British Thoracic Society Training Standards for Thoracic Ultrasound (TUS)

2026 update

Introduction

The British Thoracic Society (BTS) published the first Training Standard in thoracic ultrasound (TUS) in 2020 [1]. This has subsequently become embedded within the specialty training curriculum for Respiratory Medicine in the UK [2] and supports training for pleural specialist nurses and other AHPs delivering respiratory care. This document represents the first full review of the Training Standard and aims to ensure it remains appropriate and accessible for contemporary respiratory practice and training.

Aim and Scope

The aim of this updated Training Standard is to provide a comprehensive framework for training and entrustment in TUS, facilitating timely and safe assessment and management of patients with respiratory disease, particularly (but not exclusively) those with pleural pathologies.

This Training Standard is predominantly intended for respiratory physicians, respiratory specialty trainees, respiratory (pleural) specialist nurses and advanced clinical practitioners working within respiratory services. The Training Standard continues to address the provision of acute or emergency pleural ultrasound (within the Emergency operator pathway) and will therefore still be relevant to providers of acute and out of hours medical care including but not exclusively, acute medical and intensive care consultants, advanced nurse practitioners and specialty trainees in general and acute medicine.

Inclusions

This document seeks to define the requirements for achieving and maintaining specific levels of capability in practice (CiPs) in TUS. The same pathway outcomes and entrustment principles should apply consistently across professional groups, while recognising the scope of practice and governance arrangements applicable to each practitioner.

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Exclusions

This Training Standard addresses capability in thoracic ultrasound. It does not define standards for pleural service provision, competence in undertaking pleural procedures, or the wider clinical management of pleural disease. Likewise TUS entrustment does not confer competence to perform a pleural procedure.

Methods

BTS agreed to review the TUS training standard through the BTS Education and Training committee. A working group to complete review of the training standard was convened. The working group was predominantly composed of respiratory physicians with expertise in pleural disease and TUS training, with representation from pleural nurse specialists and trainees. Relevant stakeholders from radiology, acute medicine and other professional groups were consulted during development of the revised standard.

The writing group met initially in early March 2026. It was agreed that the overall principles of the training standard, as published in 2020, remained appropriate, particularly with reference to the graded approach to ultrasound competency originally described (specifically the principles of the four operator pathways). It was agreed that revisions needed to focus on evidence required for entrustment at various levels within these pathways, drawing from experience of using the standard in practice and any relevant published data / survey work. Additionally, any revisions needed to align with key interval publications, specifically BTS pleural disease guideline [3] and BTS training standards for pleural procedures [4].

Definition of Capability in Practice (CiP) Level descriptors for Thoracic Ultrasound

The principles of assessing levels of capability in practice in relation to professional skills and behaviours is now firmly established in postgraduate training curricula in the UK. The global CiP level descriptors described in the original 2020 training standard remain applicable. At CiP level 3, the practitioner may perform TUS with indirect supervision. However, TUS findings must not be used to guide pleural intervention unless the examination has been reviewed by a practitioner with at least CiP Level 4 in the relevant pathway, or higher pathway. Formal entrustment decisions must be made by a practitioner with CiP Level 5 in the relevant or higher pathway. Table 1 details these level descriptors . These are unchanged from the 2020 document.

Key changes from 2020 standard

We hope some more granularity and modified annotations in the CiP tables (especially for CiP 5 requirements) will give more clarity to expectations of learners. We have

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included expected outcomes with each pathway on a single page to aid quick reference. The following will be recognized as key changes in this updated standard:

- A single Primary operator pathway, including a defined entry route for existing CiP Level 4 Emergency operators.
- Removal of mandatory or minimum examination numbers from pathway requirements (see below)
- Changes in positioning and description of some previous sonographic outcomes (e.g. capability of assessment of diaphragm function)
- More explicit evidence requirement for CiP Level 5 entrustment decisions in all pathways
- Broader options beyond DOPS for evidence provision to support entrustment within advanced and expert pathways

Individual Operator Pathways and CiP requirements

A graded approach to confirmation of TUS competency is again described with four operator pathways as follows:

- ► Emergency
- ► Primary
- ► Advanced
- ► Expert

Practitioners progress through CiP levels within each pathway as they collect evidence to support entrustment decisions ultimately to demonstrate meeting of all learning outcomes for the relevant pathway by CiP4 (figures 1-4). The pathway chosen by any individual will depend on their specific training need. Attainment of CiP level 4 within each pathway would require demonstration of having met the key specific outcomes outlined for each pathway

The Emergency Level Operator pathway is key to retain within the training standard. It provides the minimum TUS capability for clinicians who may need to identify a large, simple, free-flowing pleural effusion and select an appropriate site for urgent pleural intervention, particularly out of hours where specialty respiratory support may not be immediately available. Independent practice within this pathway is restricted to this defined clinical situation.

