SPECIALTY TRAINING CURRICULUM

FOR

PAEDIATRIC CARDIOLOGY

AUGUST 2010

Joint Royal Colleges of Physicians Training Board

5 St Andrews Place
Regent's Park
London NW1 4LB

Telephone: (020) 79351174
Facsimile: (020)7486 4160
Email: ptb@jrcptb.org.uk
Website: www.jrcptb.org.uk

Table of Contents

1 Introduction

Paediatric Cardiology is practised in regional centres staffed by three or more consultant paediatric cardiologists, with the supporting personnel and equipment necessary to diagnose and treat children with cardiac conditions. These centres are either part of paediatric hospitals or major cardiothoracic centres. The specialty provides a service from fetal life, through childhood, into adulthood and is concerned with diseases of the heart in the growing and developing individual. Close liaison with paediatrics, paediatric subspecialties, cardiothoracic surgery, adult cardiology, obstetrics, radiology and pathology is required. The paediatric cardiologist in training must have a thorough grounding in paediatrics and should be capable of providing all round patient care.

Training includes the investigation and treatment of children with congenital heart disease, acquired heart disease, arrhythmias and disturbances of circulatory function. Paediatric cardiology is an academic as well as clinical specialty and the paediatric cardiologist has a major role in the education of students, doctors, primary health care specialists, nurses and paramedical personnel. Most paediatric cardiologists engage in basic or clinical research.

2 Rationale

2.1 Purpose of the Curriculum

The purpose of this curriculum is to define the process of training and the competencies needed for the award of a certificate of completion of training (CCT) in Paediatric Cardiology.

The curriculum covers training for all four nations of the UK.

2.2 Development

This curriculum was developed by the Specialty Advisory Committee for Paediatric Cardiology under the direction of the Joint Royal Colleges of Physicians Training Board (JRCPTB). It replaces the previous version of the curriculum dated May 2007, with changes to ensure the curriculum meets GMC's standards for Curricula and Assessment, and to incorporate revisions to the content and delivery of the training programme. Major changes from the previous curriculum include the incorporation of leadership, health inequalities and common competencies.

The demands of patients with congenital heart disease have changed considerably over the last decade with increasing expertise and technological advances being reflected in the training programme. In particular, this curriculum recognises the importance of concentration of expertise and avoidance of occasional practice in improving the long term care of patients with congenital heart disease. The increasingly complex practice of modern congenital cardiology dictates that cardiologists should have at least one area of specialist area expertise. The current demand and lower threshold for specialist referral for cardiology opinion has led to the main changes in this curriculum, which relate to more clearly defined training with an initial 3 years of general paediatric cardiologist followed by 2 years of specialist area training. Specialist area training is modular and can be in more than one of the 8 recognised specialist areas.

2.3 Training Pathway

Specialty training in Paediatric Cardiology consists of core and higher speciality training. Core training provides physicians with: the ability to investigate, treat and diagnose patients with acute and chronic medical symptoms; and with high quality review skills for managing inpatients and outpatients. Higher speciality training then builds on these core skills to develop the specific competencies required to practise independently as a consultant Paediatric Cardiologist.

Core training may be completed in Paediatrics (ST1-3) or Core Medical Training (CMT ST1-2) followed by Level 1 training in paediatrics (basic paediatric competencies). The full curriculum for specialty training in Paediatric Cardiology therefore consists of either:

1. The curriculum for CMT plus the Framework of Competencies for Level 1 Training in Paediatrics (basic paediatric competencies) (ST1-3)
   Or

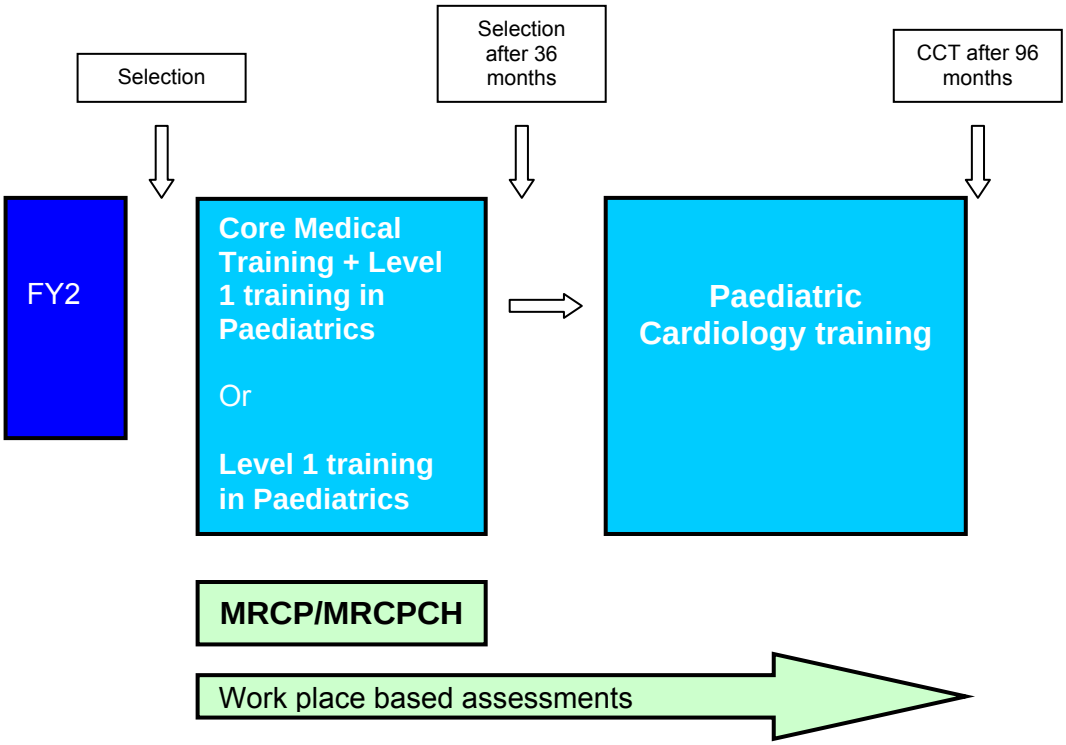
2. The Framework of Competencies for Level 1 Training in Paediatrics (ST1-3)
   Plus

   This specialty training curriculum for Paediatric Cardiology.

The approved curriculum for CMT is a sub-set of the Curriculum for General Internal Medicine (GIM). A “Framework for CMT” has been created for the convenience of trainees, supervisors, tutors and programme directors. The body of the Framework document has been extracted from the approved curriculum but only includes the syllabus requirements for CMT and not the further requirements for acquiring a CCT in GIM.

Core Medical training programmes are designed to deliver core competencies as part of specialty training by acquisition of knowledge, skills and behaviours as assessed by the workplace-based assessments and the MRCP(UK). Programmes are usually for two years and are broad-based consisting of four to six placements in medical specialties. These placements over the two years must include direct involvement in the acute medical take. Trainees are asked to document their record of workplace-based assessments in an ePortfolio which will then be continued to document assessments in specialty training. Trainees completing core training will have a solid platform of common knowledge and skills from which to continue into Specialty Training at ST3, where these skills will be developed and combined with specialty knowledge and skills in order to award the trainee with a certificate of completion of training (CCT).

It is anticipated that most trainees will enter paediatric cardiology training from core paediatric training but it remains important for trainees to be able to enter the specialty from core training in adult medicine. For trainees undertaking initial training in CMT then it will be necessary for them to obtain basic paediatric competencies. It is anticipated that level 1 paediatric competencies could be achieved during a 12 month period of paediatric training after completion of CMT. For trainees where it has not been possible to acquire these competencies before application for training in paediatric cardiology then this experience should be arranged by the deanery as fixed term training upon entry into specialist training in paediatric cardiology (resulting in an extension of the overall period of training). This period of paediatric training is likely to be achieved in 12 months and should include training in neonatal paediatrics, perhaps for a nominal 6 month period.



2.4 Enrolment with JRCPTB

Trainees are required to register for specialist training with JRCPTB at the start of their training programmes. Enrolment with JRCPTB, including the complete payment of enrolment fees, is required before JRCPTB will be able to recommend trainees for a CCT. Trainees can enrol online at www.jrcptb.org.uk

2.5 Duration of Training

The total duration of training in paediatric cardiology is an indicative 8 years (3 years core paediatrics or 2 years acute medicine training with an additional year of basic paediatric training and 5 years of specific paediatric cardiology training), but will depend on the achievement of the training competencies rather than a rigid duration of training. A period of training abroad is permissible during the training programme but prospective approval from the Deanery and the SAC for such “out of programme” training is essential.

2.6 Less Than Full Time Training (LTFT)

Trainees who are unable to work full-time are entitled to opt for less than full time training programmes. EC Directive 2005/36/EC requires that:

- LTFT shall meet the same requirements as full-time training, from which it will differ only in the possibility of limiting participation in medical activities.
- The competent authorities shall ensure that the competencies achieved and the quality of part-time training are not less than those of full-time trainees.

The above provisions must be adhered to. LTFT trainees should undertake a pro rata share of the out-of-hours duties (including on-call and other out-of-hours commitments) required of their full-time colleagues in the same programme and at the equivalent stage.

EC Directive 2005/36/EC states that there is no longer a minimum time requirement on training for LTFT trainees. In the past, less than full time trainees were required to work a minimum of 50% of full time. With competence-based training, in order to retain competence, in addition to acquiring new skills, less than full time trainees would still normally be expected to work a minimum of 50% of full time. If you are returning or converting to training at less than full time please complete the LTFT application form on the JRCPTB website www.jrcptb.org.uk .

Funding for LTFT is from deaneries and these posts are not supernumerary. Ideally therefore 2 LTFT trainees should share one post to provide appropriate service cover.

Less than full time trainees should assume that their clinical training will be of a duration pro-rata with the time indicated/recommended, but this should be reviewed during annual appraisal by their TPD and chair of STC and Deanery Associate Dean for LTFT training. As long as the statutory European Minimum Training Time (if relevant), has been exceeded, then indicative training times as stated in curricula may be adjusted in line with the achievement of all stated competencies**.**

3 Content of Learning

3.1 Programme Content and Objectives

The most important function of the specialist training programme is to educate individuals who will become consultants capable of providing the highest standard of service to children with cardiac disorders and adolescents and adults with congenital heart disease. The educational process set out in this curriculum aims to develop positive attitudes to lifelong learning and aims to equip the trainee to adapt to the changing expectations of society as well as to technological advances. The syllabus within this curriculum sets out the subject matter to be covered during training. The planned outcomes of the training programme are included, with clear goals for achievement of a sound knowledge base, appropriate attitudes and achievement of competencies as well as appropriate methods of learning and assessment throughout the programme.

