# FUSIC® Heart Training Pack

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# Details of Training Pathway

## 1. Identification of a Mentor and Supervisor

In contrast to all other modules, which now have a single trainer, FUSIC® Heart continues to divide responsibilities between Mentors and Supervisors, due to its complexity and to ensure robust quality assurance from a suitable expert.

Requirements, responsibilities, and ways to identify a Mentor and Supervisor are all outlined below:

- FUSIC® approved Mentors will already be associated with a local FUSIC® approved Supervisor, thus it is the responsibility of your Mentor to provide you with these details.
- If you cannot identify a local Mentor yourself, then please contact the ICS learning team who will be able to direct you to one.
- Definitions, roles and responsibilities of a Mentor and Supervisor are outlined below.
- If for any reason it has not been possible to identify a mentor or supervisor (due to availability), it is possible to nominate a qualified clinical colleague who possesses the correct accreditation(s) and experience to act as a Mentor and/or Supervisor on your behalf. They will however be required to make an application to become an officially recognised Mentor and/or Supervisor before training should commence.
- Application is easy using a simple form that can be accessed via the ICS website.

**Requirements for a Mentor**

Your Mentor may be any healthcare professional with relevant experience and regular practice in Intensive Care ultrasound.

***As a minimum***, Mentors are ***expected*** to have been accredited in ***FUSIC® Heart*** *or* ***BSE Level 1*** *or* ***FEEL*** for ***at least 12 months*** and be able to demonstrate support from a **local** Supervisor. Applications must be processed and approved by ICS.

**Mentors have the following responsibilities:**

- To always have an identified local Supervisor, to review difficult cases and provide ongoing clinical support.
- To enable you to access a suitable ultrasound machine and patients with pathologies relevant for successful accreditation.
- To mentor you and review your logbook scans.
- To sign-off your competencies and undertake a triggered assessment with your Supervisor.
- To countersign (with your Supervisor) your summary training record (STR) to confirm that you have satisfactorily completed all components of the accreditation.

**Requirements for a Supervisor**

Each unit delivering FUSIC® Heart training should have a nominated Supervisor.

***As a minimum***, Supervisors are ***expected*** to be accredited in:

- Level 2 **Transthoracic Echocardiography** (TTE) (i.e. BSE, EACVI, ASE) *or*
- FUSIC® HD Trainer *or*
- European Diploma in Advanced Critical Care Echocardiography (EDEC) *or*
- A Cardiologist with regular sessional commitments to TTE

**Supervisors have the following responsibilities:**

- To conduct your Triggered Assessment.
- To countersign (with your Mentor) your summary training record (STR) to confirm that you have satisfactorily completed all the training components.
- To provide expert advice and review of scans when needed by you or your Mentor.
- To provide your Mentor with ongoing training, according to their individual needs, and support for their governance infrastructure.

## 2. Registration with ICS

Registration is an essential way to ensure that you are kept up to date with all aspects of the accreditation. It will also enable you to freely access our online learning material. We therefore recommend that you register at the beginning of your learning.

- Go to the FUSIC® Heart module page.
- Click on the “add to basket” button.
- Register and pay. *Note: the cost includes registration as well as all e-learning content, and a certificate of accreditation at the end of the training.*
- Upon registration, you will receive an email providing details of what the next steps are. This can sometimes take up to 48 hours.
- Once registered, your access to all accreditation-related content will last for exactly 24 months, after which your registration will expire.

If you experience any problems, please email learning@ics.ac.uk

## 3. Completion of online training

The price of FUSIC® e-learning content is included in the cost of registration and covers the theory required to complement your learning journey. We encourage learners to access and work through it prior to starting their logbook.

## 4. Attendance on an approved course

To achieve FUSIC® Heart accreditation, you must either complete the e-learning or an ICS-approved FUSIC® Heart course. Opting to substitute your e-learning with attendance at an approved course is permissible.

