

Deep Vein Thrombosis in Primary Care: A Narrative Review with a Clinical Case Scenario

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Abstract

Review Article

Deep vein thrombosis (DVT) is a common and potentially life-threatening manifestation of venous thromboembolism that frequently presents first in primary care. Prompt recognition is challenging because symptoms such as unilateral leg pain, swelling, warmth, and tenderness are nonspecific and may resemble several musculoskeletal, inflammatory, and vascular conditions. This review discusses the epidemiology, pathophysiology, risk factors, clinical presentation, diagnosis, treatment, and long-term management of DVT from a primary-care perspective. A clinical case illustrates the application of the two-level Wells score, D-dimer testing, and proximal leg-vein ultrasonography in accordance with current guidance. When indicated imaging cannot be completed promptly, interim therapeutic anticoagulation is essential to reduce the risk of pulmonary embolism and other complications. Direct oral anticoagulants, particularly apixaban and rivaroxaban, are suitable first-line treatments for most adults, although renal function, bleeding risk, pregnancy, malignancy, drug interactions, and patient preference must be considered. Anticoagulation should generally continue for at least three months, with further treatment individualised according to whether the event was provoked or unprovoked and the balance between recurrence and bleeding risks. Primary care also has a central role in monitoring adherence, recognising complications, providing patient education, and reviewing the need for extended anticoagulation. A structured, probability-based diagnostic approach, timely referral, appropriate interim treatment, and planned long-term follow-up can substantially improve outcomes for patients with suspected or confirmed DVT.

Keywords: deep vein thrombosis; venous thromboembolism; primary care; Wells score; D-dimer; anticoagulation; direct oral anticoagulants.

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INTRODUCTION

Deep vein thrombosis (DVT) is the formation of a thrombus within the deep venous system, most commonly in a lower limb. It is part of the broader spectrum of venous thromboembolism (VTE), which also includes pulmonary embolism (PE). DVT remains a challenging diagnosis in everyday practice because its symptoms are often nonspecific, risk factors may accumulate gradually, and serious complications can develop before the diagnosis is confirmed. In general practice, DVT is important for three reasons: an untreated clot may embolise to the pulmonary circulation; recurrence, anticoagulant-related complications, and post-thrombotic syndrome can cause substantial long-term morbidity; and the first decision point often occurs outside hospital. Primary care clinicians must therefore combine probability-based assessment with urgent escalation. Early recognition and prompt referral are fundamental to safe care (Chopard *et*

al., 2020; National Institute for Health and Care Excellence [NICE], 2020).

Scope and Approach

This narrative review synthesises current clinical guidance and selected peer-reviewed evidence relevant to the recognition, diagnosis, treatment, and follow-up of DVT in primary care. It emphasises practical decision-making for non-pregnant adults and uses an illustrative clinical case to connect the evidence with routine general-practice assessment.

Clinical Case Scenario

A 52-year-old woman presents to general practice with a 3-day history of left calf pain and swelling. The pain is described as a tight, aching sensation, worse on walking. There is no history of trauma. Swelling has increased over the past 24 hours. She reports a recent 8-hour long-haul flight one week ago. She denies chest pain, shortness of breath or

haemoptysis. Her past medical history includes hypertension, and her body mass index (BMI) is 31 kg/m². She is a non-smoker and has a sedentary occupation. There is no personal or family history of venous thromboembolism, and she is not taking hormonal therapy. She is concerned about this sudden painful swelling with no previous history of musculoskeletal issues and wants to know the cause of her symptoms.

Epidemiology and clinical burden

DVT is common. Estimates vary by age and case definition, but the annual incidence of first VTE is approximately 1 per 1,000 adults and rises steeply with age (Allen & Wilkinson, 2020; Khan *et al.*, 2021).