The education programme in paediatric cardiology aims to produce physicians who:

- Address all aspects of the healthcare needs of patients and their families
- Communicate effectively with children, families, and colleagues
- Are able to coordinate effectively the work of the paediatric cardiology team
- Manage time and resources to the benefit of themselves, their patients and their colleagues
- Are able to operate as safe independent practitioners whilst recognising the limitation of their own expertise and the obligation to seek assistance of colleagues where appropriate
- Have acquired and developed team working and leadership skills
- Work effectively with other health care professionals
- Are able to teach other physicians and health care professionals

- Will be honest and objective when assessing the performance of those they have supervised and trained
- Develop clinical practice which is based on an analysis of relevant clinical research and have an understanding of research methodology
- Are aware of current thinking about ethical and legal issues
- Can take advantage of information technology to enhance all aspects of patient care
- Maintain the highest standard in their professional field and show themselves able to respond constructively to assessments and appraisals of professional competence and performance
- Are able to identify and take responsibility for their own educational needs and the attainment of these needs
- Are aware of procedures and able to take action when things go wrong, both in their own practice and in that of others
- Work effectively and efficiently in health care organisation
- Are able to apply the knowledge of biological and behavioural sciences in clinical practice
- Apply appropriate knowledge and skill in the diagnosis and management of children with cardiovascular disorders and adults with congenital heart disease
- Are competent to perform the core investigations required for the evaluation of children with cardiovascular disorders and adults with congenital heart disease.
- Can develop management plans for the whole patient and maintain knowledge of other areas of paediatrics and adult medicine which impinge on the specialty of paediatric cardiology.

3.2 Good Medical Practice

In preparation for the introduction of licensing and revalidation, the General Medical Council has translated Good Medical Practice into a Framework for Appraisal and Assessment which provides a foundation for the development of the appraisal and assessment system for revalidation. The Framework can be accessed at http://www.gmc-uk.org/Framework_4_3.pdf_25396256.pdf

The Framework for Appraisal and Assessment covers the following domains:
Domain 1 – Knowledge, Skills and Performance
Domain 2 – Safety and Quality
Domain 3 – Communication, Partnership and Teamwork
Domain 4 – Maintaining Trust

The “GMP” column in the syllabus defines which of the 4 domains of the Good Medical Practice Framework for Appraisal and Assessment are addressed by each competency. Most parts of the syllabus relate to “Knowledge, Skills and Performance” but some parts will also relate to other domains.

3.3 Structure of the Syllabus

The curriculum document sets out a detailed syllabus for each of these skills. Part 1 deals with common skills, Part 2 with clinical skills and Part 3 with procedural skills. Part 4 sets out Medical Leadership competencies and Part 5 details the Specialist Area Training modules.

In clinical skills and practical procedures, learning will usually follow a series of stages:

- Basic knowledge
- Knowledge of how to carry out the objective
- Ability to carry out the objective with assistance
- Ability to carry out the objective with supervision
- Ability to carry out all aspects of the objective independently.

Part 1- Common Learning Objectives

By the end of specialist training the trainee should have developed competence in the following:

- Good clinical care
- History, examination, investigations, treatment, notekeeping and correspondence
- Managing chronic disease
- Time management and decision making
- Communication skills
- Maintaining good medical practice
- Maintaining Trust
- Professional behaviour
- Ethics and legal issues
- Patient education and disease prevention
- Working with colleagues
- Teamwork and leadership skills
- Teaching and educational supervision
- Research
- Clinical governance
- Structure of the NHS and principles of management
- Information use and management
- Cross-specialty skills
- Admissions and discharges
- Discharge planning
- Resuscitation
- Nutrition

Part 2 – Clinical Learning Objectives

By the end of the education programme the trainee is expected to manage the following clinical problems:

- Cardiovascular collapse in infancy
- Cardiac failure in infants and children
- Cyanosis in the newborn period
- Cyanosis beyond the newborn period
- Evaluation of the child with a cardiac murmur
- Evaluation of children and adolescents with chest pain, palpitations, presyncope or syncope
- Patients with acyanotic congenital heart disease
- Left to right shunting defects
- Duct dependent systemic circulation
- Obstructive left heart lesions
- Acyanotic obstructive right heart lesions
- Patients with cyanotic congenital heart disease
- Duct dependent pulmonary circulation
- Transposition of the great arteries
- Cyanotic congenital heart disease with high pulmonary flow
- Complex cyanotic congenital heart disease

- Pulmonary hypertension
- Fontan circulation
- Inflammatory cardiovascular disease
- Cardiomyopathy and myocarditis
- Prevention and management of infective endocarditis
- Cardiovascular abnormalities in neonatal intensive care
- Cardiovascular evaluation of children with genetic disorders and syndromes
- Cardiac evaluation of the child with stridor
- Detection and management of fetal cardiac abnormalities
- Adolescent and adult congenital heart disease
- Arrhythmias
- Paediatric cardiac transplantation
- Nutrition and growth in congenital heart disease
- Assessment of children prior to cardiac surgery
- Care of children following cardiac surgery
- Assessment of children with cardiac disease prior to non-cardiac surgery
- Management of critically ill children with cardiovascular compromise

Part 3 – Investigations and Procedures

Investigations and procedures all trainees are expected to select appropriately and either perform competently and/or interpret correctly

- 12 lead ECG
- Ambulatory ECG
- Exercise test
- Cardiac event recorder
- ECG with adenosine challenge
- Chest x-ray
- DC cardioversion
- Basic cardiac pacing
- Pericardiocentesis
- Balloon atrial septostomy
- Transthoracic echocardiography
- Echocardiography with contrast study
- Transoesophageal echocardiography

Investigations all trainees should be able to select and interpret appropriately (the trainee is not expected to perform these tests)

- CT scanning
- Magnetic resonance imaging
- Cardiac catheterisation
- Radiation use and safety
- Tilt table testing

Part 4 – Medical Leadership Competencies

The Medical Leadership Competency Framework, developed by the Academy of Medical Royal Colleges and the NHS Institute for Innovation and Improvement, has informed the inclusion of leadership competencies in this curriculum. The Framework identified possible assessment methods, but in reviewing these we identified a need for more specific methods. JRCPTB and the RCP Education Department has established a working group to develop and evaluate leadership assessment methods. These may include variants of CbD and ACAT, as well as the Case Conference Assessment Tool currently being piloted.

Part 5 – Specialist Area Training Modules

Trainees wishing to develop a special interest should aim to achieve basic competence in that area during the first three years of the training programme. Trainees who enter a specific sub-specialist training post will spend a much greater proportion of clinical and research time devoted to the special interest after the general 3 year training programme has been completed. In the majority of cases only one special interest should be developed, although in certain circumstances two compatible special interests may be accommodated in the training programme (for example CT and MRI with advanced echocardiography)

The main specialist training areas are as follows:

- Adult congenital heart disease
- Fetal cardiology
- Advanced imaging (CT/MRI)
- Diagnostic and therapeutic catheterisation
- Invasive electrophysiology and pacing in children and adults with congenital heart disease
- Pulmonary hypertension
- Heart failure and cardiac transplantation
- Advanced echocardiography

3.4 Syllabus

In the tables below, the “Assessment Methods” shown are those that are appropriate as **possible** methods that could be used to assess each competency. It is not expected that all competencies will be assessed and that where they are assessed not every method will be used. See section 5.2 for more details.

“GMP” defines which of the 4 domains of the Good Medical Practice Framework for Appraisal and Assessment are addressed by each competency. See section 3.2 for more details.

Where there is a * in the syllabus this competency will be assessed, in the future, by a knowledge-based assessment method. Please see section 5 for further details.

Syllabus Contents

Part 1 – Common Learning Objectives

1. Good Clinical Care

History

To be able to carry out specialist assessment of patients by means of history taking, physical examination and use of relevant investigations

To implement appropriate treatment, keep accurate records and communicate findings effectively

Knowledge	Assessment Methods	GMP
Define the patterns of symptoms found in patients presenting with disease	CbD, mini-CEX	1
Skills		
Be able to take and analyse a clinical history in a relevant succinct and logical manner	CbD, mini-CEX	1
Be able to overcome difficulties of language, physical and mental impairment	mini-CEX, MSF	1,3
Use interpreters and advocates appropriately	mini-CEX, MSF	1,3
Be able to communicate effectively with children in a non-threatening manner	mini-CEX-CEX	1,3,4
Behaviours		
Show empathy with patients	CbD, mini-CEX, MSF, PS	1,3
Appreciate the importance of psychological factors of patients and relatives	CbD, mini-CEX, MSF, PS	1,2,3,4
Appreciate the interaction of social factors and the patient's illness	CbD, mini-CEX, MSF, PS	1,2,3

Examination

To be able to carry out specialist assessment of patients by means of history taking, physical examination and use of relevant investigations

To implement appropriate treatment, keep accurate records and communicate findings effectively

Knowledge	Assessment Methods	GMP
Define the pathophysiological basis of physical signs	CbD, mini CEX	1
Define the clinical signs found in diseases	CbD, mini CEX	1
Skills		
Be able to perform a reliable and appropriate examination	DOPS, mini-CEX	1
Be able to examine children in an appropriate manner	mini-CEX	1,3,4
Behaviours		
Respect patients' dignity and confidentiality	mini-CEX, PS	1,2,4
Acknowledge cultural issues	CbD, mini-CEX, PS	1,2,3,4
Involve relatives appropriately	CbD, mini-CEX, PS	1,2,3,4

Appreciate the need for a chaperone	CbD, mini-CEX	1,2,3,4

Investigations, Including Imaging

To be able to carry out specialist assessment of patients by means of history taking, physical examination and use of relevant investigations

To implement appropriate treatment, keep accurate records and communicate findings effectively

Knowledge	Assessment Methods	GMP
Define the pathophysiological basis of investigations	CbD, DOPS, mini-CEX	1
Define the indications for investigations	DOPS, mini-CEX	1
Define the risks and benefits of investigations	CbD, DOPS, mini-CEX	1
Know the cost effectiveness of individual investigations	CbD, mini-CEX	1
Skills		
Be able to interpret the results of investigations	CbD, DOPS, mini-CEX	1
Be able to perform investigations competently where relevant	DOPS	1
Be able to discuss investigations with colleagues and to order them appropriately	CbD, mini-CEX, MSF	1,2,3
Behaviours		
Understand the importance of working with other health care professionals and team working	CbD, mini-CEX, MSF	1,3
Show a willingness to provide explanations to the patient as to the rationale for investigations, and possible unwanted effects	mini-CEX, MSF, PS	1,2,3,4

Treatment (Therapeutics)

To be able to carry out specialist assessment of patients by means of history taking, physical examination and use of relevant investigations

To implement appropriate treatment, keep accurate records and communicate findings effectively