The Primary Operator pathway remains the standard that respiratory specialty trainees would be required to attain as part of their specialty curriculum. Currently the training curriculum specifies requirement for “Focused Pleural Ultrasound” to be performed competently unsupervised by end of ST5 [5] and refers to the 2020 BTS training standard. There is risk of misinterpretation of this statement in the curriculum, and we would value

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more explicit detail of the CiP required in TUS within the respiratory specialist curriculum. The view of the authors is that CiP4 Primary is the standard that should be applied.

The Advanced pathway represents the minimum skillset for respiratory physicians who are leading pleural services. The Expert pathway reflects an extended range of complex diagnostic and interventional applications, and many centres with pleural specialists will be able to offer these capabilities. For centres accepting tertiary referrals, it would be expected that all these capabilities would be available locally or through an established regional network.

Practitioners must gather evidence as suggested within the relevant TUS level pathway to demonstrate capability and therefore allow 'entrustment' at the relevant levels within the relevant operator training pathway. To facilitate progression through emergency and primary operator pathways, a specific directly observed practical procedure (DOPS) for TUS is again recommended as the principal structured assessment tool to facilitate this and is provided (online supplementary appendix 1). We would advocate for this to be accessible through the specialty trainee e-portfolio. With this update we have broadened the options for providing evidence to support entrustment in advanced and expert pathways, where a single generic DOPS may not be the best vehicle for assessment. Evidence for these pathways may therefore include peer review, multidisciplinary imaging review and service development.

There is no evidence to indicate specific numbers of examinations that should be undertaken to demonstrate capability in thoracic ultrasound. Most curricula have had indicative numbers removed, although GMC Portfolio pathways continue to specify these. Accordingly, we have not specified any indicative numbers within the CiP flowcharts for any specific procedure.

The group did consider that to support learners and trainers in planning and reviewing their experiential learning, there was merit in providing opinion in relation to this issue. Some outcomes are harder to meet and relate to less frequently occurring pathology (e.g. pleural thickening and its characterization) and so this will mean wider experience will be required. The group agreed it would be unusual for a learner to be able to meet relevant pathway outcomes without undertaking 20 examinations in Emergency and 50 scans in Primary pathways under either direct or indirect supervision

Ultimately, the decision by any trainer to grant a particular level of capability will be based on their global professional judgement of whether there is adequate evidence provided to support this. The precise definition of what constitutes "adequate" or "enough" in terms of number of procedures will vary between individual learners. No learner is "entitled" to entrustment, nor can they insist on being "signed off" on the basis of volume of procedures performed alone.

An entrustment decision can only be made at each point of progression by an operator with CiP Level 5 in the relevant (or higher) pathway.

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To allow for the varied length of placements within training programmes and for variation between individuals for time taken to achieve varying levels of competence, it is not essential that all entrustment decisions are made by the same trainer. Each trainer must, however, be satisfied that the trainee has provided enough evidence and demonstrated they are meeting the relevant outcomes within each pathway, at each entrustment point. Such evidence would be recorded by an individual in their e-Portfolio alongside procedural logs. Materials to support learners and trainers (example training log, entrustment certificates) are provided through BTS website.

It is again appreciated that trainees undertaking, but not yet at Level 4 capability in, the primary pathway may have fulfilled the criteria to be entrusted at CiP Level 4 in the Emergency pathway and hence be able to provide emergency out of hours TUS for large effusions. TUS primary pathway supervisors or TUS mentors are, therefore, able, with appropriate logbook review and DOPS, to sign off level 4 emergency pathway capability in this situation.

Trainers and TUS Mentors

Any individual with CiP Level 5 in any pathway can provide training and supervision to anyone within that (and any lower order) pathway and can make entrustment decisions up to and including Level 4 CiP. This may include senior registrars, nurses and AHPs who have been entrusted to train. Other appropriately capable practitioners may provide ad hoc clinical supervision or review of individual examinations, however formal assessment and entrustment decisions must be undertaken by a practitioner with the required CiP Level 5 capability. Providing specialist trainees annually with a regional list of individuals able to provide supervision for ad hoc opportunities in any relevant pathway, is an approach that has been helping in some regions to facilitate learning signposting. We recognise that in the 2020 standard there was little other than ongoing practice in TUS to support entrustment at Level 5 in all pathways, and that more granularity was needed to support those seeking to be recognised as trainers. We have detailed evidence of formal appraisal of practice alongside evidence of training in other pathways as principal requirements for entrustment at level 5. For Emergency pathway the authors are of the opinion that to be able to train effectively and safely it is imperative to have an understanding of more complex sonographic findings and so for that reason to supervise in Emergency pathway, we have stipulated the requirement to have CiP 4 capability in Primary TUS. Engagement with governance, quality assurance and service development evidence is expected within the Advanced and Expert pathways but is not a universal requirement for Emergency and Primary CiP Level 5. We have not stipulated the requirement to have any formal training as an educator.