## 5. Mentored practice and completion of logbook

All training documents, such as the reporting forms, logbook, competency sign offs, and Summary of Training (STR) form, can be downloaded from the FUSIC® Portal as soon as your FUSIC® registration and enrolment have been approved.

**Logbook requirements:**

- Minimum directly supervised scans – 10 (these do not have to be the first 10 scans or be contiguous)
- Minimum total number of scans – 50
- Case mix – see guidance below
- Sufficient and legible information ensuring no patient identifiable data

**Supervised cases:**

- Direct supervision is an essential part of the training process.
- A minimum number of 10 supervised scans are required, but we encourage as much direct supervision as possible throughout your logbook collection period.

**Unsupervised cases:**

- Any scans you undertake without direct supervision should be stored for review by your Mentor.
- Your training scans ***must not*** be documented in the patients' medical record or used to influence your clinical decision-making until a suitably trained individual has verified them. We recommend that training scans stored on machines or exported from them for review are labelled with a training reference, and not identifiable patient details.

**Timeline:**

- Your logbook collection period, from ***first scan*** to ***last scan*** should be no more than ***12 months*** out of the **24-month** accreditation learning period.
- Learning must also take place in the ***real world***, and we acknowledge that the FUSIC® Heart accreditation process, from registration to completion, may take time. Conversely, to combat skill fade and ensure appropriate development of knowledge and experience, we advise that scan dates be recorded and monitored closely by your mentor.
- Applications to extend this logbook collection period will only be considered under ***exceptional circumstances***, in which case you should contact the ***ICS learning team*** at

least ***4 weeks*** prior to the expiry of your ***12-month logbook window*** to request an extension.

**Case-mix:**

- A demonstrable range of pathology is essential. Fundamentally, logbook studies should be performed on ***unwell patients***.
- It is acceptable to include multiple scans from the same patient overtime if their clinical or radiological picture has changed.
- No more than 10% of logbook studies should be on healthy volunteers (who should still have been scanned within a clinical setting).
- In previous years, examinations undertaken during an approved course were accepted as directly supervised scans. However, we no longer support this practice.
- All 4 FUSIC® Heart views should be attempted in each scan however we recognise adequate images are not always possible in each view. You and your Mentor should ensure your logbook reflects that you can obtain all views competently.

**Reporting:**

- You must use the standard FUSIC® reporting form for all training ultrasound examinations as provided.
- All documents, including the summary training record form, logbook, and competency assessments, can be downloaded from the ICS FUSIC® Portal once registration is complete.

**Review:**

- Your Mentor is responsible for reviewing your logbook and signing off that you have undertaken studies and demonstrated competence in an appropriate range of pathology.
- We encourage you to meet periodically with your Mentor to review your studies. Doing so all at the end limits your learning opportunities and risks losing them altogether, after considerable expense of your time and effort. Over time you should notice increasing agreement in interpretation between you and your Mentor.

**Competence:**

- Learners acquire skills at different rates. The minimum number of scans that are likely to be necessary to demonstrate competence and to have experience of the required range of pathology, is 50.
- Your Mentor and Supervisor are responsible for assessing competence and whether you have undertaken an adequate number of scans before your Triggered Assessment.

## 6. Assessment of competence

- Once you have performed and logged an appropriate number of examinations/ procedures and have had your competencies signed off, you may undertake a triggered assessment with your Supervisor.
- If your scans are not signed off by a FUSIC® approved mentor and your final summary training record does not include a name and signature of a FUSIC® approved supervisor, they cannot be accepted.
- Once all the above steps have been followed and your **summary training record (STR)** has been completed, dated and signed off by your FUSIC® approved Supervisor, prior to submitting your STR for review, please ensure all information is legible. Then please submit your STR via the FUSIC® Portal and after approval, you will be awarded your certificate of accreditation in FUSIC® Heart.