Knowledge	Assessment Methods	GMP
Know the scientific theory relating to the pharmacology and the pathophysiology of pain	CbD, mini-CEX	1
Skills		
Be able to accurately assess the patients needs	CbD, mini-CEX	1
Be able to initiate the appropriate prescription of analgesia, blood products and medication	CbD, mini-CEX	1,2
Be able to manage transfusion reactions and side-effects	CbD	1,2
Behaviours		
Show appropriate attitudes towards patients and their symptoms and be conscious of religious or other philosophical contexts, particularly	CbD, mini-CEX, PS	1,2,3,4

in the arena of blood products		
Clearly and openly explain treatments and the side effects of drugs	CbD, mini-CEX, PS	1,2,3,

Notekeeping and Correspondence

To be able to carry out specialist assessment of patients by means of history taking, physical examination and use of relevant investigations

To implement appropriate treatment, keep accurate records and communicate findings effectively

Knowledge	Assessment Methods	GMP
Define the structure, function and legal implications of medical records and medico-legal reports	CbD, mini-CEX	1
Know the legal and professional obligations pertaining to confidentiality in record keeping and correspondence	CbD, mini-CEX	1
Skills		
Date and sign all records	mini-CEX	1
Record concisely, accurately, confidentially and legibly the appropriate elements of the history, examination, results of investigations, differential diagnosis and management plan	CbD, mini-CEX	1
Document discussions with patients or relatives in the notes	CbD, mini-CEX	1,3,4
Be able to write discharge summaries, outpatient letters and medico-legal reports	CbD	1,2,3,4
Behaviours		
Appreciate the importance of timely dictation, cost effective use of medical secretaries and the growing use of electronic communication	CbD, MSF	1,3
Be aware of the need for prompt and accurate communication with primary care and other agencies	CbD, MSF	1,3
Show courtesy towards medical secretaries and clerical staff	MSF	1,3

Managing Chronic Disease

To be able to carry out specialist assessment and treatment of patients with chronic disease and to demonstrate effective management of chronic disease states

Knowledge	Assessment Methods	GMP
Define the clinical presentation and natural history of patients with chronic disease	CbD, mini-CEX	1
Define the role of rehabilitation services, pain control and palliative care	CbD, mini-CEX	1,3
Define the concept of quality of life and how it can be measured	CbD	1,2,3,4
Skills		
Maintain hope whilst setting long term realistic goals	mini-CEX, PS	1
Develop long term management plans	CbD, mini-CEX	1
Act as patient advocate in negotiations with support services	CbD, mini-CEX	1,3
Have skills in palliative care including care of the dying	CbD, mini-CEX	1

Behaviours		
Treat each patient as an individual	CbD, mini-CEX, PS	1,3,4
Develop and sustain supportive relationships with patients with chronic disease	mini-CEX, PS	1,2,3,4
Appreciate the impact of chronic disease on patients and their relatives	CbD, mini-CEX, PS	1,2,3,4
Appreciate the importance of co-operation with primary care	CbD, mini-CEX	1,2,3,

Time Management

To be able to manage time efficiently and deal with clinical problems effectively		
Knowledge	**Assessment Methods**	**GMP**
Know which patients and tasks take priority	CbD, mini-CEX, MSF	1,2,
Skills		
Start with the most important tasks	CbD, mini-CEX, MSF	1
Work more efficiently as clinical skills develop	CbD, mini-CEX, MSF	1
Anticipate workload and plan appropriately	CbD, MSF	1,3
Recognise when you are falling behind and re-prioritise or call for help	DOPS, MSF	1,3,4
Behaviours		
Recognise the importance of punctuality	mini-CEX, MSF	1,3
Have realistic expectations of tasks to be completed by self and others	MSF	1,3
Be willing to consult and work as part of a team	MSF	1,3

Decision Making

To be able to manage time efficiently and deal with clinical problems effectively		
Knowledge	**Assessment Methods**	**GMP**
Understand clinical priorities for investigation and management	CbD, mini-CEX, MSF	1
Skills		
Analyse and manage clinical problems	mini-CEX, MSF	1
Behaviours		
Be flexible and willing to change in the light of changing conditions	MSF	1
Be willing to ask for help	CbD, MSF	1,3

2. Communication Skills

Communication within a Consultation

To demonstrate effective communication with children and their parents		
Knowledge	**Assessment Methods**	**GMP**
Know how to structure the interview to identify the patient's: • Concerns and priorities • Problem list • Expectations • Understanding • Acceptance	CbD	1,2,3
Skills		
Listen	mini-CEX, MSF, PS	1,3
Use open questions followed by appropriate closed questions	mini-CEX, MSF, PS	1,3
Avoid jargon and use familiar language	mini-CEX, MSF, PS	1,3
Be able to communicate with patients whose first language may not be English in a manner that they understand and use interpreters when appropriate	mini-CEX, MSF, PS	1,3
Be able to communicate with children in a manner appropriate to their age and level of understanding	mini-CEX, MSF, PS	1,3,4
Give clear information and feedback to patients and share information with relatives when appropriate	DOPS, mini-CEX, MSF, PS	1,3
Reassure 'worried well' patients and parents	mini-CEX, MSF, PS	1,3,4
Behaviours		
Demonstrate an understanding of the need for: involving patients in decisions offering choices respecting patients views involving parents in the consultation process whilst focusing on the needs of the child	mini-CEX, MSF, PS	1,2,3,4
Understand that dress and appearance should be appropriate to the clinical situation and patient sensibility	mini-CEX	1,3,4

Breaking Bad News

To demonstrate effective communication with patients		
Knowledge	**Assessment Methods**	**GMP**
Know how to structure the interview and where it should take place	CbD, DOPS, mini-CEX	1,3
Be aware of the normal bereavement process and behaviour	CbD	1,3
Know the legal and practical matters that need to be addressed following death	CbD	1,3,4
Have awareness of organ donation procedures and role of local	CbD	1

transplant coordinators		
Skills		
Be able to break bad news in steps appropriate to the understanding of the individual and support distress	DOPS, mini-CEX	1,3,4
Avoid jargon and use familiar language	CbD, mini-CEX, MSF, PS	1,3
Encourage questions	DOPS, mini-CEX, PS	1,3
Address questions of post-mortem and organ donation sensitively	CbD	1,3
Maintain appropriate hope whilst avoiding inappropriate optimism	CbD, DOPS, mini-CEX	1,3,4
Behaviours		
Act with empathy, honesty and sensitivity	DOPS, mini-CEX, PS	1,3,4
Cooperate with other members of staff involved in bereavement counselling	CbD, MSF	1,3
Appreciate the importance of informing primary care quickly of bad news and bereavement to ensure coordinated support	mini-CEX-CEX, CbD	1,2,3

Complaints

To demonstrate effective communication with patients		
Knowledge	**Assessment Methods**	**GMP**
Be aware of the local complaints procedures	CbD	1
Be aware of systems of independent review	CbD	1
Know the role of the hospital risk management team and the claims department	CbD	1
Skills		
Demonstrate understanding and skill in managing dissatisfied patients and relatives	DOPS, mini-CEX, MSF	1,2,3,4
Anticipate potential problems	mini-CEX-CEX, DOPS	1,2,3,4
Deal with minor complaints with appropriate explanation and by taking practical measures to rectify problems	CbD, DOPS, mini-CEX	1,2,3,4
Make enquiries about earlier contact dissatisfied patients or relatives may have had with other members of staff and pending legal action before dealing with serious complaints	CbD, DOPS, mini-CEX	1,2,3,4
Behaviours		
Act promptly and with honesty and sensitivity	DOPS, mini-CEX, MSF, PS	1,2,3,4
Be prepared to accept responsibility	mini-CEX, MSF	1,2,3,4
Appreciate the need for timely explanation of the problem and ensure that the patient or relatives understand the events that lead to the complaint	CbD, DOPS, mini-CEX	1,2,3,4
Avoid allocation of blame	CbD, DOPS, MSF	1,2,3,4

Communication with Colleagues

To demonstrate effective communication with medical colleagues and allied professionals		
Knowledge	**Assessment Methods**	**GMP**
Know how to write a problem orientated letter and discharge summary	CbD	1,3
Know when to telephone a GP	CbD	1,3
Skills		
Select an appropriate method of communication (telephone, email, letter)	CbD	1,3
Use appropriate language	DOPS, mini-CEX, MSF, PS	1,3,4
Communicate with all members of staff, including non-medical staff, to achieve effective coordination and delivery of patient care	DOPS, MSF	1,2,3,4
Behaviours		
Be prompt and respond courteously and fairly	DOPS, MSF	1,2,3,4

3. Maintaining Good Medical Practice

Life-Long Learning

To instil the habit of life-long learning		
Knowledge	**Assessment Methods**	**GMP**
Define continuing professional development	CbD	1
Skills		
Institute routines for personal life-long learning	CbD	1,2
Recognise and use learning opportunities	CbD, DOPS, mini-CEX	1,2
Use the potential of study leave to keep up to date	CbD	1,2
Behaviours		
Be self motivated and willing to learn	CbD, MSF	1,2,
Show willingness to learn from colleagues	CbD, MSF	1,2,3
Be willing to accept criticism	CbD, MSF	1,2,3

4. Maintaining Trust - Professional Behaviour

Continuity of Care

To ensure that the trainee is able to act in a professional manner at all times		
Knowledge	**Assessment Methods**	**GMP**
Understand the relevance of continuity of care.	CbD, mini-CEX	1,2,3,4
Skills		
Ensure satisfactory completion of reasonable tasks at the end of the shift/day	DOPS, MSF	1,2,3,4
Ensure adequate handover with appropriate documentation	MSF	1,2,3,4
Make adequate arrangements to cover leave	MSF	1,2,3,4
Ensure arrangements are in place to continue patient care after discharge	mini-CEX	1,2,3,4
Behaviours		
Recognise the importance of attention to detail	MSF	1,2,3,4

Doctor-Patient Relationship

To ensure that the trainee is able to act in a professional manner at all times		
Knowledge	**Assessment Methods**	**GMP**
Understand all aspects of the professional relationship	CbD, MSF	1,2,3,4
Establish the limiting boundaries surrounding the consultation	CbD	1,2,3,4
Skills		
Help the patient appreciate the importance of cooperation between patient and doctor	DOPS, mini-CEX	1,2,3,4
Develop a relationship that facilitates solutions to patient's problems	CbD, mini-CEX, PS	1,2,3,4
Deal appropriately with behaviour falling outside the boundary of the agreed doctor patient relationship. in patients, e.g. aggression, violence, sexual harassment	DOPS, mini-CEX, MSF	1,2,3,4
Behaviours		
Adopt a non-discriminatory attitude to all patients and recognise their needs as individuals	DOPS, mini-CEX, PS	1,2,3,4
Seek to identify the health care belief of the patient	DOPS, mini-CEX	1,2,3,4
Acknowledge patient rights to accept or reject advice	DOPS, mini-CEX, PS	1,2,3,4
Secure equity of access to health care resources for minority groups	CbD	1,2,3,4