The burden of disease extends beyond the index event. A substantial minority of patients present with concomitant or occult PE, recurrence risk persists after treatment, and chronic venous symptoms can continue long after the acute clot has resolved. The practical importance of this is that management should never be viewed as ending at the point anticoagulation is started. Instead, DVT should be considered as an event with acute, medium-term, and long-term consequences, each of which may re-enter primary care.

From a service perspective, DVT also carries opportunity cost. Rapid-access imaging, anticoagulant review, cancer investigation in selected patients with unprovoked events, and the management of bleeding or recurrent symptoms all generate substantial healthcare utilization. For primary care, the most important epidemiological lesson is not merely that DVT is common, but that missed or delayed diagnosis is common enough to warrant constant vigilance when evaluating unilateral leg symptoms.

Pathophysiology and its clinical relevance

Virchow's triad venous stasis, endothelial injury, and hypercoagulability remains a useful framework for understanding DVT and structuring the clinical history. Venous stasis helps explain the risk associated with immobility, plaster casts, hospital admission, heart failure, and long-haul travel. Endothelial injury is relevant after surgery, trauma, central venous instrumentation, and inflammatory vascular states. Hypercoagulability includes inherited thrombophilias, malignancy, pregnancy, exogenous oestrogen exposure, and acute or chronic inflammatory conditions (Khan *et al.*, 2021).

Contemporary evidence expands rather than replaces this model. Inflammation, cancer biology, age-related comorbidity, nephrotic syndrome, and myeloproliferative disease contribute to one or more components of Virchow's triad. For the GP, the practical implication is that risk is cumulative: many patients have several moderate risks rather than one dramatic factor,

such as older age, obesity, reduced mobility, recent infection, and hormone therapy (Khan *et al.*, 2021).

Risk factors and provoking factors

Important risk factors include previous VTE, active cancer, obesity, increasing age, immobility, surgery, pregnancy and the puerperium, thrombophilia, heart failure, smoking, and exposure to oestrogen-containing therapy (Allen & Wilkinson, 2020; NICE, 2025).

Transient and Persistent Provoking Factors

From a management perspective, it is often more useful to separate risks into transient provoking factors and persistent or ongoing factors. A transient provoking factor is one that can plausibly explain the event and has since resolved or is expected to resolve, such as major surgery, lower-limb immobilization, trauma, or an acute period of immobility. Persistent factors include active malignancy, chronic inflammatory disease, severe thrombophilia, or another enduring prothrombotic state. This distinction matters because it informs decisions about how long anticoagulation should continue.

Pregnancy and the Puerperium

Pregnancy requires separate consideration. NICE guideline NG158 does not cover pregnant women, and the Wells pathway used for non-pregnant adults should not be transferred directly to pregnancy or the puerperium. Suspected DVT in this group requires same-day specialist assessment (NICE, 2020).

Although textbook risk factor lists are helpful, they can become mechanically applied. A stronger primary care habit is to ask: what has changed for this patient in the last 12 weeks, and what has not changed? Recent surgery, infection, hospitalization, reduced mobility, new cancer therapy, hormonal treatment, and long-distance travel all matter. So too does a history of prior unprovoked VTE, because recurrence risk shapes long-term decision-making even after the acute episode is treated.

Clinical presentation and differential diagnosis

DVT usually presents with unilateral leg symptoms. Pain, tenderness, swelling, warmth, erythema, and increased calf circumference are classical features, but no single symptom or sign can reliably diagnose or exclude DVT. Because DVT and PE may coexist, clinicians should ask specifically about chest pain, dyspnoea, haemoptysis, syncope, and hypoxia (Allen & Wilkinson, 2020; Chopard *et al.*, 2020).

Differential Diagnosis

The most common pitfall in general practice is anchoring too early on a benign explanation for unilateral leg symptoms. Cellulitis, superficial thrombophlebitis, ruptured Baker's cyst, chronic venous insufficiency, lymphoedema, muscle injury, and joint pathology can all

mimic DVT. However, the opposite mistake is also possible: overcalling DVT in every painful leg. The purpose of formal probability assessment is to avoid both errors.