## 7. Maintenance of competence after accreditation

- Once accredited, you will be responsible for maintaining your knowledge and competence in ultrasound by undertaking regular and relevant CPD/CME. In order to maintain your practical skills, it is important that you regularly undertake ultrasound examinations that involve an appropriate range of pathology.
- Undertaking regular audit and multidisciplinary review of your studies by advanced practitioners is an excellent way to maintain quality assurance.
- 12 months after FUSIC® Heart accreditation, with evidence of ongoing clinical activity in Heart ultrasound, you will be eligible to become a FUSIC® Heart Mentor by application to the FUSIC® learning team.

For further guidance on ‘echocardiography and ultrasound’ governance, please read GPICS 2,

# FUSIC® Heart Syllabus

## Generic Knowledge

*Physics and instrumentation*

- Properties of sound waves: amplitude, frequency, wavelength, propagation velocity.
- Ultrasound in the body:
    - Propagation velocity in different media
    - Frequency and attenuation
    - Sound and interfaces - transmission, reflection (specular, scatter), refraction, acoustic impedance.
    - Biological effects - heat generation and safety
- Sound generation:
    - Piezo-electric effect
    - Basic transducer design
    - Types of transducers
    - B mode and M mode
- Image quality:
    - Frame rate, temporal resolution, spatial resolution, axial resolution, lateral resolution and how these relate to frequency, depth and width
    - Gain
    - Focus point
    - Artefacts and their generation
- Ultrasound systems:
    - Basic components and controls
    - ECG
- Descriptive terms:
    - Hyperechoic, hypoechoic and anechoic and how they relate to structures
    - Sonographic appearance of tissues, muscle, blood vessels, nerves, bone, tendons etc

*Ultrasound techniques*

- Patient information and preparation
- Indications and limitations of focused examinations
- Relevance of other imaging modalities to ultrasound
- Influence of ultrasound results on the need for other imaging
- Selection of appropriate transducer and exam type
- Use of conductive gel
- Correct probe placement and orientation for standard views
- Correct adjustment of ultrasound controls (depth, gain, width and focus)
- Probe manipulation and nomenclature - e.g. pressure, sliding, fanning, rocking, rotating
- Scanning techniques - 2D, M-mode
- Identification of relevant anatomy and common artefacts

*Administration and governance*

- Image recording, reporting and storage
- Indications for immediate expert assistance, subsequent comprehensive scan by accredited practitioner or need for alternative investigation
- Medico-legal aspects - outlining the responsibility to practice within specific levels of competence and the requirements for training
- Need to quality assure reports
- Relevance of data protection act to image storage
- Consent
- Understanding sterility, infection control and machine cleaning
- The value and role of departmental protocols
- The resource implications of ultrasound use

## Module Specific knowledge (FUSIC® Heart)

*Knowledge*

- Indications and limitations of focused echo
- Relationship between conduct of peri-arrest echo and the ALS algorithm
- Format of standard echo report

*Performance of systematic examination of the heart*

- Scanning the heart from the PLAX, PSAX, A4C and subcostal windows

*Recognition of normal anatomy*

- Pericardium, walls, chambers, valves, great vessels, lung, ribs, sternum

*Recognition of pathology including*

- LV dilatation - left ventricular internal diameter in diastole (LVIDd) >6cm[1]
- RV dilatation - RV area >2/3 the size of the LV
- Ventricular dysfunction - reduction in wall thickening and motion, TAPSE, MAPSE
- Regional wall motion abnormalities - regional reduction in wall motion and thickening
- RV dilatation, D shaped septum, paradoxical septal motion
- Features of low venous return (vasodilatation, hypovolaemia) - small, collapsing IVC, small, hyperdynamic LV and RV, papillary apposition in systole
- Pericardial and or pleural collection - distinguish one from the other

*Clinical integration and conclusions*

- Is the left ventricle significantly dilated or impaired?
- Is the right ventricle significantly dilated or impaired?
- Are there features of low venous return?
- Is there a pericardial effusion?
- Is there a pleural effusion?

[1] Please note that LVIDd >6 cm is significantly dilated. We recommend using the BSE normal reference intervals for dimensions.