Recognise Own Limitations

To ensure that the trainee is able to act in a professional manner at all times		
Knowledge	**Assessment Methods**	**GMP**
Know the extent of one's own limitations and know when to ask for advice	CbD, DOPS, mini-CEX, MSF	1,2,3,4
Skills		
Recognise situations where the problem faced is beyond the trainees individual competence to deal with and seek appropriate help	CbD	1,2,3,4
Behaviours		
Be willing to consult others and to admit mistakes	CbD, DOPS, mini-CEX, MSF	1,2,3,4

Stress

To ensure that the trainee is able to act in a professional manner at all times		
Knowledge	**Assessment Methods**	**GMP**
Know the effects of stress	CbD	1,2,3,4
Have knowledge of the support facilities for doctors	CbD	1,2,3,4
Skills		
Develop appropriate coping mechanisms for stress and ability to seek help if appropriate	CbD	1,2,3,4
Behaviours		
Recognise the manifestations of stress in self and others	CbD	1,2,3,4

Relevance of Outside Bodies

To ensure that the trainee is able to act in a professional manner at all times		
Knowledge	**Assessment Methods**	**GMP**
Have an understanding of the relevance to professional life of: • The Royal Colleges • GMC • Postgraduate Dean • Defence unions • BMA • Specialist Societies	CbD	1,2,4
Skills		
Recognise situations when it is appropriate to involve these bodies/individuals	CbD	1,2,3,4
Know and adhere to the GMC code of conduct (e.g. in respect of consent, confidentiality and the doctor-patient relationship)	CbD	1,2,3,4
Behaviours		

Be open to constructive criticism	CbD, DOPS, mini-CEX, MSF	1,2,3,4
Accept professional regulation	CbD, MSF	1,2,3,4

Personal Health

To ensure that the trainee is able to act in a professional manner at all times		
Knowledge	**Assessment Methods**	**GMP**
Know the role of occupational health services	CbD, mini-CEX	1,2,4
Know the doctors responsibility to take action when his/her personal health is affecting patient care	CbD	1,2,3,4
Know not to treat oneself or one's family	CbD	1,2,4
Skills		
Recognise when personal health takes priority over work pressures	CbD, MSF	1,2,3,4
Take time off when necessary	CbD, MSF	1,2,4
Behaviours		
Recognise personal health as an important issue	CbD, MSF	1,2,4

4. Maintaining Trust - Ethics and Legal Issues

Informed Consent

To ensure that the trainee can cope with ethical and legal issues that may arise in clinical practice

Knowledge	Assessment Methods	GMP
Know the process for gaining informed consent	DOPS	1,4
Understand appropriateness of consent to post-mortem	CbD	1,4
Know how to gain consent for a research project	CbD	1,4
Know the issues and regulations regarding consent from children	CbD	1,4
Skills		
Give information in a manner patients understand and use appropriate written material	DOPS, mini-CEX, MSF, PS	1,4
Be able to gain informed consent from patients	DOPS	1,4
Be able to assess competence to consent for a procedure in adolescent patients	Cbd, mini-CEX-CEX	1,4
Behaviours		
Consider the patient's needs as an individual	CbD, DOPS, mini-CEX, PS	1,4

Confidentiality

To ensure that the trainee can cope with ethical and legal issues that may arise in clinical practice

Knowledge	Assessment Methods	GMP
Be aware of strategies to ensure confidentiality	CbD, DOPS, mini-CEX	1,4
Be aware of situations when confidentiality might be broken	CbD, DOPS, mini-CEX	1,4
Skills		
Use and share all information appropriately	CbD, DOPS, mini-CEX	1,3,4
Avoid discussing one patient in front of another	DOPS, mini-CEX	1,3,4
Seek patients permission where appropriate before disclosing information	CbD, mini-CEX	1,3,4
Behaviours		
Respect the right to confidentiality	CbD, DOPS, mini-CEX	1,4

Legal Issues

Legal issues relating to:

- **Death certification**
- **Advance directives and living wills**
- **The role of the coroner or procurator fiscal**
- **Mental illness**
- **DVLA**
- **Criminal proceedings**
- **Civil litigation**

Knowledge	Assessment Methods	GMP
Know the legal responsibilities involved in completing death certificates	CbD	1,4
Know the legal status of advance directives and living wills	CbD	1,4
Know the types of deaths that should be referred to the coroner or procurator fiscal	CbD	1,4
Know the indications for section under the Mental Health Act	CbD	1,4
Know the conditions that require patients to report to the DVLA	CbD	1,4
Know a doctors responsibilities in serious criminal matters	CbD	1,4
Be aware of hospital risk management strategies and how they are implemented	CbD	1,2,3,4
Be aware of the fundamental steps in defending a claim	CbD	1,4
Skills		
Be able to complete death certificates	CbD, mini-CEX	1,4
Check whether the patient has an advance directive or living will	CbD, mini-CEX	1,4
Liaise with the coroner or procurator fiscal	CbD, mini-CEX	1,4
Be able to obtain suitable evidence in criminal matters or know whom to consult if in doubt	CbD, mini-CEX	1,4
Behaviours		
Show attention to detail and recognise time pressures	CbD, DOPS, mini-CEX, MSF	1,4
Respect advance directives and living wills	CbD, mini-CEX	1,4
Recognise the importance of the hospital risk management team and legal team in helping to manage legal issues, particularly those that may potentially result in litigation	CbD	1,2,3,4

Legal Issues Relevant to Children

Knowledge	Assessment Methods	GMP
Know the signs of physical, emotional and sexual abuse and how to initiate further investigation of child protection issues	CbD	1,2,3,4
Know the indications for making a child a ward of court	CbD	1,2,3,4
Know the legal issues relevant to particular religious groups (e.g. Jehovah's witness patients)	CbD, DOPS, mini-CEX	1,2,3,4
Know the issues and regulations regarding consent from children	CbD	1,4
Skills		
Identify child protection issues and refer appropriately for experienced paediatric assessment	CbD	1,2,3,4
Determine who holds parental responsibility and obtain consent from the correct party when a child is adopted, fostered, under the care of social services or is cared for by family other than the parents	DOPS	1,2,3,4
Behaviours		
Be active in promoting the best interests of the child, but balance this with respect for the wishes of the parents and family	CbD, PS	1,2,3,4
Promote cooperative decision making with a patient's family but recognise when the best interests of the child require legal action	CbD, DOPS, mini-CEX	1,2,3,4

4. Maintaining Trust - Patient Education and Disease Prevention

Educating Patients about Disease Investigations Therapy

To ensure the trainee can provide effective information to patients and their families regarding health promotion and disease prevention

Knowledge	Assessment Methods	GMP
Have a thorough knowledge of investigations and procedures including possible alternatives and choices	CbD, DOPS, mini-CEX	1,4
Be aware of strategies to improve adherence to therapies	CbD, mini-CEX	1,4
Skills		
Give information to patients in a clear manner that they can understand	DOPS, mini-CEX, MSF, PS	1,3,4
Provide written information if possible	DOPS, mini-CEX	1,3,4
Encourage questions	DOPS, mini-CEX, PS	1,3,4
Negotiate individual treatment plans including action to be taken if a patient deteriorates or improves	CbD, DOPS, mini-CEX	1,3,4
Behaviours		
Consider involving patients in developing mutually acceptable investigation plans	CbD, mini-CEX	1,3,4
Encourage patients to access further information and patient support groups	CbD, DOPS, mini-CEX	1,3,4

Environmental and Lifestyle Risk Factors

To ensure the trainee can provide effective information to patients and their families regarding health promotion and disease prevention

Knowledge	Assessment Methods	GMP
Understand risk factors for disease including: • diet • exercise • social deprivation • occupation • substance abuse • behaviour	CbD, mini-CEX	1,4
Skills		
Advise on lifestyle changes	CbD, DOPS, mini-CEX	1,2,3,4
Involve other health care workers as appropriate	CbD, DOPS, mini-CEX	1,2,3,4
Behaviours		
Suppress any display of personal judgment	CbD, DOPS, mini-CEX	1,4

Smoking

To ensure the trainee can provide effective information to patients and their families regarding health promotion and disease prevention		
Knowledge	**Assessment Methods**	**GMP**
Know: The effects of smoking on health with particular relevance to congenital heart disease The implications of addiction Smoking cessation strategies	CbD	1,4
Skills		
Be able to advise on smoking cessation and supportive measures	CbD, mini-CEX	1,2,3,4
Identify 'ready to quit' smokers	CbD	1,2,3,4
Behaviours		
Consider the importance of support during smoking cessation.	CbD	1,2,3,4

Alcohol

To ensure the trainee can provide effective information to patients and their families regarding health promotion and disease prevention		
Knowledge	**Assessment Methods**	**GMP**
Understand the effects of alcohol on health and psychosocial well-being	CbD	1,4
Know of local support groups and agencies	CbD	1,4
The effects of alcohol on health with particular relevance to congenital heart disease	CbD	1,4
Skills		
Advise on drinking cessation.	CbD, mini-CEX	1,2,3,4
Behaviours		
Suggest patient support groups as appropriate	CbD, mini-CEX	1,2,3,4
Suppress any display of personal judgement	CbD, mini-CEX	1,2,3,4

Illicit Drugs

To ensure the trainee can provide effective information to patients and their families regarding health promotion and disease prevention		
Knowledge	**Assessment Methods**	**GMP**
Know the effects of common illicitly taken drugs on health with particular relevance to congenital heart disease	CbD	1,4
Know Legislation in respect of drug abuse	CbD	1,4
Know what to do if a patient takes an overdose of drugs	CbD	1,4
Know the role of support services	CbD	1,2,3,4
Skills		

Be able to use detoxification services	CbD	1,3,4
Understand prevention policies and liaise with psychiatric services	CbD	1,2,3,4
Deal with other prevention and liaison services	CbD	1,2,3,4
Behaviours		
Provide sympathetic help	CbD, mini-CEX, MSF, PS	1,2,3,4
Suppress any display of personal judgement	CbD, mini-CEX, MSF, PS	1,2,3,4

Epidemiology and Screening

To ensure the trainee can provide effective information to patients and their families regarding health promotion and disease prevention

Knowledge	Assessment Methods	GMP
Know the methods of data collection and their limitations	CbD	1,4
Know diseases that are notifiable	CbD	1,4
Know principles of 1^{o} and 2^{o} prevention and screening	CbD	1,4
Skills		
Assess an individual patient's risk factors	CbD, mini-CEX	1,4
Encourage participation in appropriate disease prevention or screening programmes	CbD, mini-CEX	1,2,3,4
Behaviours		
Consider the positive and negative aspects of prevention	CbD	1,2,3,4
Respect patient choice	CbD, mini-CEX, PS	1,2,3,4
Recognise the importance of patient confidentiality	CbD, mini-CEX	1,2,3,4