Superficial thrombophlebitis deserves particular care. It may be clinically obvious, especially where varicose veins are present, but proximity to the deep system can be important and some patients require ultrasound to define the extent of disease. Likewise, post-thrombotic syndrome can complicate later assessment because chronic swelling, skin change, or pain may resemble recurrent DVT. Previous records and imaging

history are therefore valuable when evaluating recurrent symptoms.

Diagnostic strategy in primary care

Clinical Probability Assessment: The Wells Score

The two-level Wells score is the standard initial clinical-probability tool for suspected lower-limb DVT in non-pregnant adults. It estimates pretest probability rather than establishing a diagnosis. A score of 2 points or more indicates that DVT is likely, whereas a score of 1 point or less indicates that DVT is unlikely. The score should support, not replace, clinical judgement (Geersing *et al.*, 2014; NICE, 2020).

Table 1: Two-level Wells score for suspected DVT in adults

Clinical feature	Score
Active cancer (treatment ongoing, within 6 months, or palliative)	+1
Paralysis, paresis, or recent plaster immobilisation of a lower extremity	+1
Recently bedridden for more than 3 days, or major surgery within the previous 12 weeks requiring general or regional anaesthesia	+1
Localized tenderness along distribution of deep venous system	+1
Entire leg swollen	+1
Calf swelling >3 cm compared with asymptomatic leg (measured 10 cm below tibial tuberosity)	+1
Pitting oedema confined to the symptomatic leg	+1
Collateral superficial veins (non-varicose)	+1
Previously documented DVT	+1
Alternative diagnosis at least as likely as DVT	-2

Interpretation. A score of 2 or more means DVT is likely; a score of 1 or less means DVT is unlikely. The score should not be used in pregnancy and should not override strong clinical concern (NICE, 2020; Wells *et al.*, 1997). Note. Adapted from Wells *et al.*, (1997).

D-Dimer Testing and Ultrasonography

NICE (2020) recommends the following pathway for adults. If DVT is likely, arrange proximal leg-vein ultrasound within 4 hours. If the result is negative, obtain a D-dimer test; if the D-dimer result is positive, repeat proximal leg-vein ultrasound 6–8 days later. If immediate imaging is unavailable, give interim therapeutic anticoagulation and arrange ultrasound within 24 hours. If DVT is unlikely, obtain a D-dimer test first. A positive result leads to ultrasound, whereas a negative result generally excludes DVT without imaging.

Timely Diagnosis and Safety-Netting

For GPs, the most important operational principle is speed. The guideline is designed to shorten the time between first suspicion and protected diagnosis. It does not ask primary care to hold uncertainty passively. Instead, it asks clinicians to classify probability, order the next test promptly, and start interim treatment when delay would expose the patient to avoidable harm.

Recent evidence reinforces the importance of avoiding diagnostic delay. In a 2025 diagnostic study of 3,525 patients with VTE-related symptoms documented in primary care, diagnosis more than 24 hours after

presentation was common in two health systems. At one institution, 30-day all-cause mortality was 2.52% among patients diagnosed within 24 hours and 8.33% among those diagnosed later; practitioner-related delays were the most frequent type of missed opportunity (Kang *et al.*, 2025). Because the study included both DVT and PE, its findings should not be interpreted as DVT-specific, but they remain relevant to timely VTE assessment in primary care.

Clinicians should also understand the limitations of D-dimer. It is highly sensitive but not specific. Levels may rise with age, infection, inflammation, malignancy, trauma, pregnancy, recent surgery, and hospitalisation. A positive D-dimer does not diagnose DVT; it signals the need for imaging in a patient whose pre-test probability is low enough for D-dimer to be useful. Conversely, once a patient has already received heparin or another anticoagulant, interpretation may be more difficult, which is why the test is ideally performed before interim treatment when feasible.