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The original training standard recommended creation of local "TUS Mentors". The working group acknowledges that there has been geographical variation in their implementation and support with relevant time in job plans but still recognizes the importance of these roles as part of the governance framework around thoracic ultrasound. TUS mentors should be appointed locally to coordinate training and support governance of TUS practice. They should oversee local training arrangements, monitoring of Emergency TUS provision and the process for CiP Level 5 entrustment (akey recommendation from BTS organizational audit). TUS Mentors may also be required to make annual recommendations regarding ongoing capability towards an individual's appraisal. Trusts should recognise the demands on time that this has on individuals taking on this role, so the authors continue to advocate for TUS Mentors to have appropriate allocation of time within job plans.

TUS Mentors would usually but not exclusively be the local lead for pleural disease and actively delivering a TUS service. This role may be shared in larger (esp. multi / split site) organisations. Mentors should ideally be competent to the standard defined in the Advanced TUS pathway, but in some circumstances, this may not be possible, nor required depending on the level of service provision. It is anticipated that there would be at least one Expert TUS operator available regionally if not locally. The authors advocate creating regional pleural networks to facilitate the skill development to advanced or expert level where appropriate.

Maintenance of competency

The aim of this document is not only to provide a structure against which TUS training can be undertaken, but also to emphasize that maintenance of capabilities is essential. Recording and evidencing of ongoing capability for all practitioners should form part of annual appraisal or Annual Review of Competency Progression (ARCP), including peer review of logbook of procedures performed, complications and onward referral. Maintenance of such documentation is responsibility of the practitioner, and the authors recommend that this should be presented for review at annual appraisal / ARCP. Practitioners should approach their local TUS mentor to request recommendation regarding ongoing capability for their individual' appraisal.

A specific number of scans would not be required for this recommendation, but adequate evidence in the view of the TUS mentor indicating ongoing practice should be provided. If there are any concerns relating to capability (e.g., long gaps between cases), the local TUS mentor may request additional supporting evidence (e.g., DOPS) or additional experience to confirm capability.

For healthcare professional returning after a period away from practice (e.g., maternity leave, prolonged absence or research out of training), it is important practitioners check

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their level of capability with the local TUS mentor in the trust into which they are returning to work. This will help facilitate a supported return to work if required.

Applicability to other specialties and allied health professions

This document outlines training standards that are designed for clinicians and allied health professionals within respiratory medicine, and those who undertake the care of General Internal Medicine patients with respiratory disease. It is recognised that other training standards exists which cover aspects of TUS (in particular the point of care ultrasound standards FAMUS and FUSIC, which include components of TUS in respiratory failure). These remain separate from this standard but there will be overlap. It is again accepted that FAMUS and FUSIC accreditation would provide Emergency TUS CiP level 4, but formal agreement of such cross accreditation should be agreed at a local level with the TUS Mentor. FAMUS or FUSIC accredited operators who reach CiP level 5 Emergency level TUS are therefore able to train at this level. This is likely to include current FAMUS and FUSIC mentors (but both groups require local TUS Mentor sign off to achieve level 5 CiP). Maintenance of this CiP level will be reviewed by the local TUS Mentor as part of regular appraisal.

Further Considerations - Image storage

It is noted that demonstration of TUS CiP's will require the ability to store TUS images to facilitate review by trainers and for governance. The authors are aware that this presents technical and financial challenges to trusts. The BTS Organisational Audit recommends all trusts should have systems in place to allow the storage, retrieval and review of portable TUS images, and this is included within the BTS Quality Standard for Pleural disease.

