**Echocardiography Curriculum Delivery Tool**

**November 2016**

**How to use this document**

This document helps to document that all necessary curriculum requirements for basic echocardiography training for cardiology StRs (ST3-ST5). It replaces all previous versions.

Obtaining BSE accreditation demonstrates more comprehensive training and is preferred. This tool should be seen as complimentary and can help assess progress towards that. It should therefore be completed by ALL trainees (for details on phased implementation for trainees who started before November 2016, refer to the guidance on the JRCPTB website [specialty page](http://www.jrcptb.org.uk/specialties/cardiology)).

This document should be read in conjunction with the current version of the cardiology curriculum, as accessed on JRCPTB website.

Trainees should aim to complete the BSE eLearning tool ([www.bsecho.org](http://www.bsecho.org)), ideally within 3 months of the start of training. Demonstration of satisfactory completion by end of core training at latest is expected.

NOTE:

* At each hospital, you must have a supervisor who should be a senior and experienced echocardiographer, ideally having BSE accreditation. They should review this tool with you to understand your current learning needs and sign off sections relevant to your training
* If you have any difficulty in identifying this person, or in getting appropriate support in your training, please inform either your TPD or STC echo lead as soon as possible.
* Your supervisor should initial and date each entry once he or she is satisfied that you are competent to **perform and report unsupervised**
* Your final sign-off at the end of core training should ideally be by a physician with an interest in imaging or, if signed by an echocardiographer, be counter-signed by your educational supervisor. A scanned or down-loaded form of this document should be uploaded to your ePortfolio personal library on completion.
* Aim to obtain sign off of basic emergency echocardiography (or FEEL scan) as soon as possible, as minimum within 6 months of starting training. You should not use echo unsupervised during on call activity until then.
* You should also keep a log-book of all cases, capturing indication and key findings. Typically trainees should be capturing minimum of 150-200 cases per year over the first three years of training. This must be available for review when discussing sign off of any section
* The theory component will be self-taught. Your department should have suitable text-books. As an alternative or in addition, use an on line training tool , eg: [*http://www.escardio.org/communities/EACVI/education/Pages/basic-echocardiography-course.aspx#*](http://www.escardio.org/communities/EACVI/education/Pages/basic-echocardiography-course.aspx%23%20%20)
* In your ST5 year, you MUST collate 5 cases across a range of pathologies which you have independently acquired and reported. These must be reviewed and documented by your supervisor as part of the final sign-off process

**1. Basic Emergency Echocardiography (FEEL SCAN): sign off by mid-point ST3**

Focused echocardiography in emergency life support (FEEL-UK) is a formal taught programme. As an equivalent, your STC may have organised local simulation and clinical training.

Acquire 4 standard TTE views -

PLAX, PSAX, A4Ch, Subcostal

Recognise potentially treatable causes of circulatory collapse

Pericardial collection – massive pericardial effusion

Severe myocardial insufficiency

Pulmonary embolus – massive and sub-massive

Severe hypovolaemia

Exclusion of VF

**SECTION SIGN OFF**

**No of cases in log book**

**Simulation course Y/N**

**FEEL Course attended Y/N**

*I confirm that this trainee has demonstrated ability to perform a FEEL scan competently and independently*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2. BASIC ECHOCARDIOGRAPHY: sign off by mid-point ST3**

**Knowledge**

* Basic principles of ultrasound
* Basic principles of spectral Doppler
* Basic principles of colour flow Doppler
* Basic instrumentation
* Ethics and sensitivities of patient care
* Basic anatomy of the heart
* Basic echocardiographic scan planes
* Parasternal long axis standard, RV inflow, RV outflow
* Parasternal short axis including aortic valve, mitral valve and papillary muscles
* Apical views, 4- and 5-chamber, 2-chamber and long-axis
* Indications for transthoracic and tranoesophageal echocardiography

**Practical competencies** Initials and date

Interacts appropriately with patients

Explains procedure, offers chaperone if appropriate,

shows respect for patient dignity at all times.