The Wells score is most useful in outpatient DVT assessment when combined with D-dimer testing and selective imaging. It should not be used as a stand-alone test, and its performance is less reliable in inpatients and some clinically important subgroups. Inpatients with suspected DVT generally require direct assessment with compression ultrasonography according to the relevant local or specialist pathway (Geersing *et al.*, 2014; Silveira *et al.*, 2018).

Figure 1. Overview of DVT Treatment

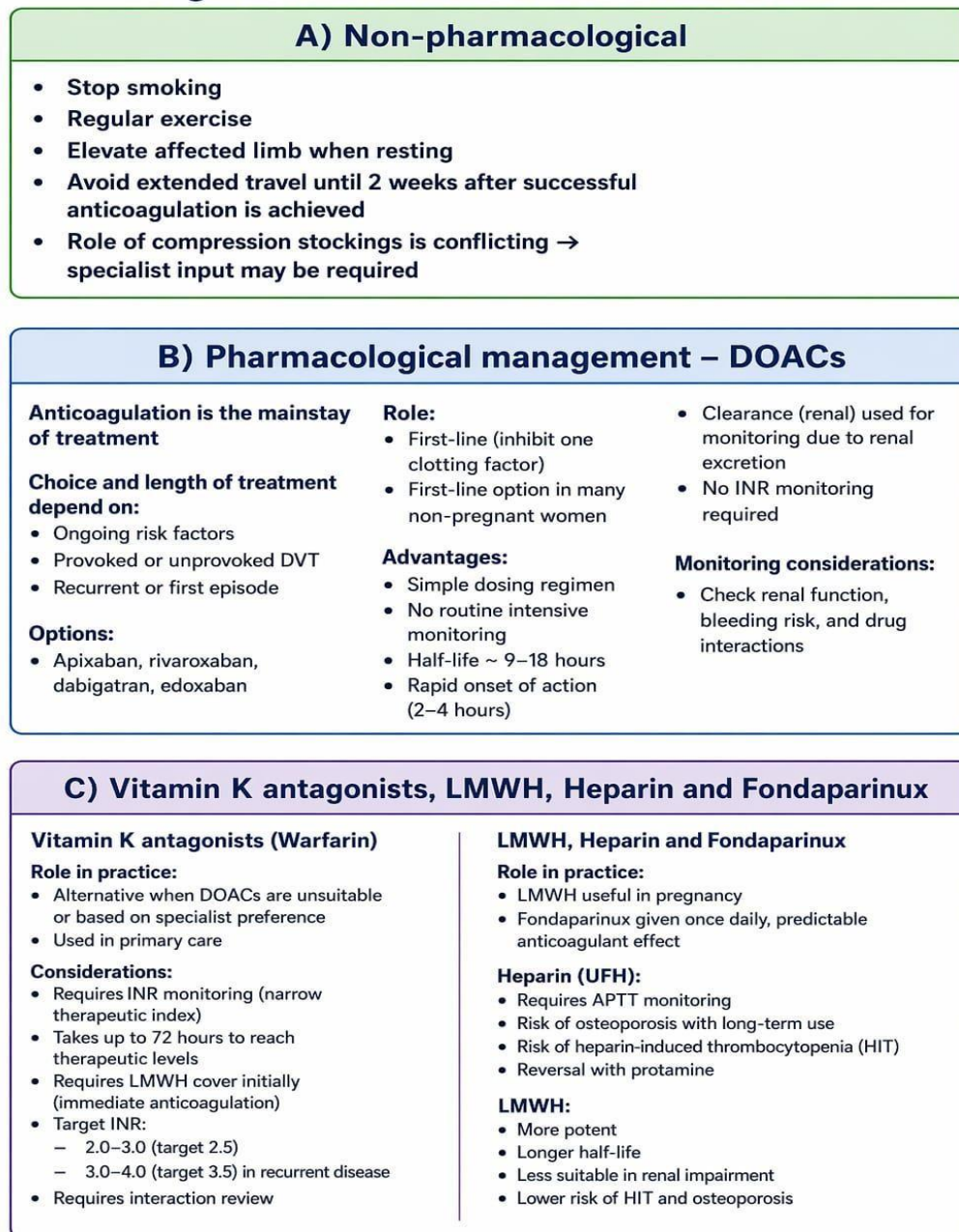


Figure 1: Overview of DVT treatment and pharmacological management

Initial treatment and the role of DOACs

Initial Anticoagulant Selection

Anticoagulation is the mainstay of treatment. For most adults with confirmed proximal DVT or PE, NICE recommends apixaban or rivaroxaban as first-line options when suitable. If neither is appropriate, alternatives include low-molecular-weight heparin (LMWH) followed by dabigatran or edoxaban, or LMWH given concurrently with a vitamin K antagonist such as warfarin. Interim therapeutic anticoagulation is also recommended when indicated diagnostic testing cannot be completed within the specified time (NICE, 2020).

This DOAC-first approach reflects practical and pharmacological advantages. DOACs have rapid onset, fixed-dose regimens, fewer food interactions, and no requirement for INR monitoring. These features are particularly valuable in primary care because they reduce the complexity of treatment initiation and ongoing monitoring, although they do not remove the need for medication review, renal function assessment, counseling, and adherence checks.

Current evidence and guidelines support direct oral anticoagulants (DOACs) as first-line therapy for most adults with lower-extremity DVT, with important exceptions and cautions including pregnancy, severe

renal impairment, clinically significant drug interactions, and selected cancer-associated thrombosis (Khan *et al.*, 2021; NICE, 2020).

Safe Prescribing and Monitoring

DOAC prescribing in primary care still requires careful attention to body weight where relevant, renal

function, bleeding history, drug interactions, hepatic disease, and the indication for full-dose versus extended-dose treatment. Patients also need specific safety advice about missed doses, planned procedures, over-the-counter medicines, and what to do if bleeding occurs.

Figure 2. Diagnostic pathway for suspected lower-limb deep vein thrombosis in primary care (adapted from NICE Guideline NG158)