Training courses

Formal face to face training course attendance is required for Primary Operator CiP 4 entrustment. BTS has provided a framework and minimum standards for face to face ultrasound training courses with supporting e-learning material (available at https://www.brit-thoracic.org.uk/education-and-events/bts-short-courses/thoracic-ultrasound-online-learning-and-training-resources/). This approach has had benefits in many regions in the UK and is deliverable [6]

Document review

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This represents the first revision of the BTS Training Standard in TUS. Further review is recommended in approximately 5 years and will be overseen by the BTS Education and Training Committee. Feedback is also welcomed via email to bts@brit-thoracic.org.uk

Table 1 – Level descriptors for Thoracic Ultrasound Capability in Practice

Level	Descriptor
Level 1	Entrusted to observe only – no provision of clinical care
Level 2	Entrusted to act with direct supervision, **present in the room**
Level 3	Entrusted to act with indirect supervision: The trainee may provide clinical care when the supervising physician is not physically present within the hospital or other site of patient care, but is available by means of telephone and/or electronic media to provide advice, and can attend at the bedside if required to provide direct supervision.
Level 4	Entrusted to act unsupervised
Level 5	Permission to supervise / train others

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REFERENCES

1 Stanton AE, Edey A, Evison M, Forrest I, Hippolyte S, Kastelik J, et al. British Thoracic Society Training Standards for Thoracic Ultrasound (TUS). *BMJ Open Respiratory Research*. 2020;7:e000552. https://doi.org/10.1136/bmjresp-2019-000552

2 JRCPTB. Curriculum for Respratory Medicine Specialist Training. https://www.thefederation.uk/sites/default/files/Respiratory%20Medicine%202022%20Curriculum%20FINAL_0.pdf

3 Roberts ME, Rahman NM, Maskell NA, et alBritish Thoracic Society Guideline for pleural diseaseThorax 2023;78:1143-1156.

4 Stanton AE, Aujayeb A, Bedawi EO, Davies A, Iqbal B, Laing K, et al. British Thoracic Society Training Standards for Pleural Procedures. *BMJ Open Respiratory Research*. 2025;12:e003548. https://doi.org/10.1136/bmjresp-2025-003548

5 JRCPTB. Respiratory Medicine 2022 ARCP Decision aid. https://www.thefederation.uk/sites/default/files/uploads/Respiratory%20Medicine%202022%20ARCP%20Decision%20Aid.pdf

6 Bhatnagar M, Conroy K, Prudon B, Tanner L, Forrest I , Stanton AE. New BTS Framework for face-to-face Thoracic Ultrasound Training: Deliverable with a regional approach. BTS Summer meeting 2023. bts-summer-meeting-2023-final-programme_v4.pdf

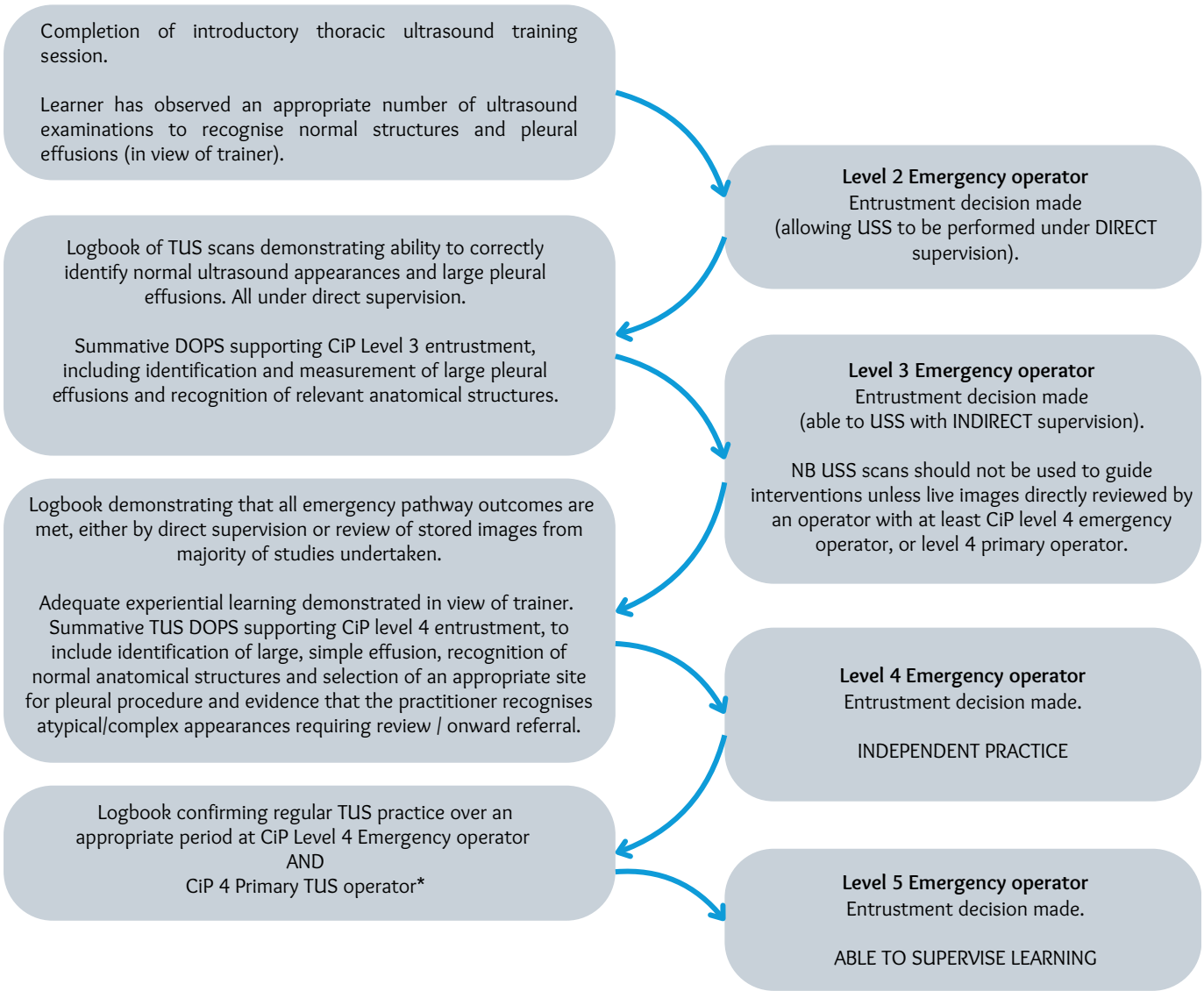
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TUS Training Standards- Emergency Operator Pathway