Understands basic instrumentation

Demonstrates appropriate use of sector width, gain control, focus

Cares for machine appropriately

Can obtain all standard views

Parasternal LAX and SAX. Apical 4, 2 and 3 chamber

Sub costal, suprasternal

Can obtain standard measurements using 2D or M-mode

Lv, la and aortic dimensions. Simpsons biplane.

Can recognise normal variants

Eg Eustachian valve, chiari network, LV tendon

Can use colour examination in at least two planes for all

valves optimising gain and box-size

Can obtain pulsed Doppler at

a) left ventricular inflow (mitral valve)

b) left ventricular outflow tract ( LVOT )

c) right ventricular inflow ( tricuspid valve)

d) right ventricular outflow tract, pulmonary valve & main pulmonary artery

**SECTION SIGN OFF**

**No of cases in log book**

**No of echo DOPS performed**

*I confirm that this trainee has demonstrated competency in basic echocardiography with knowledge appropriate to stage of training*.

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3. LEFT VENTRICLE: Sign off by end ST3**

**Knowledge**

* Coronary anatomy and correlation with 2D views of left ventricle.
* Segmentation of the left ventricle
* Wall motion
* Measurements of global systolic function. (LVOT VTI, stroke volume, fractional shortening)
* Doppler mitral valve filling patterns & normal range
* Appearance of complications after myocardial infarction
* Aneurysm, pseudoaneurysm,
* Ventricular septal and papillary muscle rupture
* Ischaemic mitral regurgitation
* Features of dilated, and hypertrophic cardiomyopathy
* Common differential diagnosis
* Athletic heart, hypertensive disease

**Practical competencies**

Can differentiate normal from abnormal LV systolic function

Can recognise large wall motion abnormalities

Can describe wall motion abnormalities and myocardial segments

Can obtain basic measures of systolic function

VTI, FS, LVEF

Understands & can differentiate diastolic filling patterns

Can detect and recognise complications after myocardial infarction

Understands causes of a hypokinetic left ventricle

Can recognise features associated with hypertrophic cardiomyopathy

Demonstrates appropriate use of tissue velocity imaging

**SECTION SIGN OFF**

**Number of LV function cases in log book**

**DOPS covering LV function assessment reviewed**

*I confirm that this trainee has demonstrated ability to assess and report in LV function*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4. MITRAL VALVE DISEASE: Sign off by end ST4**

**Knowledge**

* Normal anatomy of the mitral valve, and the subvalvar apparatus and their relationship with LV function
* Causes of mitral stenosis and regurgitation
* Ischaemic, functional, prolapse, rheumatic, endocarditis
* Criteria for surgical referral and reasons for taking the relevant measurements

**Practical competencies**

Can recognise rheumatic disease

Can recognise mitral prolapse

Can recognise functional mitral regurgitation

Can assess mitral stenosis

2D planimetry, pressure half-time, gradient

Can assess mitral regurgitation, MR index,

chamber size, signal density, concepts of proximal flow

acceleration & vena contracta,

**SECTION SIGN OFF**

**Number of MV cases in log book**

*I confirm that this trainee has demonstrated ability to assess MV disease*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5. AORTIC VALVE DISEASE and AORTA : Sign by end ST4**

**Knowledge**

* Causes of aortic valve disease
* Causes of aortic disease
* Methods of assessment of aortic stenosis and regurgitation
* Basic criteria for surgery to understand reasons for making measurements

**Practical competencies**

Can recognise bicuspid, rheumatic, and degenerative disease

Can recognise a significantly stenotic aortic valve

Can derive peak & mean gradients using continuous wave Doppler

Can quantify aortic regurgitation

Can recognise dilatation of the ascending aorta

Knows the echocardiographic signs of dissection

**SECTION SIGN OFF**

**Number of AV cases in log book**

**DOPS covering AV function assessment reviewed**

*I confirm that this trainee has demonstrated ability to assess AV function*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**6. RIGHT HEART: Sign off by end ST5**