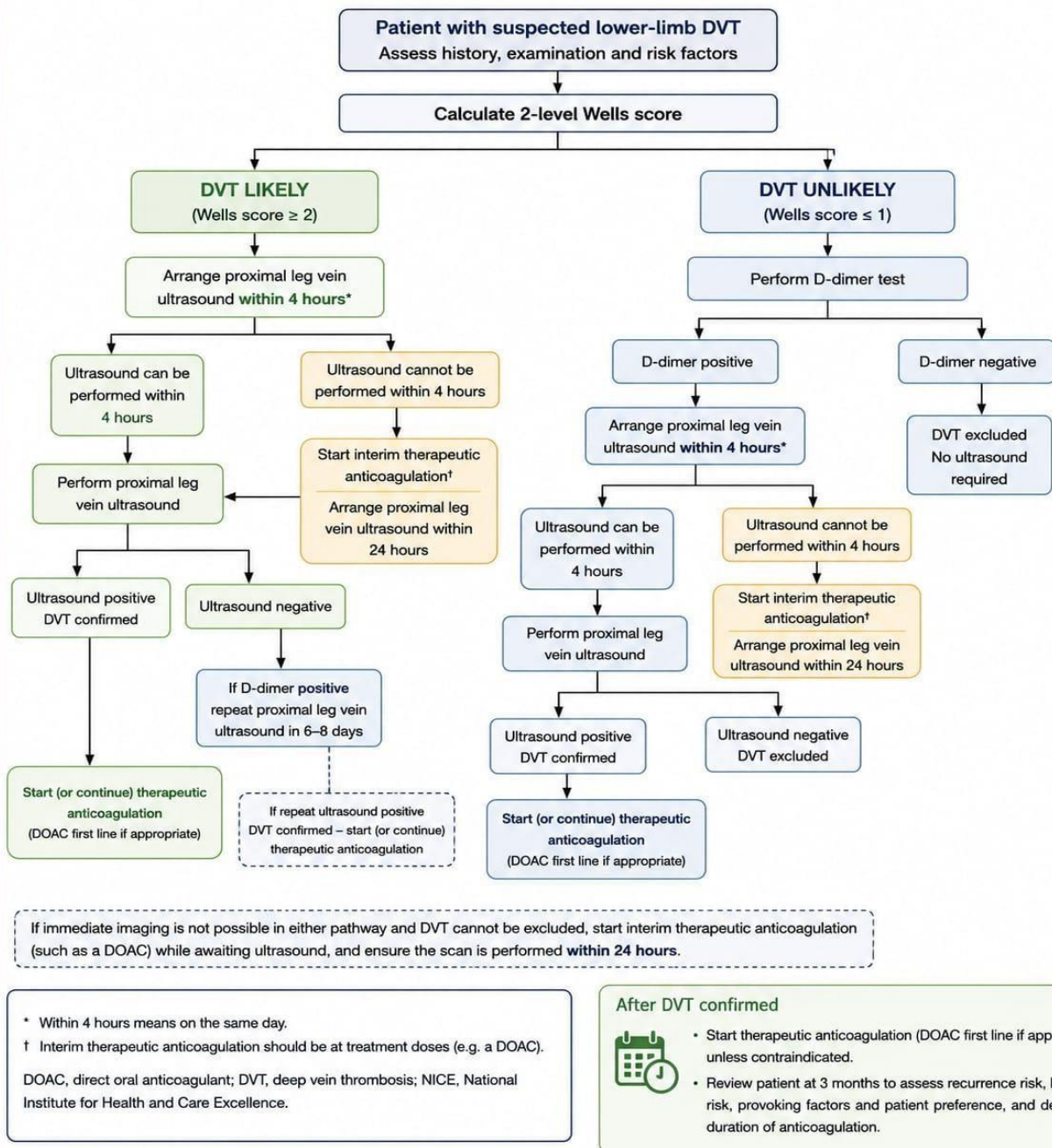


Figure 1: Diagnostic pathway for suspected lower-limb DVT in primary care (adapted from NICE Guideline NG158)

Duration of anticoagulation and extended treatment

Every patient with confirmed proximal DVT or PE should receive at least 3 months of anticoagulation unless the risks clearly outweigh the benefits. At review,

the decision to continue beyond 3 months should balance recurrence risk against bleeding risk and consider provoking factors, cancer status, comorbidity, and

patient preference. Shared decision-making is essential (NICE, 2020).

Provoked and Unprovoked DVT

A useful starting point is to separate events into provoked and unprovoked. A DVT provoked by a major transient factor, such as surgery or a lower-limb cast, often justifies stopping after 3 months if the provoking factor has resolved and the patient's recurrence risk is low. By contrast, unprovoked DVT, cancer associated thrombosis, recurrent VTE, or persistent prothrombotic conditions all raise the threshold for stopping.

Reduced-Dose Strategies for Extended Treatment

Recent studies have examined reduced-dose versus full-dose DOACs during extended treatment. A 2025 meta-analysis found reduced-dose regimens associated with comparable efficacy and less bleeding across the included randomised trials (Ahmed *et al.*, 2025). However, the RENOVE trial in patients at high risk of recurrence did not meet its prespecified non-inferiority criterion, although absolute recurrence rates were low and clinically relevant bleeding was less frequent with reduced doses (Couturaud *et al.*, 2025). Dose selection must therefore be individualised rather than applied routinely.

Primary care reviews at 3 months should therefore cover four points explicitly: the nature of the provoking factor, whether the event was first or recurrent, bleeding risk, and patient values. Some patients fear recurrence more than bleeding; others are strongly risk-averse about continued anticoagulation. Shared decision-making is therefore essential.

Special situations

Pregnancy

Pregnancy should be managed outside the standard adult pathway because NICE guideline NG158 does not cover pregnant women. Suspected DVT in pregnancy requires same-day specialist assessment, and LMWH is generally the anticoagulant of choice when treatment is required. Warfarin and DOACs are generally avoided during pregnancy (NICE, 2020).

