Quality of Ultrasound Requests for Suspected Lower Limb Deep Vein Thrombosis: A Clinical Audit

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Introduction

NICE guidelines suspected Deep Vein Thrombosis (DVT) (NG158, 2020) recommend proximal leg ultrasound (US):

- WELLS score ≥2
- WELLS score ≤1 + raised D-dimer (>500 ng/mL).

SOR and BMUS (2023) guidelines - imaging requests should include specific clinical question and sufficient information to support suspected diagnosis.

Aim

To determine whether adequate clinical history is provided on DVT lower limb US requests.

Method

Retrospective audit of all DVT lower limb US performed at Dumfries and Galloway NHS board between 1st March 2023 – 31st May 2023. Maternity patients excluded as same-day assessment/ management is recommended (NICE, 2022).

Data obtained from US requests/ reports (RIS/PACS) and clinical portal (D-dimer results) was correlated with WELLS score criteria (Table 1).

Risk factor	Pt
Active cancer (treatment ongoing, within 6 months or palliative)	1
Paralysis, paresis or recent plaster immobilisation of lower extremities	1
Recently bedridden for 3 days or more, or major surgery within 12 weeks requiring general or regional anaesthesia.	1
Localised tenderness along the distribution of the deep venous system	1
Entire leg swollen	1
Calf swelling at least 3 cm larger than asymptomatic side	1
Pitting oedema confined to the symptomatic leg	1
Collateral superficial veins (non-varicose)	1
Previously documented DVT	1
An alternative diagnosis is at least as likely as DVT	-2

TABLE 1. DVT WELLS Score (NICE, 2020)

Results

Total audit cohort 241 US scans (238 patients).

- Positive acute DVT = 36 (15%)
- Negative acute DVT = 205 (85%)

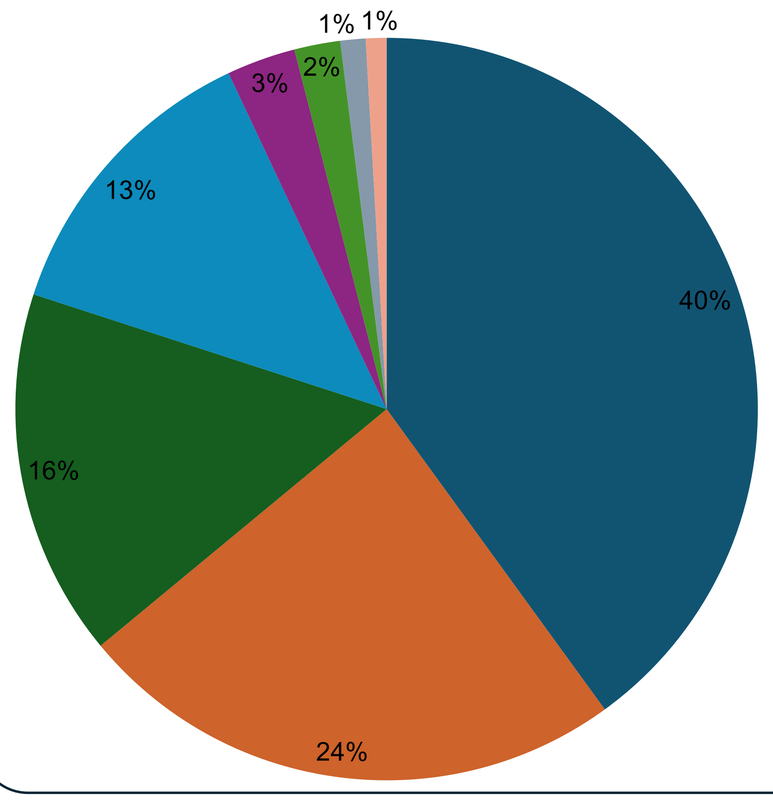
Information included on US requests

- Specific clinical question - 215 (89%)
- WELLS score - 110 (46%)
- D-dimer performed 153 (63%) – 124/153 requests (81%) included D-dimer value

Provided clinical history and WELLS score calculations

Of the included 241 US requests - 347 instances of insufficient clinical history and WELLS score miscalculations identified (Figure 1).