5. Working with Colleagues

Interactions with Colleagues

To demonstrate good working relationships with colleagues in interactions between members of the Medical Team, Medical and Surgical Specialties, Hospital and GP, Hospital and other Agencies (eg social services)

Knowledge	Assessment Methods	GMP
Understand the roles and responsibilities of: • Other members of the team • Referring physicians • Primary care doctors • Non-medical professionals	CbD, DOPS, mini-CEX, MSF	1,2,3,
Know the role of surgery and its limitations	CbD, DOPS, mini-CEX	1,2,3
Know the roles of other clinical specialties and their limitations	CbD, DOPS, mini-CEX, MSF	1,2,3
Skills		
Show leadership, delegate appropriately and supervise safely	CbD, MSF	1,2,3,4
Be able to communicate effectively	CbD, mini-CEX, MSF	1,2,3,4
Handover safely	MSF	1,2,3,4
Seek advice if unsure	CbD, DOPS, mini-CEX	1,2,3,4
Recognise when input from another specialty is required for individual patients	CbD, DOPS, mini-CEX	1,2,3,4
Be able to work effectively with GPs, other medical and surgical specialists and other health care professionals	mini-CEX, MSF	1,2,3,4
Behaviours		
Respect colleagues, including non- medical professionals	MSF	1,2,3,4
Show respect for others opinions and recognise good advice	MSF	1,2,3,4
Work co-operatively	MSF	1,2,3,4
Recognise own limitations	MSF	1,2,3,4

6. Teamwork and Leadership Skills

Effective Teamwork and Leadership Skills

To ensure that the trainee can work effectively within a clinical team and has the ability to lead the team

Knowledge	Assessment Methods	GMP
Know the principles of effective teamwork	CbD	1,2,3,4
Know the roles and responsibilities of each team member	CbD	1,2,3,4
Skills		
Be conscientious and work constructively	MSF	1,2,3,4
Perceive the need for action and initiate that action	DOPS, mini-CEX, MSF	1,2,3,4
Ensure colleagues understand the individual roles and responsibilities of each team member	DOPS, mini-CEX, MSF	1,2,3,4
Develop skills in: Setting objectives • Lateral thinking • Planning • Organising • Motivating • Negotiation	CbD, DOPS, mini-CEX, MSF	1,2,3,4
Enable individuals, groups and agencies to implement plans and make decisions	MSF	1,3
Assessment and appraisal of more junior clinical colleagues or students.	MSF	1, 3
Build and maintain relationships by listening, supporting others, gaining trust and showing understanding.	MSF	3
Shown willingness to act as a leader, mentor, educator and role model.	MSF	3
Behaviours		
Recognise your own limitations	CbD, DOPS, mini-CEX, MSF	1,2,3,4
Respect the skills and contribution of colleagues	CbD, DOPS, mini-CEX, MSF	1,2,3,4
Demonstrate enthusiasm, integrity, courage of convictions, imagination, determination, energy and develop professional credibility	CbD, DOPS, mini-CEX, MSF, PS	1,2,4
Showing recognition of a team approach, respecting colleagues, including non-medical professionals	CbD, DOPS, mini-CEX, MSF	1,3

7. Teaching and Educational Supervision

Teaching

To ensure the trainee can provide effective teaching, assessment and appraisal		
Knowledge	**Assessment Methods**	**GMP**
Know: Adult learning principles Varied teaching strategies Varied learning styles How to identify learner needs How to structure a teaching activity Principles of evaluation	CbD, MSF	1,3
Skills		
Facilitate learning process	CbD, MSF	1,3
Identify learning outcomes	CbD	1
Construct educational objectives	CbD	1
Design and deliver an effective teaching event	CbD, MSF	1
Communicate effectively with the learners	MSF, TO	1,3
Use effective questioning techniques	MSF,TO	1,3
Teach large and small groups effectively	MSF,TO	1,3
Select and use appropriate teaching resources	CbD, MSF	1
Give constructive effective feedback	MSF	1,3
Evaluate programmes and events	CbD	1,2
Use different media for teaching that are appropriate to the teaching setting	MSF,TO	1,2,3
Behaviours		
Demonstrate a willingness and enthusiasm to teach	MSF	1,4
Show respect for the learner	MSF	1,4
Demonstrate a professional attitude towards teaching	MSF	1,4
Show commitment to teach	MSF	1,4
Demonstrate a learner centred approach to teaching	MSF	1,4

Assessment

To ensure the trainee can provide effective teaching, assessment and appraisal		
Knowledge	**Assessment Methods**	**GMP**
Know the principles of assessment	CbD	1
Know different assessment methods	CbD	1
Define formative and summative assessment	CbD	1

Skills		
Use appropriate assessment methods	CbD	1
Give constructive, effective feedback	CbD, MSF	1,3
Behaviours		
Be honest and objective when assessing performance	MSF	1,4

Appraisal

To ensure the trainee can provide effective teaching, assessment and appraisal		
Knowledge	**Assessment Methods**	**GMP**
Know the principles of appraisal	CbD	1
Know the structure of the appraisal interview	CbD	1
Skills		
Conduct effective appraisals	CbD	1,3
Behaviours		
Show respect for the person being appraised	CbD	1,4

8. Research

Analysing Published Research and Carrying Out a Research Project

To demonstrate a thorough knowledge of research methodology and an ability to analyse published research

To ensure the trainee can successfully conduct a research project from planning to publication

Knowledge	Assessment Methods	GMP
Know: The principles of research ethics When and how to obtain consent How to design a research study How to seek funding How to use appropriate statistical methods How to write a scientific paper	CbD	1
Skills		
Be able to undertake systematic critical review of scientific literature	CbD	1
Have good written and verbal presentation skills	CbD, MSF	1,3
Be able to: Frame questions to be answered by a research project Develop protocols and methods for research Use databases Accurately analyse data Write a scientific paper	CbD	1,2
Behaviours		
Demonstrate curiosity and a critical spirit of enquiry	CbD, DOPS, mini-CEX	1,4
Ensure patient confidentiality	CbD, DOPS, mini-CEX	1,4
Appreciate the importance of ethical approval and patient consent for clinical research	CbD	1,4
Humility	CbD, DOPS, mini-CEX, MSF, PS	1,4

Clinical Governance

To demonstrate an understanding of the context, meaning and implementation of clinical governance

Knowledge	Assessment Methods	GMP
Define clinical governance	CbD	1
Understand the role and importance of the following in clinical governance: Research and Development Clinical effectiveness Complaints Procedures	CbD, DOPS, mini-CEX	1,2

Risk management Evidence based practice Medical and clinical audit Guidelines and integrated care pathways		
Understand the benefits a patient might reasonably expect from clinical governance	CbD, DOPS, mini-CEX	1,2
Know the organisational framework for clinical governance at local, health authority and national levels	CbD	1,2
Skills		
Actively partake in clinical governance	CbD	1,2,3,4
Be active in research and development	CbD	1,2,3,4
Aim for clinical effectiveness (best practice) at all times	CbD, mini-CEX	1,2,3,4
Be able to handle and deal with complaints in a focused and constructive manner	CbD	1,2,3,4
Report and investigate critical incidents	CbD	1,2,3,4
Take appropriate action if you suspect you or a colleague may not be fit to practice	CbD	1,2,3,4
Educate self, colleagues and other health care professionals	CbD	1,2,3,4
Behaviours		
Make the care of your patient your first concern	CbD, DOPS, mini-CEX	1,4
Respect patients privacy, dignity and confidentiality	CbD, DOPS, mini-CEX	1,4
Help to create an environment where mistakes and mismanagement of patients can be openly discussed and learned from	CbD	1,2,3,4
Be prepared to learn from mistakes, errors and complaints	CbD, DOPS, mini-CEX	1,4
Recognise the importance of team work	CbD, DOPS, mini-CEX, MSF	1,2,3,4
Share best practice with others	CbD	1,2,3,4
Show a capacity to be critical of your own performance	MSF	1,2,3,4

Risk Management

To demonstrate an understanding of the concept of managing risk		
Knowledge	**Assessment Methods**	**GMP**
Know the principles of risk management	CbD	1
Know the role of the hospital risk management team	CbD	1
Be aware of the hospitals strategy and policy on ensuring safety in clinical care	CbD	1
Skills		
Report any unexplained occurrence involving death or serious injury (physical or psychological)	CbD	1,2,3,4

Report “near miss” events that involved a risk of death or serious injury	CbD	1,2,3,4
When there are adverse events or complaints, liaise with the hospitals risk management team	CbD	1,2,3,4
In cases of error ensure that there is adequate contemporaneous documentation	CbD	1,2,3,4
Warn patients of the complications and side effects of treatments and procedures so that they are prepared for adverse outcomes	CbD	1,2,3,4
Behaviours		
Be alert to the conduct of individuals and factors in the organisation of patient care that may give rise to compromise in the quality of care	CbD	1,2,3,4
Learn from adverse events	CbD, MSF	1,2,4
Be truthful and to admit error to patients, relatives and colleagues	CbD, MSF, PS	1,2,3,4
Recognise the importance of adequate notekeeping and communication	CbD, DOPS, mini-CEX	1,2,3,4
Respect the patients right to participate in decisions on their medical care	CbD, DOPS, mini-CEX, PS	1,3,4

Evidence-Based Medicine

To demonstrate an understanding of using evidence to guide clinical management		
Knowledge	**Assessment Methods**	**GMP**
Understand the principles of evidence based medicine	CbD	1
Know the type of evidence that may be used	CbD	1
Know the types of clinical trial design	CbD	1
Skills		
Be able to critically appraise evidence	CbD	1
Be competent in the use of databases, libraries and the internet	CbD	1
Be able to discuss the relevance of evidence with individual patients	CbD	1,2,3
Use evidence based medicine in clinical practice	CbD	1,2,3,4
Behaviours		
Be keen to apply evidence based medicine to patient care	CbD	1,2,3,4

Audit

To demonstrate an understanding of the importance of and performance of clinical audit		
Knowledge	**Assessment Methods**	**GMP**
Know the relevance of audit to clinical governance and how it may benefit patient care	CbD, AA	1,2
Understand the audit cycle	CbD, AA	1,2
Know how to access data sources and how to ensure data confidentiality	CbD, AA	1,2,3
Skills		

Be able to undertake an audit project and complete the audit cycle	CbD, AA	1,2,3,4
Behaviours		
Be an enthusiastic participant in on-going audit	CbD, AA	1,2,4

Guidelines and Integrated Care Pathways

To demonstrate an understanding of the usefulness and limitations of guidelines		
Knowledge	**Assessment Methods**	**GMP**
Know the advantages and disadvantages of guidelines	CbD	1,2
Know methods of determining best practice	CbD	1,2
Skills		
Show ability to utilise guidelines	CbD	1,2,3,4
Be involved in generating, evaluating, reviewing and updating guidelines and integrated care pathways	CbD	1,2,3,4
Behaviours		
Show a willingness to use guidelines when appropriate	CbD	1,2,4
Show regard for individual patient needs when using guidelines	CbD	1,2,3,4