**Knowledge**

* Causes of tricuspid and pulmonary valve disease
* Causes of right ventricular dysfunction
* Causes of pulmonary hypertension
* The imaging features of pulmonary hypertension
* The estimation of pulmonary pressures

**Practical competencies**

Recognises right ventricular dilatation

Ability to estimate RV systolic function

* TAPSE, awareness of role of 3D

Can estimate PA systolic pressure

**SECTION SIGN OFF**

**Number of right heart cases in log book**

*I confirm that this trainee has demonstrated ability to assess right heart function*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**7. REPLACEMENT HEART VALVES: Sign off by end ST5**

**Knowledge**

* Types of valve replacement
* Criteria of normality
* Signs of failure
* Indications for TOE

**Practical competencies**

Can recognise broad types of replacement valve

Can recognise prosthetic valve dysfunction –

morphology, seating, regurgitation, obstruction

**SECTION SIGN OFF**

**Number of prosthetic valve cases in log book**

*I confirm that this trainee has demonstrated ability to assess prosthetic valve*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**8. INFECTIVE ENDOCARDITIS: Sign off by end ST5**

**Knowledge**

* Duke criteria for diagnosing endocarditis
* Echocardiographic features of endocarditis
* Criteria for TOE

**Practical competencies**

Can recognise typical vegetations

Can recognise an abscess

**SECTION SIGN OFF**

**Number of endocarditis cases in log book**

**DOPS covering endocarditis assessment reviewed**

*I confirm that this trainee has demonstrated ability to perform and report echocardiography in patient with endocarditis*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**9. INTRACARDIAC MASSES: Sign off by end ST5**

**Knowledge**

* Types of mass found in the heart
* Features of a mxyoma
* Differentiation of atrial mass
* Normal variants and artifacts

**Practical competencies**

Can recognise a LA myxoma

Can recognise intracardiac thrombus and

Demonstrate awareness of role of echo contrast

**SECTION SIGN OFF**

**Number of intracardiac mass cases in log book**

I confirm that this trainee has demonstrated ability to assess intra-cardiac masses

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**10. CARDIOMYOPATHIES: Sign off by end ST5**

**Knowledge**

* Features of different types of cardiomyopathies
* Role of other imaging modalities
* Indications for intervention (ICD, surgery)

**Practical competencies**

Can differentiate dilated, hypertrophic and restrictive CMP

and identify secondary/treatable causes –

eg: IHD, infiltrative diseases, hypertension, aortic stenosis

Can recognise high risk features –

septal thickness, LVOT gradient etc

**SECTION SIGN OFF**

**Number of cardiomyopathy mass cases in log book**

*I confirm that this trainee has demonstrated ability to assess cardiomyopathy*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**11. PERICARDIAL DISEASE: Sign off by end ST 5**

**Knowledge**

* Features of tamponade
* RV collapse, effect on IVC, A-V valve flow velocities

**Practical competencies**

Can differentiate a pleural and pericardial effusion

Can recognise the features of tamponade

Can judge the route for pericardiocentesis

Can attempt to differentiate restriction and constriction

**SECTION SIGN OFF**

**Number of pericardial disease cases in log book**

*I confirm that this trainee has demonstrated ability to assess pericardial disease*

NAME: Signature and date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FINAL SIGN OFF**

I have reviewed this trainee’s logbook, DOPS and Echo Curriculum Delivery Tool

I have also reviewed 5 video cases covering the following pathology:

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

I am satisfied that he/she is able to independently and satisfactorily perform, interpret and report transthoracic echocardiography for the diagnosis and assessment of adult patients.

NAME: Signature and date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Job title:

Educational supervisor name:

Signature and date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Annex

**List of supervisors**

Name Date Qualification Specimen signature