Cancer-Associated Thrombosis

Cancer-associated thrombosis has evolved from an LMWH-dominated field towards broader, selective DOAC use. Anticoagulant choice should account for tumour site, gastrointestinal or genitourinary bleeding risk, renal function, drug interactions, and the patient's anticancer regimen. Primary care should follow oncology or specialist protocols rather than assume that all patients with malignancy share one treatment pathway (Khan *et al.*, 2021; NICE, 2020).

Renal Impairment and Other High-Risk Groups

Renal impairment deserves particular caution because all DOACs rely to some extent on renal clearance. Reduced renal function may increase drug

exposure and bleeding risk. Warfarin or adjusted LMWH may be preferred in selected cases. The practical primary care point is straightforward: do not treat renal function as an afterthought. Check it before prescribing, and re-check it when clinical status changes.

Other groups that warrant extra care include frail older adults, patients with recurrent falls, those with liver disease, and patients taking interacting drugs.

Distal DVT

Isolated distal (calf) DVT generally has a lower embolic risk than proximal DVT, but some patients remain at risk of thrombus extension. Management should be individualised according to symptom burden, risk factors for extension, bleeding risk, and follow-up ultrasound findings, with specialist or local-pathway input where appropriate (Chopard *et al.*, 2020).

Compression stockings, thrombolysis, and other adjuncts

The role of compression stockings has changed. NICE does not recommend routine elastic graduated compression stockings solely to prevent post-thrombotic syndrome or VTE recurrence after proximal DVT. This position is consistent with uncertainty demonstrated in later trials, including the placebo-controlled SOX trial (Kahn *et al.*, 2014; NICE, 2020).

Compression may nevertheless relieve acute symptoms in selected patients. A structured review concluded that compression therapy can reduce pain and swelling and may reduce the frequency and severity of post-thrombotic syndrome, although treatment should be tailored to the individual (Thieme *et al.*, 2024). Thus, selective symptom-led use should be distinguished from routine prescription for all patients.

Thrombolysis has a limited role and is reserved for selected situations rather than routine lower-limb DVT. NICE advises considering catheter-directed thrombolysis for symptomatic iliofemoral DVT in carefully selected patients with symptoms lasting less than 14 days, good functional status, a life expectancy of at least 1 year, and low bleeding risk. Inferior vena cava filters are not standard treatment and are generally reserved for specific circumstances in which anticoagulation is contraindicated or PE occurs despite anticoagulation (NICE, 2020).

Cancer investigation and thrombophilia testing

Thrombophilia Testing

Once DVT is confirmed, the question of underlying cause becomes important. NICE advises against indiscriminate thrombophilia testing. Instead, testing should be selective and clinically justified. In general, if a patient has had a provoked event and there is no plan to stop anticoagulation, thrombophilia testing is unlikely to alter management. Testing becomes more relevant in unprovoked events when decisions about

stopping anticoagulation are being made, especially where there is a strong family history.

Investigation for Occult Cancer

Investigation for occult cancer should also be proportionate. For an unprovoked DVT or PE, NICE recommends reviewing the medical history, conducting a physical examination, and considering baseline blood tests. Further cancer investigations are not recommended unless relevant symptoms or signs are present (NICE, 2020).

Long-term complications and follow-up in primary care

Post-Thrombotic Syndrome

Post-thrombotic syndrome remains one of the most important long-term sequelae of DVT. Patients may develop chronic pain, swelling, heaviness, skin pigmentation, venous eczema, lipodermatosclerosis, or ulceration. These symptoms reduce mobility and quality of life, and they may persist despite technically successful treatment of the acute clot.

Risk of Recurrence

Recurrence is another major issue. Patients who have had one DVT remain at higher risk of another, particularly if the initial event was unprovoked, cancer-associated, or associated with a persistent prothrombotic state. Follow-up should therefore not be limited to medication duration; it should include discussion of future-risk situations such as surgery, hospital admission, prolonged immobility, and travel.