9. Structure of the NHS and Principles of Management

The Structure of the NHS, Principle of Management

To demonstrate knowledge of the principles of management and the structure and organisation of the NHS

Knowledge	Assessment Methods	GMP
Know the structure of the NHS, primary care groups, Trusts and Hospital Trusts	CbD	1
Know the local Trusts structure including Chief Executives, Medical Directors, Clinical Directors and others	CbD	1
Know the role of postgraduate deaneries, specialist societies, the Royal Colleges and the General Medical Council	CbD	1
Understand finance issues in general in the Health Service, especially budgetary management	CbD	1
Know the appointments procedures and the importance of equal opportunities	CbD	1
Know of Central Government health regulatory agencies (e.g. NICE, CHI, NCAA)	CbD	1
Skills		
Develop skills in managing change and managing people	CbD	1,3
Develop techniques for interviewing performance reviews	CbD	1,3
Be able to build a business plan	CbD	1,2,3
Behaviours		
Show an awareness of equity in health care access and delivery	CbD	1,4
Demonstrate an understanding of the importance of a health service for the population	CbD	1,4
Show respect for others, ensuring equal opportunities	CbD, MSF, PS	1,4

10. Information Use and Management

Health Information – The Use of Information Technology for Patient Care and Personal Development

To demonstrate competence in managing and using health information and information technology

Knowledge	Assessment Methods	GMP
Know how to retrieve and utilise data recorded in clinical systems	CbD	1
Demonstrate an understanding of the range of possible uses for clinical data and information	CbD, DOPS	1
Appreciate the dangers and benefits of aggregating clinical data	CbD	1
Know the main responsibilities and liabilities in the UK and Europe pertaining to confidentiality	CbD	1
Know main local and national projects and initiatives in information technology and their applications	CbD	1
Define the stages of evaluation that new technology needs to go through	CbD	1
Skills		
Demonstrate competent use of database, word processing and statistics programmes	CbD, DOPS, mini-CEX	1
Be able to undertake searches and access web sites and health related databases	CbD	1
Be able to critically appraise available software	CbD	1
Implement the principles of confidentiality in clinical practice in the context of information technology	CbD, DOPS, mini-CEX	1,3,4
Behaviours		
Show willingness to make maximum use of information technology in patient consultations	CbD, DOPS, mini-CEX	1,3,4
Demonstrate appropriate techniques for sharing information on computer with the patient in a constructive manner	CbD, DOPS, mini-CEX	1,2,3,4
Adopt a pro-active and enquiring attitude to new technology	CbD	1,4

11. Cross-Specialty Skills - Admissions and Discharges

Managing Acute Paediatric and Medical Problems When On Call

To be able to safely manage acute general medical problems

Knowledge	Assessment Methods	GMP
Know:		
The medical indications for urgent investigation and therapy	CbD, DOPS, mini-CEX, MSF	1
The skills and capabilities of members of the 'on-take' team	CbD, DOPS, mini-CEX, MSF	1,2,3
When to seek help or refer to other specialties	CbD, DOPS, mini-CEX, MSF	1,2,3
Support available in the community	CbD, DOPS, mini-CEX, MSF	1,2,3
Skills		
Receive referrals appropriately	CbD, mini-CEX	1,2,3,4
Be able to prioritise	CbD, DOPS, mini-CEX	1,2,3,4
Delegate effectively and safely	CbD, mini-CEX	1,2,3,4
Interact effectively with other health care professionals	CbD, mini-CEX, MSF	1,2,3,4
Keep patients and relatives informed	CbD, MSF, PS	1,2,3,4
Keep an accurate patient list	CbD	1,4
Handover safely with appropriate documentation	CbD	1,2,3,4
Behaviours		
Handle acutely ill patients sympathetically	CbD, mini-CEX, PS	1,2,3,4
Cope with stress	CbD, DOPS, mini-CEX, MSF	1,2,4
Be aware of the pressures on other members of staff	CbD, DOPS, mini-CEX, MSF	1,2,3,4

12. Cross-Specialty Skills - Discharge Planning

Discharge Planning

To be able to plan difficult discharges for patients

Knowledge	Assessment Methods	GMP
Know the impact of physical problems on activities of daily living	CbD	1
Know the roles and skills of members of the multidisciplinary team including nurses, occupational therapists, physiotherapists, speech therapists, psychologists, discharge coordinators and social workers	CbD, MSF	1,3
Understand the impact of unnecessary hospitalisation	CbD, mini-CEX	1,2
Know what type of support is available in primary care	CbD, mini-CEX	1,2,3
Skills		
Recognise when in-patient care is not required	CbD, mini-CEX	1,2,
Contribute effectively to discharge planning meetings	CbD, mini-CEX	1,2,3
Liaise and communicate with patient, family and primary care	CbD, DOPS, mini-CEX, PS	1,2,3
Be able to write reports for appropriate bodies	CbD, mini-CEX	1,3
Behaviours		
Display empathy	CbD, DOPS, mini-CEX, PS	1,4
Show an awareness of family dynamics and socio-economic factors influencing success of discharge	CbD, DOPS, mini-CEX, MSF, PS	1,4

12. Cross-Specialty Skills - Resuscitation

Recognise when a patient is critically ill

To be able to recognise critically ill patients, provide advanced paediatric and adult life support and confidently lead a resuscitation team

To be able to use local protocols in deciding when not to resuscitate patients

Knowledge	Assessment Methods	GMP
Know how life threatening emergencies present and how to treat them	APLS/EPLS, CbD, DOPS, mini-CEX	1,2
Skills		
Be able to:		
Rapidly perform an initial assessment	APLS/EPLS, CbD, mini-CEX	1,2
Manage life threatening emergencies	APLS/EPLS, CbD, mini-CEX	1,2
Recognise when to call for help from seniors or other specialties e.g. ICU	APLS/EPLS, CbD, mini-CEX	1,2,3
Behaviours		
Keep calm	APLS/EPLS, CbD, DOPS, mini-CEX, MSF	1,2,4
Recognise priorities	APLS/EPLS, CbD, DOPS, mini-CEX, MSF	1,2,4
Respect the dignity of patients	APLS/EPLS, DOPS, mini-CEX, PS	1,2,4
Keep relatives informed	APLS/EPLS, DOPS, mini-CEX, MSF, PS	1,2,3,4

Advanced Life Support

To be able to provide advanced paediatric and adult life support and confidently lead a resuscitation team

Knowledge	Assessment Methods	GMP
Know advanced life support algorithms	APLS/EPLS	1,2
Know the role and side effects of commonly used anti-arrhythmic and cardiac support drugs	APLS/EPLS	1,2
Skills		
Be able to:		
Establish vascular access in an emergency	APLS/EPLS	1,2
Recognise cardiac arrhythmias	APLS/EPLS	1,2
Perform emergency cardioversion/defibrillation	APLS/EPLS	1,2
Carry out emergency endo-tracheal intubation	APLS/EPLS	1,2

Behaviours		
Display a calm and confident demeanour	APLS/EPLS	1,2,4
Appreciate the ethical and legal aspects of resuscitation	APLS/EPLS	1,2,4

Lead a Cardiac Arrest Team

To be able to provide advanced paediatric and adult life support and confidently lead a resuscitation team

Knowledge	Assessment Methods	GMP
Understand the role and responsibilities of the team leader	CbD, MSF	1,2
Skills		
Demonstrate safe and effective communication and delegation	CbD, MSF	1,2,3
Behaviours		
Be calm and realistic	CbD, MSF	1,2,4

Do Not Resucitate (DNR) Orders

To be able to use local protocols in deciding when not to resuscitate patients

Knowledge	Assessment Methods	GMP
Know local and national protocols for DNR orders	CbD	1,2,
Know the legal and ethical implications of DNR orders	CbD	1,2
Skills		
Be able to explain the consequences of DNR orders with compassion and without giving undue hope	mini-CEX, PS	1,2,3
Behaviours		
Act with empathy and sensitivity	CbD, mini-CEX, MSF, PS	1,2,4
Support patients and their families	MSF, PS	1,2,3,4

12. Cross-Specialty Skills - Nutrition

Nutritional Status

To demonstrate effective management of nutrition		
Knowledge	**Assessment Methods**	**GMP**
Know the impact of disease on nutritional status	CbD, mini-CEX	1
Know the effect of malnutrition on clinical outcomes	CbD, mini-CEX	1
Skills		
Be able to assess nutritional status	CbD, mini-CEX	1
Behaviours		
Recognise cultural and religious issues	CbD, mini-CEX, MSF, PS	1,4

Nutrition Support

To demonstrate effective management of nutrition		
Knowledge	**Assessment Methods**	**GMP**
Know the principles and routes of nutrition support	CbD, mini-CEX	1
Understand the role of nutrition support team (NST) and know when to ask for their assistance	CbD, mini-CEX, MSF	1,3
Know the indications and arrangements necessary for PEG tubes	CbD, mini-CEX	1,3
Skills		
Be able to insert naso-gastric tubes	CbD	1
Be able to obtain central venous access	CbD, DOPS	1
Identify those needing nutrition support or advice and provide appropriate advice	CbD, DOPS, mini-CEX	1,3
Behaviours		
Recognise the skills of others involved in nutrition support e.g. specialist nurses, pharmacists, dieticians	CbD, mini-CEX	1,4

Part 2 – Clinical Learning Objectives

1. Cardiovascular Collapse in Infancy

To be able to carry out specialist assessment and treatment of infants who present with cardiovascular collapse and plan surgery or other intervention when necessary

Knowledge	Assessment Methods	GMP
Know:		
How to distinguish cardiac and non-cardiac causes of cardiovascular collapse	CbD, DOPS, mini-CEX, *	1
The cardiac causes of cardiovascular collapse and likely diagnoses on the basis of the timing of presentation	CbD, mini-CEX, *	1
The natural history, anatomy, physiology and clinical features of cardiac disorders that cause collapse in infancy	CbD, mini-CEX, *	1
The physiology of duct dependent systemic circulation	CbD, DOPS, mini-CEX, *	1
The ECG, CXR and echocardiographic findings in congenital heart disease that presents with collapse in infancy	CbD, DOPS, mini-CEX, *	1
The indications, limitations and risks of invasive and non-invasive investigation in infants that present with collapse	CbD, DOPS, mini-CEX, *	1
Know the angiographic and haemodynamic findings at cardiac catheterisation in congenital heart disease that presents with collapse	CbD, DOPS, mini-CEX, *	1
Know the indications and risks of catheter intervention and surgery in congenital heart disease that presents with collapse	CbD, DOPS, mini-CEX, *	1
Know the impact of cardiovascular collapse on other organs	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to:		
Identify cardiovascular collapse and carry out or direct resuscitation, medical treatment and intensive care	CbD, DOPS, mini-CEX	1,2
Take a relevant history and perform an appropriate examination	CbD, DOPS, mini-CEX	1,3
Interpret ECG, CXR and blood results and appreciate their importance and limitations in reaching a diagnosis	CbD, mini-CEX	1
Use echocardiography to accurately diagnose abnormalities in cardiac structure or function	CbD, DOPS	1
Identify where information is incomplete and plan further investigation either by non-invasive imaging or cardiac catheterisation	CbD, DOPS, mini-CEX	1
Make an accurate anatomical and physiological diagnosis on the basis of the clinical information and investigations	CbD, DOPS, mini-CEX	1
Initiate prostaglandin E where appropriate and know how to monitor its effect and when to alter the dose administered	CbD, mini-CEX	1
Plan and coordinate surgery or catheter intervention where necessary	CbD, DOPS, mini-CEX	1,3
Identify compromise to other organs secondary to collapse and refer to other specialties where necessary	CbD, mini-CEX	1