Aim:
To be able to practice independently in TUS to identify a large, simple, pleural effusion and select an appropriate site for urgent pleural intervention , while recognising appearances that require review or onward referral

Outcomes:
Practitioners with CiP level 4 entrustment for Emergency TUS operator will:

- Have attended an introductory TUS training session (delivered locally or externally), ideally involving a patient, demonstrating:
    - The basics of ultrasound examination
    - Familiarity with the local ultrasound machine(s) including depth, gain and probe orientation
    - The identification of normal anatomical structures and pleural effusions
    - Overview of the BTS TUS training pathway, and competency sign off requirements, including logbook
- Be able to correctly identify normal structures (lung, heart, hemi diaphragm, liver, kidneys, spleen and ribs) and their sonographic features including the curtain sign and acoustic shadowing from ribs.
- Be able to correctly identify a large (extending over at least 3 rib spaces) free flowing pleural effusion of greater than 5 cm depth on ultrasound.
- Appropriately identify a safe site for safe aspiration / drainage of fluid in a large effusion based on both anatomical position and sonographic appearances
- Recognise when ultrasound appearances are atypical for large, simple, free flowing pleural effusion and where onward referral to a higher level practitioner is made before any intervention. This includes awareness of mimickers including hepatised lung, pleural thickening and sub-diaphragmatic fluid.
- Be aware of own limitations and seek advice or onward referral
- Demonstrate annual review and appraisal of practice