Primary Care Follow-Up

Primary care also holds the continuity needed to identify bleeding problems, dosing confusion, and adherence drift. Good follow-up therefore means clearly recording why anticoagulation was started, when it should be reviewed, and what factors would favour continuation or stopping.

Psychosocial and educational aspects

The psychosocial consequences of DVT are easily overlooked. Anxiety about recurrence, bleeding, travel, exercise, and treatment duration may persist after the acute episode. Uncertainty often resurfaces at the 3-month review, particularly when patients are asked to choose between stopping and continuing anticoagulation.

Patient Education and Shared Decision-Making

Patient education should therefore extend beyond a short warning about bleeding. Key points include the symptoms of PE that require urgent attention; the importance of adherence, particularly because DOACs have relatively short half-lives; avoiding dehydration and prolonged immobility; what to do about missed doses; and who to contact before procedures or when new medicines are prescribed.

Patients also benefit from clear explanations of why their treatment duration may differ from someone else's. A person with a calf DVT after surgery may rightly stop at 3 months, while another with an unprovoked proximal DVT may continue longer. Explaining the rationale improves trust and adherence.

Implications for general practice

For general practitioners, the modern DVT pathway can be summarized in three linked responsibilities. The first is recognition: think of DVT early enough for the pathway to be activated. The second is protection: do not allow a patient with likely DVT to remain untreated while waiting for imaging if the scan cannot be arranged quickly. The third is stewardship: ensure anticoagulation is monitored, reviewed, and individualized rather than left on autopilot.

The diagnostic-delay literature is particularly instructive because it frames VTE not only as a biological disease but also as a systems and decision-making challenge. Practitioner-related delays identified by Kang *et al.*, (2025) suggest opportunities for quality improvement through stronger safety-netting, easier access to urgent imaging pathways, and greater awareness of nonspecific VTE presentations.

CONCLUSION

Overall, DVT management in 2026 is both simpler and more nuanced than it was previously. It is simpler because DOACs and clear NICE pathways reduce unnecessary complexity. It is more nuanced because long-term treatment, extended-dose strategies, selected compression use, and investigation of underlying causes all require individual judgment.

Clinical Case Resolution

Returning to the clinical case, the patient has a Wells score of 2 (DVT likely), based on localised tenderness along the deep venous system and calf swelling of more than 3 cm, assuming these findings are confirmed on examination and no alternative diagnosis is at least as likely. In accordance with NICE (2020), proximal leg-vein ultrasound should be arranged within 4 hours. If the scan cannot be obtained within 4 hours, obtain a D-dimer result, give interim therapeutic anticoagulation, and arrange ultrasound within 24 hours. A positive ultrasound confirms proximal DVT, after which apixaban or rivaroxaban may be started if appropriate following assessment of renal function, bleeding risk, and drug interactions.

At the 3-month review, the event may be considered provoked by the recent long-haul flight, although the strength and duration of the provoking factor should be assessed clinically. Bleeding risk, recurrence risk, persistent factors, and patient preferences should be reviewed through shared decision-making. If the event is judged provoked and the

provoking factor has resolved, stopping anticoagulation after 3 months may be appropriate (NICE, 2020).

Key points

- Think of DVT early in any patient with unilateral leg pain or swelling, especially when risk factors cluster.
- Use the two-level Wells score to structure probability in non-pregnant adults, but do not let the score override strong clinical concern.
- If DVT is likely and ultrasound cannot be obtained within 4 hours, arrange interim therapeutic anticoagulation and imaging within 24 hours.
- A positive D-dimer does not diagnose DVT; it identifies low-probability patients who still need imaging.
- DOACs are first-line for most adults, but renal function, bleeding risk, interactions, and pregnancy status must always be checked.
- Every patient needs a documented review plan for anticoagulation duration.

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