Provide advice to referring paediatricians in respect of emergency management before transfer to the cardiac centre	CbD, DOPS, mini-CEX	1,3
Counsel parents about the underlying cause of the collapse and give a realistic prognosis	CbD, DOPS, mini-CEX, PS	1,3,4
Outline a treatment plan in terms understood by the parents	CbD, DOPS, mini-CEX, PS	1,3
Plan and participate in outpatient follow-up	CbD, DOPS, mini-CEX	1
Behaviours		
Recognise the role and importance of other members of the cardiac team: paediatric cardiac nurses, paediatric intensive care nurses, intensivists and paediatric cardiac surgeons	CbD, DOPS, mini-CEX, MSF	1,2,3
Appreciate the concerns and anxiety of parents and other family members	CbD, DOPS, mini-CEX, MSF, PS	1,2,3
Recognise and respond appropriately to the urgency of the clinical situation	CbD, DOPS, mini-CEX, MSF	1,2,4

2. Cardiac Failure in Infants and Children

To be able to carry out specialist assessment and treatment of cardiac failure in infants and children and plan surgical intervention when necessary

Knowledge	Assessment Methods	GMP
Understand the physiology of cardiac failure caused by: • Pressure overload • Volume overload • Restriction to inflow • Reduced contractility	CbD, DOPS, mini-CEX, *	1
Understand the physiology of pulmonary oedema	CbD, DOPS, mini-CEX, *	1
Know:		
The clinical features of cardiac failure at different ages, from newborn to adult life	CbD, mini-CEX, *	1
How to distinguish cardiac failure from other causes of increased respiratory effort	CbD, mini-CEX, *	1
The causes of cardiac failure and identify likely diagnoses on the basis of the timing of presentation	CbD, mini-CEX, *	1
The natural history, anatomy, physiology and clinical features of disorders that cause cardiac failure	CbD, mini-CEX, *	1
The ECG, CXR and echocardiographic findings in cardiac disorders that present with cardiac failure	CbD, DOPS, mini-CEX, *	1
The indications, limitations and risks of invasive and non-invasive investigation in children that present with cardiac failure	CbD, DOPS, mini-CEX, *	1
The angiographic and haemodynamic findings at cardiac catheterisation in congenital heart disease that presents with cardiac failure	CbD, DOPS, *	1
The indications, contraindications, action and side-effects of drug treatment for cardiac failure	CbD, DOPS, mini-CEX, *	1

The indications and risks of catheter intervention and surgery in congenital heart disease that presents with cardiac failure	CbD, DOPS, mini-CEX	1
Skills		
Be able to:		
Identify cardiac failure in patients of all ages	CbD, DOPS, mini-CEX	1
Take a relevant history and perform an appropriate examination	mini-CEX	1
Interpret ECG, CXR and blood results and appreciate the importance and limitations of these investigations in diagnosing cardiac failure and elucidating its underlying cause	CbD, DOPS, mini-CEX	1
Use echocardiography to diagnose abnormalities in cardiac structure or function	CbD, DOPS	1
Identify where information is incomplete and plan further investigation either by non-invasive imaging or cardiac catheterisation	CbD, DOPS, mini-CEX	1
Make an accurate anatomical and physiological diagnosis of the cause of cardiac failure on the basis of the clinical information and investigations	mini-CEX	1
Institute appropriate drug therapy for cardiac failure and monitor its success and complications	CbD, mini-CEX	1
Optimise nutrition and manage failure to thrive caused by cardiac failure	CbD, mini-CEX	1
Plan and coordinate surgery or catheter intervention where necessary	CbD, mini-CEX	1,3
Counsel parents about the underlying cause of the cardiac failure, give appropriate advice to parents where cardiac failure is anticipated and give a realistic prognosis	CbD, DOPS, mini-CEX	1,3
Outline a treatment plan in terms understood by the parents	CbD, mini-CEX	1,3
Provide advice to referring paediatricians managing children with cardiac failure	CbD, mini-CEX	1,3
Offer advice and support in respect of schooling and sporting activity	CbD, mini-CEX, PS	1,3
Plan and participate in outpatient follow-up	CbD, mini-CEX	1,3
Behaviours		
Appreciate the concerns and anxiety of parents and other family members	CbD, DOPS, mini-CEX, PS	1,2,3,4
Consider the interaction of symptoms with the child's lifestyle	CbD, mini-CEX	1,2,3,4
Appreciate the role of cardiac nurses and cardiac community nurses in managing chronic cardiac failure	CbD, mini-CEX, MSF	1,2,3,4

3. Cyanosis in the Newborn Period

To be able to carry out specialist assessment and treatment of cyanotic newborn infants and plan surgery or other intervention when necessary

Knowledge	Assessment Methods	GMP
Understand the physiology of cyanosis caused by: • Right heart obstruction with right to left shunting • Parallel circulation	CbD, mini-CEX, *	1

• Common mixing lesions		
Understand the physiology of duct dependent pulmonary circulation	CbD, mini-CEX, *	1
Know:		
How to distinguish cardiac and non-cardiac causes of cyanosis in the newborn period	CbD, DOPS, mini-CEX, *	1
The cardiac causes of cyanosis in the newborn period	CbD, DOPS, mini-CEX, *	1
The natural history, anatomy, physiology and clinical features of congenital heart disease that causes cyanosis in the newborn period	CbD, DOPS, mini-CEX, *	1
The ECG, CXR and echocardiographic findings in congenital heart disease that presents with cyanosis in the newborn period	CbD, DOPS, mini-CEX, *	1
The indications, limitations and risks of invasive and non-invasive investigation in newborns with cyanotic congenital heart disease	CbD, DOPS, mini-CEX, *	1,2
The angiographic and haemodynamic findings at cardiac catheterisation in congenital heart disease that presents with cyanosis in the newborn period	CbD, DOPS, mini-CEX, *	1
The indications and risks of catheter intervention and surgery in congenital heart disease that presents with cyanosis in the newborn period	CbD, DOPS, mini-CEX, *	1,2
Skills		
Be able to:		
Take a relevant history and perform an appropriate examination	mini-CEX	1
Interpret ECG, CXR and blood results and appreciate their importance and limitations in reaching a diagnosis	CbD, DOPS, mini-CEX	1
Use echocardiography to accurately diagnose abnormalities in cardiac structure or function	CbD, DOPS, mini-CEX	1
Identify where information is incomplete and plan further investigation either by non-invasive imaging or cardiac catheterisation	CbD, DOPS, mini-CEX	1
Make an accurate anatomical and physiological diagnosis on the basis of the clinical information and investigations	CbD, DOPS, mini-CEX	1
Initiate prostaglandin E where appropriate and know how to monitor its effect and when to alter the dose administered	CbD, mini-CEX	1
Plan and coordinate surgery or catheter intervention where necessary	CbD, mini-CEX	1,3
Counsel parents and give a realistic prognosis	CbD, DOPS, mini-CEX, MSF, PS	1,3
Outline a treatment plan in terms understood by the parents	CbD, DOPS, mini-CEX, PS	1,3
Provide advice to referring paediatricians in respect of emergency management before transfer to the cardiac centre	CbD, mini-CEX, MSF	1,3
Plan and participate in outpatient follow-up	CbD, mini-CEX	1,3
Behaviours		
Appreciate the concerns and anxiety of parents and other family members	CbD, DOPS, mini-CEX, PS	1,3,4
Recognise and respond appropriately to the urgency of investigation and treatment	CbD, DOPS, mini-CEX, MS	1,3,4

4. Cyanosis Beyond the Newborn Period

To be able to carry out specialist assessment and treatment of cyanotic children presenting after the newborn period and plan surgical or other intervention where necessary

Knowledge	Assessment Methods	GMP
Know:		
How to distinguish cardiac and non-cardiac causes of cyanosis beyond the newborn period	CbD, DOPS, mini-CEX, *	1
The cardiac causes of cyanosis presenting after the newborn period	CbD, DOPS, mini-CEX, *	1
The natural history, anatomy, physiology and clinical features of congenital heart disease that presents with cyanosis after the newborn period	CbD, DOPS, mini-CEX, *	1
The ECG, CXR and echocardiographic findings in congenital heart disease that presents with cyanosis after the newborn period	CbD, DOPS, mini-CEX, *	1
The indications, limitations and risks of invasive and non-invasive investigation of congenital heart disease presenting with cyanosis after the newborn period	CbD, DOPS, mini-CEX, *	1,2
The angiographic and haemodynamic findings at cardiac catheterisation in congenital heart disease that presents with cyanosis after the newborn period	CbD, DOPS, mini-CEX, *	1
Know the indications and risks of catheter intervention and surgery in congenital heart disease that presents with cyanosis after the newborn period	CbD, DOPS, mini-CEX, *	1,2
Skills		
Be able to:		
Take a relevant history and perform an appropriate examination	mini-CEX	1
Interpret ECG, CXR and blood results and appreciate their importance and limitations in reaching a diagnosis	DOPS, mini-CEX	1
Use echocardiography to accurately diagnose abnormalities in cardiac structure or function	CbD, DOPS, mini-CEX	1
Identify where information is incomplete and plan further investigation either by non-invasive imaging or cardiac catheterisation	CbD, DOPS, mini-CEX	1
Make an accurate anatomical and physiological diagnosis on the basis of the clinical information and investigations	CbD, mini-CEX	1
Identify when there is cyanosis coupled with cardiac failure and initiate medical treatment when necessary	mini-CEX	1
Plan and coordinate surgery or catheter intervention where necessary	CbD, mini-CEX	1,3
Counsel parents and give a realistic prognosis	CbD, DOPS, mini-CEX	1,3,4
Outline a treatment plan in terms understood by the parents	DOPS, mini-CEX, PS	1,3,4
Provide advice to referring paediatricians in respect of management of children with cyanosis	CbD, DOPS, mini-CEX	1,3
Offer advice and support in respect of schooling and sporting activity	CbD, mini-CEX	1,3
Plan and participate in outpatient follow-up	mini-CEX	1,3
Behaviours		