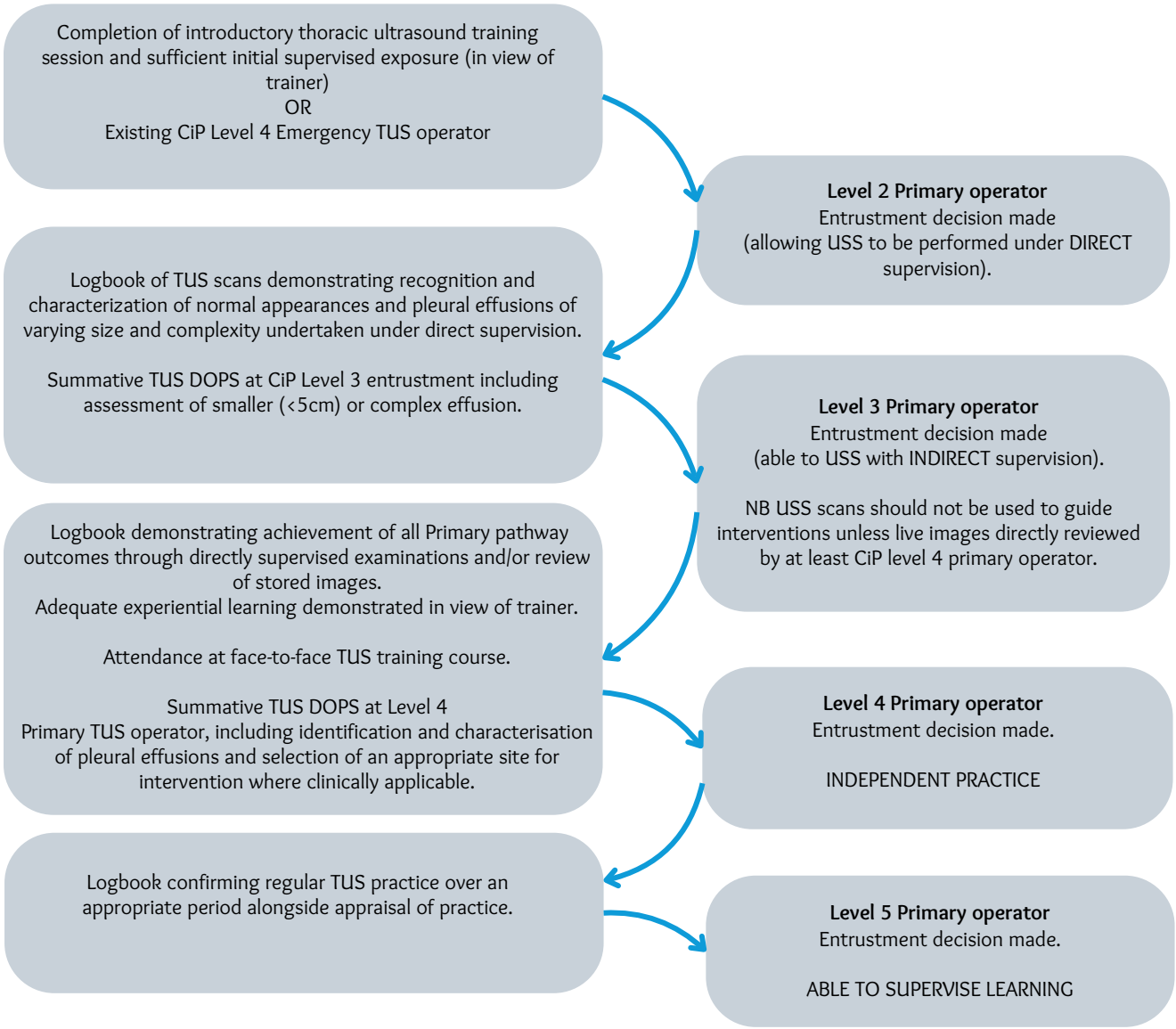
*Important trainers have understanding of where appearances more complex to support learning in the emergency pathway

TUS Training Standards- Primary Operator Pathway

Aim:
To be able to identify and characterize pleural fluid and relevant thoracic abnormalities in a variety of clinical scenarios and to enable a safe pleural procedure where applicable .

Outcomes:
Practitioners with CiP level 4 entrustment for Primary TUS operator will:

- Demonstrate they have met all objectives within the emergency operator pathway
- Have completed a TUS training course meeting BTS minimum standards for face-to-face TUS training.
- Correctly identify
    - A and B lines and lung sliding.
    - Free flowing pleural fluid, perform measurement of depth and correctly describe number of rib spaces where pleural fluid is evident.
    - Pleural effusion characteristics such as echogenicity, septations and loculations
    - Significant (more than 1cm) pleural thickening/pleural and/or diaphragmatic nodularity or mass/consolidated lung.
- Correctly describe the position, shape and basic movement of the diaphragm
- Appropriately identify site for safe aspiration/drainage of pleural fluid in the context of a complex, non-free flowing pleural effusion
- Demonstrate ability to perform TUS in sitting, supine and lateral decubitus positions.
- Recognise when ultrasound appearances are atypical for pleural fluid and where onward referral is made before any intervention
- Be aware of own limitations to seek help from advanced operators
- Demonstrate annual review and appraisal of practice