Figure 1. Inadequate clinical history and WELLS score errors identified on DVT US requests



- Nonspecific swelling - 138 (40%) i.e. failing to state whether whole leg swollen or calf swelling >3cm
- Nonspecific tenderness - 84 (24%) i.e. failing to state tenderness along the deep venous system
- Risk factors not stated - 54 (16%)
- Alterative diagnosis failing to deduct 2 points - 45 (13%)
- Immobility - 12 (3%) i.e. incorrectly including points for poor mobility or not specifying patient is bedbound/ bedridden >3 days
- Including points for varicose veins - 7 (2%)
- CA not specified - 4 (1%) i.e. failing to clarify cancer diagnosis is/ has been active within 6 months
- Pitting oedema (not unilateral) - 3 (1%)

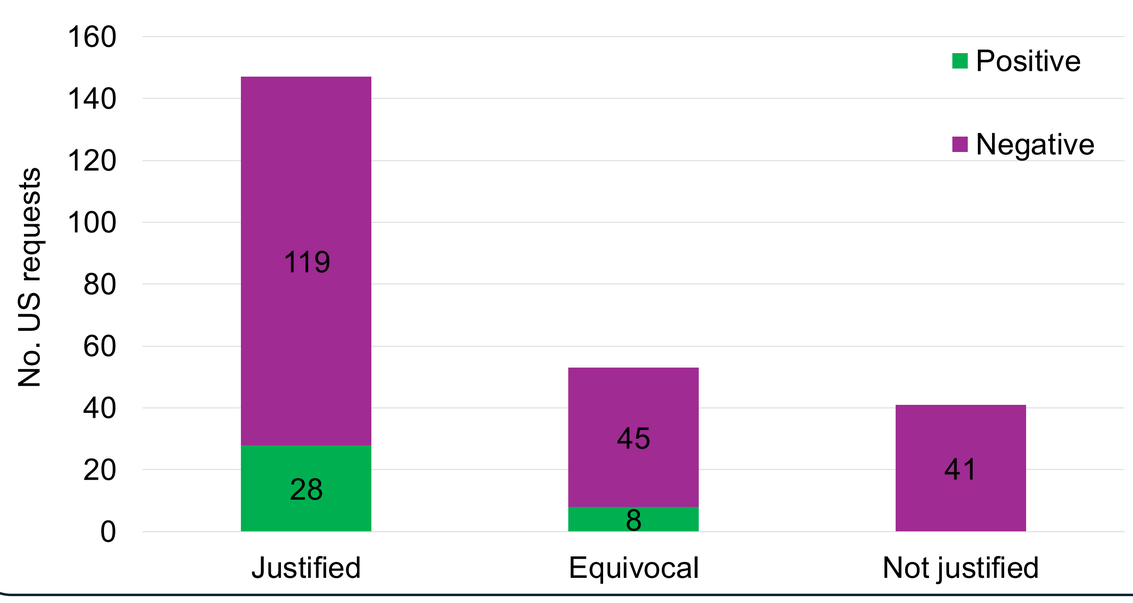
Implication on ultrasound service

Referral justification

- 147 requests (61%) justified
- 94 requests (39%) provided inadequate clinical history:
  - 53 requests (22%) equivocal
  - 41 requests (17%) not justified

Unjustified DVT US requests accounted for a loss of **13 hours 40 minutes** scanning time over a 3-month period.

Figure 2. Justification and Outcomes of DVT US Requests



Negative implications:

- Delays waiting for adequate clinical history = increased 'referral-to-scan' time - potential anxiety and delay in positive DVT diagnosis.
- Performing unnecessary scans - delays appropriate treatment/ discharge for patient, potential discomfort for patient (compression technique).
- Reduced service efficiency – potential delays for other patients waiting for US and wider hospital services.

Conclusion

Over a third (39%) of DVT US requests failed to provide adequate clinical history in accordance with NICE and BMUS guidelines. Improving US request quality would enhance patient care and improve service efficiency.

Action plan

- Standardise US request format: specific clinical question + sufficient clinical history (WELLS criteria risk factors, calculated WELLS score and D-dimer status).
- Re-education for referrers and vetting sonographers.
- Re-audit 12 months after re-education.

REFERENCE LIST