowchart should be interpreted in a way that would be inconsistent with compliance with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.