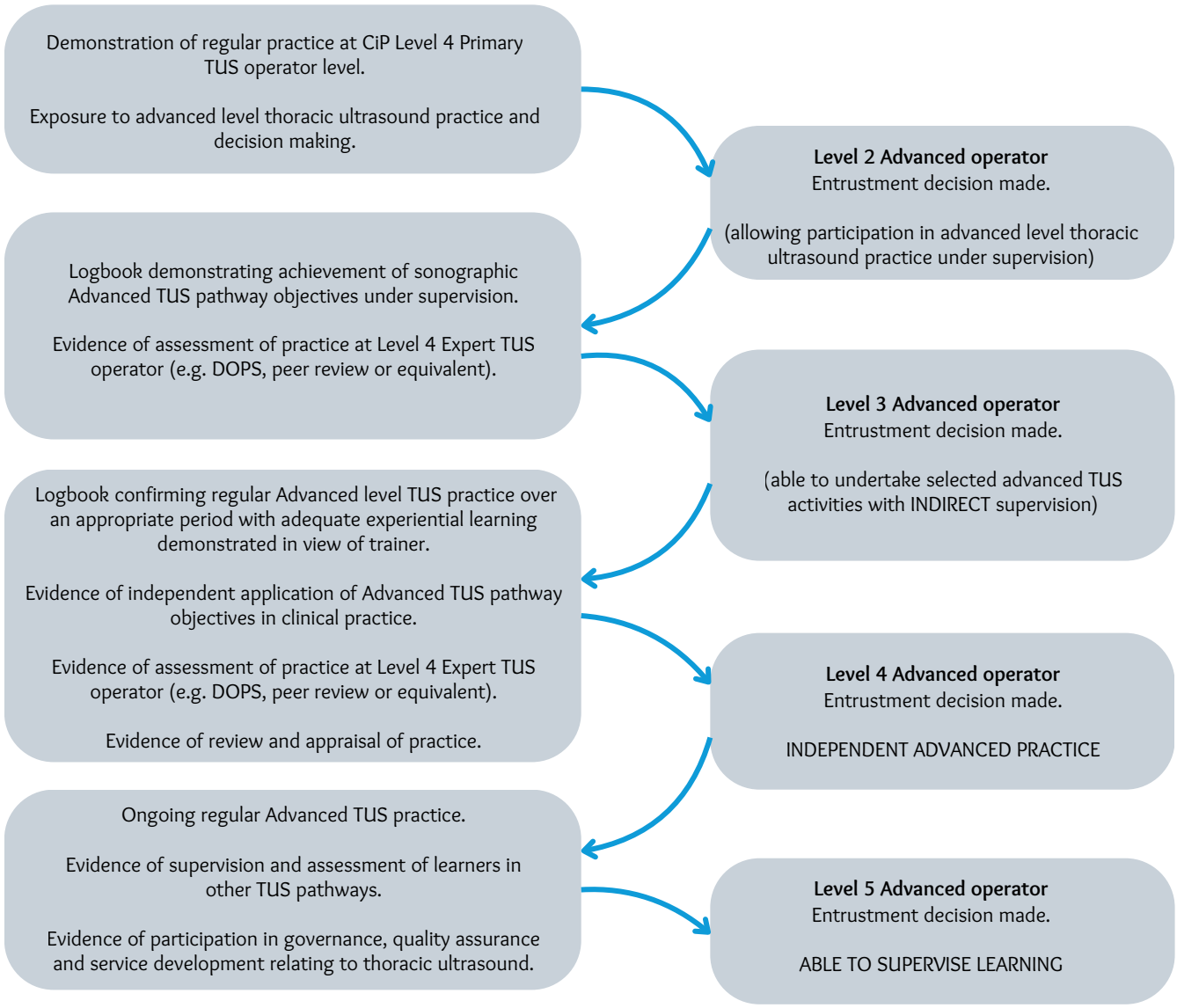


TUS Training Standards- Advanced Operator Pathway

Aim: To be able to demonstrate independent practice and expertise in more advanced ultrasound techniques and practice independently to support investigation and intervention, in more complex cases of pleural disease

Outcomes
Practitioners with CiP level 4 entrustment for Advanced TUS operator will:

- Demonstrate they have met all objectives within emergency and primary TUS pathway
- Correctly identify and characterise pleural thickening including its differentiation from fluid (e.g. using colour doppler)
- Correctly determine the absence of lung sliding in the context of pneumothorax or pleurodesis (using B and M mode)
- Perform real-time ultrasound-guided or direct visualisation pleural aspiration and chest drain insertion when required
- Be aware of own limitations and subsequent onward referral rate
- Demonstrate regular ongoing practice with contribution to a pleural service, and training in thoracic ultrasound.
- Demonstrate annual review and appraisal of practice



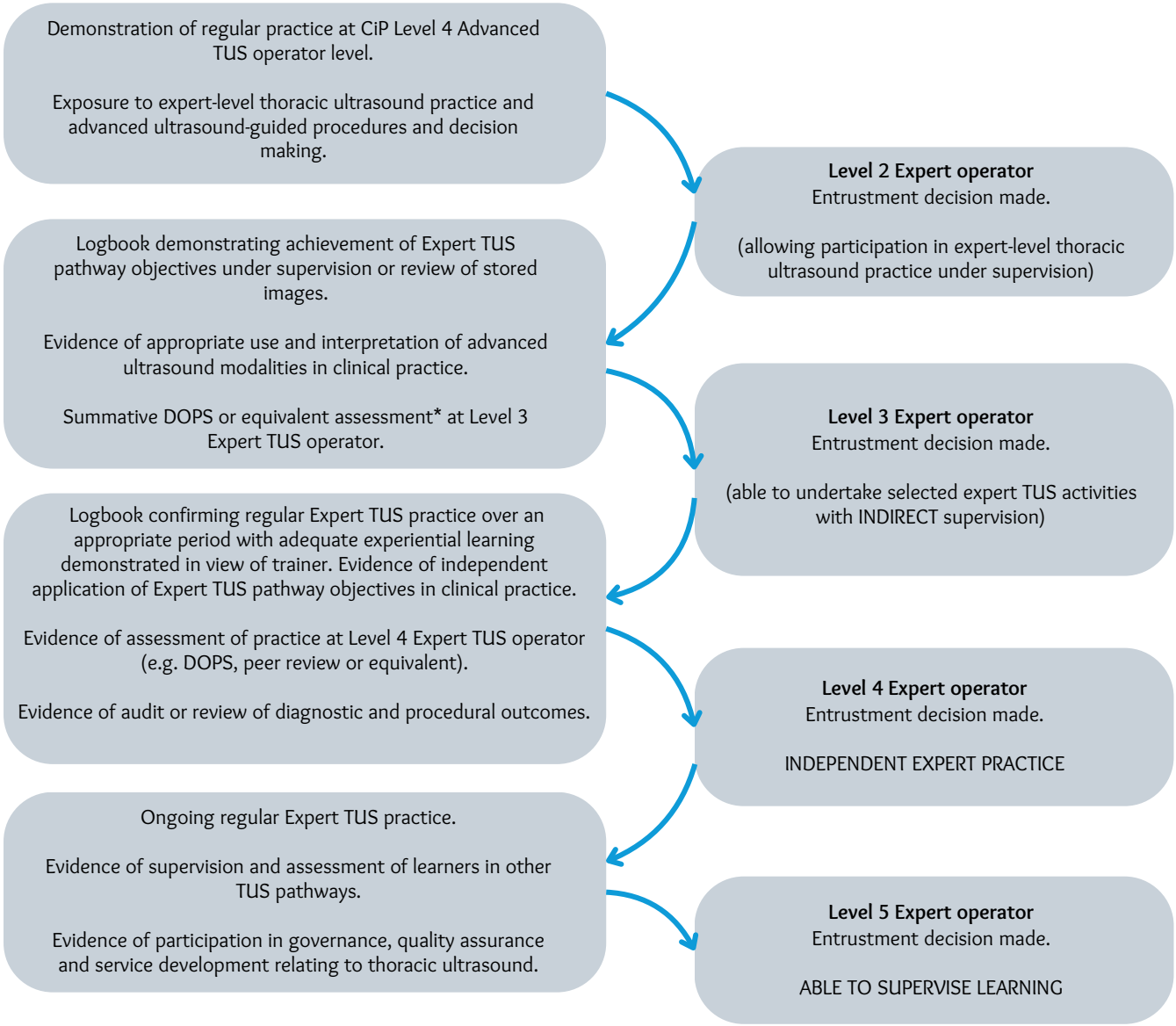
* Equivalent assessment may include peer review, review of stored images, multidisciplinary review or audit processes demonstrating advanced level capability.

TUS Training Standards- Expert Operator Pathway

Aim: To be able to independently undertake and interpret thoracic ultrasound within complex pleural diagnostic and interventional pathways, including advanced ultrasound-guided procedures and integration with other imaging modalities.

Outcomes
Practitioners with CiP level 4 entrustment for Expert TUS operator will:

- Demonstrate they have met all outcomes within Emergency, Primary and Advanced TUS pathways
- Demonstrate regular ongoing practice and training in thoracic ultrasound, including a regular pleural clinic or intervention list
- Correctly use and interpret advanced ultrasound modalities, including M-mode (eg to detect non expandable lung)
- Assess diaphragmatic movement and functional impairment using ultrasound
- Demonstrate appropriate technique to enable safe site for direct "real time" pleural biopsy.
- Use ultrasound to assess suitability and safety for pneumothorax induction during medical thoracoscopy
- Integrate thoracic ultrasound findings with clinical assessment and other imaging modalities in complex pleural disease in reaching an appropriate decision for intervention
- Recognise limitations of thoracic ultrasound and appropriately seek further imaging or specialist input where required
- Demonstrate contribution to quality assurance, peer review and audit of diagnostic and procedural outcomes
- Maintain awareness of emerging thoracic ultrasound techniques



* Equivalent assessment may include peer review, review of stored images, multidisciplinary review or audit processes demonstrating expert-level capability.