Appreciate the concerns and anxiety of parents and other family members	CbD, DOPS, mini-CEX, PS	1,3,4

5. Evaluation of a Child with a Cardiac Murmur

To be able to carry out specialist assessment and treatment of children with cardiac murmurs

Knowledge	Assessment Methods	GMP
Know:		
The physical signs that may be found on examination of the cardiovascular system and how to interpret those findings	CbD, mini-CEX, *	1
The characteristic clinical features of all congenital cardiac defects	CbD, mini-CEX, *	1
The characteristic features of innocent murmurs	CbD, mini-CEX, *	1
Skills		
Be able to:		
Obtain a relevant history and perform cardiac examination	mini-CEX	1
Discriminate innocent from pathological murmurs on examination	mini-CEX	1
Make a logical provisional diagnosis on the basis of physical examination	CbD, mini-CEX	1
Refine the diagnosis using ECG and CXR where appropriate	CbD, DOPS, mini-CEX	1
Use echocardiography to accurately define cardiac structure and function	CbD, DOPS	1
Complete the assessment quickly in an outpatient setting	mini-CEX	1
Be able to confidently diagnose normality and explain the meaning of an innocent murmur	DOPS, mini-CEX, PS	1,3
Explain any abnormality, its prognosis, its relevance to lifestyle and the need for antibiotic prophylaxis	CbD, mini-CEX, PS	1,3
Behaviours		
Appreciate the concerns of parents of children who have been referred for evaluation of a heart murmur	CbD, mini-CEX, PS	1,3,4
Appreciate the need for accuracy and confidence in diagnosis	CbD, mini-CEX	1,2,3,4
Be able to deal with uncooperative young children and privacy issues in adolescence	DOPS, mini-CEX	1,3,4

6. Evaluation of Children and Adolescents with Chest Pain, Palpitations or Syncope

To be able to carry out specialist assessment and treatment of children and adolescents with chest pain, palpitations, presyncope or syncope

Knowledge	Assessment Methods	GMP
Know:		
The cardiac and non-cardiac causes of loss of consciousness	CbD, mini-CEX, *	1
The clinical features that discriminate between arrhythmias, vasovagal syncope and seizures in patients with loss of	CbD, mini-CEX, *	1

consciousness		
The clinical features that suggest an arrhythmia in patients with palpitations	CbD, mini-CEX, *	1
The causes of chest pain in childhood	CbD, mini-CEX, *	1
The clinical features that characterise the various causes of chest pain	CbD, mini-CEX, *	1
The types of structural heart disease that present with chest pain, palpitations or syncope	CbD, mini-CEX, *	1
The indications for an exercise test, ambulatory ECG, cardiac event recorder and tilt-table test in the investigation of these conditions	CbD, mini-CEX, *	1
Skills		
Be able to:		
Take an appropriate detailed history, eliciting all information that may help discriminate between cardiac and non-cardiac causes of chest pain, palpitations and syncope	mini-CEX	1
Make a logical provisional diagnosis on the basis of history and physical examination	mini-CEX	1
Identify features on the 12-lead ECG that suggest the substrate for an arrhythmia	CbD, mini-CEX	1
Identify ECG evidence of ischaemic heart disease and ventricular hypertrophy	CbD, DOPS, mini-CEX	1
Use echocardiography to accurately define cardiac structure and function	DOPS	1
Make an appropriate plan for further investigation and follow-up	CbD, mini-CEX	1
Complete the assessment quickly in an outpatient setting	mini-CEX	1
Interpret exercise test, ambulatory ECG, cardiac event recorder and tilt-table test results in the context of the history	CbD, DOPS, mini-CEX	1
Diagnose normality	CbD, DOPS, mini-CEX	1
Institute and monitor appropriate treatment for arrhythmias and vasovagal syncope	CbD, mini-CEX	1
Explain the plan for further investigation and the reasons for this line of investigation in terms understandable to the patient and parents	mini-CEX, PS	1,3
Explain the likely diagnosis and its impact on lifestyle	CbD, mini-CEX	1,3
Provide reassurance where there is no organic cause for symptoms	CbD, mini-CEX, PS	1,3
Refer appropriately to other specialties when a non-cardiac cause is likely	CbD, mini-CEX	1,3
Behaviours		
Appreciate the concerns of children, adolescents and their parents	CbD, mini-CEX, MSF, PS	1,3,4
Appreciate the need for accuracy and confidence in diagnosis	CbD, mini-CEX	1,3,4
Facilitate the involvement of adolescents in decision making	CbD, mini-CEX, PS	1,3,4

7. Acyanotic Congenital Heart Disease

To be able to carry out specialist assessment and treatment of children, adolescents and adults

with acyanotic congenital heart disease and plan surgical intervention where necessary		
Knowledge	**Assessment Methods**	**GMP**
Know the embryology, detailed anatomy, physiology, epidemiology, natural history and genetic implications of all acyanotic congenital heart defects including: • Atrial septal defect • Ventricular septal defect • Atrioventricular septal defect • Patent arterial duct • Aortopulmonary septal defect • Coronary artery fistula • Pulmonary stenosis • Aortic stenosis • Coarctation of the aorta • Interrupted aortic arch • Hypoplastic left heart syndrome	CbD, DOPS, mini-CEX, *	1
Understand the impact of left to right shunts on pulmonary vascular resistance	CbD, DOPS, mini-CEX, *	1
Know:		
The clinical presentation and ongoing pathophysiological changes of all acyanotic congenital heart defects	CbD, DOPS, mini-CEX, *	1
The surgical and catheter intervention treatment options for each lesion and the relative advantages and disadvantages of each approach	CbD, DOPS, mini-CEX, *	1
The success rates and complications of surgery and catheter intervention	CbD, DOPS, mini-CEX, *	1,2
The normal course of postoperative recovery after surgery for each type of acyanotic cardiac defect	CbD, mini-CEX, *	1
Skills		
Be able to:		
Make a provisional diagnosis and discriminate between the various acyanotic defects on the basis of presentation, clinical findings, ECG and CXR	CbD, DOPS, mini-CEX	1
Accurately diagnose all acyanotic defects using echocardiography and use echocardiography to define the detailed anatomy and physiological characteristics of the defect	CbD, DOPS	1,2
Perform TOE to define the anatomical and physiological details of acyanotic defects	DOPS	1
Identify where information is incomplete and plan further investigation either by non-invasive imaging or cardiac catheterisation	CbD, DOPS, mini-CEX	1,2
Perform diagnostic cardiac catheterisation, obtaining all necessary anatomical and physiological information	DOPS	1
Make an accurate anatomical and physiological diagnosis on the basis of the clinical information and investigations	CbD, DOPS, mini-CEX	1,2
Stabilise infants with prostaglandin E2 in duct dependent lesions	mini-CEX	1

Plan and coordinate appropriate medical management, catheter intervention and surgery when necessary	CbD, DOPS, mini-CEX	1,3
Counsel parents when acyanotic congenital heart disease has been diagnosed, explaining the anatomy, giving a realistic prognosis, explaining likely symptoms and outlining a management plan	CbD, DOPS, mini-CEX, PS	1,3
Communicate effectively with paediatric cardiology nursing staff, physiotherapists, dieticians, intensivists, surgeons and anaesthetists in coordinating management	DOPS, mini-CEX, MSF	1,3
Offer advice and support in respect of schooling and sporting activity	CbD, mini-CEX	1,3
Plan and participate in outpatient follow-up	CbD, mini-CEX	1,3
Behaviours		
Appreciate the concerns and anxiety of parents and other family members	CbD, DOPS, mini-CEX, MSF, PS	1,3,4
Appreciate the importance of close communication with referring paediatricians in managing children jointly with peripheral hospitals	CbD, mini-CEX, MSF	1,3,4

8. Cyanotic Congenital Heart Disease

To be able to carry out specialist assessment and treatment of children, adolescents and adults with cyanotic congenital heart disease and plan surgical intervention where necessary

Knowledge	Assessment Methods	GMP
Know the embryology, detailed anatomy, physiology, epidemiology, natural history and genetic implications of all cyanotic congenital heart defects including: • Pulmonary atresia with intact ventricular septum • Pulmonary atresia with ventricular septal defect • Critical pulmonary stenosis • Tetralogy of Fallot • Absent pulmonary valve syndrome • Transposition of the great arteries with intact ventricular septum • Transposition of the great arteries with ventricular septal defect • Double outlet right ventricle • Common arterial trunk • Total anomalous pulmonary venous connection • Univentricular atrioventricular connection • Complex congenital heart disease associated with abnormalities of cardiac position and situs	CbD, DOPS, mini-CEX, *	1
Know the clinical presentation all cyanotic congenital heart defects and the long term complications of cyanosis	CbD, mini-CEX, *	1
Understand the surgical and catheter intervention treatment options for each lesion and the relative advantages and disadvantages of each approach	CbD, DOPS, mini-CEX, *	1,2
Know the success rates and complications of surgery and catheter intervention	CbD, DOPS, mini-CEX, *	1,2
Know the normal course of postoperative recovery after surgery for	CbD, mini-CEX, *	1

each type of cyanotic cardiac defect		
Skills		
Be able to:		
Make a provisional diagnosis and discriminate between the various cyanotic defects on the basis of presentation, clinical findings, ECG and CXR	CbD, DOPS, mini-CEX	1
Use echocardiography to accurately diagnose cyanotic defects and to define the detailed anatomy and physiological characteristics of the defect	CbD, DOPS	1
Perform TOE to define the anatomical and physiological details of cyanotic defects	DOPS	1
Identify where information is incomplete and plan further investigation either by non-invasive imaging or cardiac catheterisation	CbD, DOPS, mini-CEX	1
Perform diagnostic cardiac catheterisation, obtaining all necessary anatomical and physiological information	DOPS	1
Provide emergency treatment for cyanotic spells	mini-CEX	1
Stabilise infants with prostaglandin E in duct dependent lesions	mini-CEX	1
Make an accurate anatomical and physiological diagnosis on the basis of the clinical information and investigations	CbD, DOPS, mini-CEX	1
Plan and coordinate appropriate medical management, catheter intervention and surgery when necessary	CbD, DOPS, mini-CEX	1,3
Counsel parents when cyanotic congenital heart disease has been diagnosed, explaining the anatomy, giving a realistic prognosis, explaining likely symptoms and outlining a management plan	CbD, DOPS, mini-CEX, PS	1,3
Offer advice and support in respect of schooling and sporting activity	CbD, mini-CEX	1,3
Communicate effectively with paediatric cardiology nursing staff, physiotherapists, dieticians, intensivists, surgeons and anaesthetists in coordinating management	DOPS, mini-CEX, MSF	1,3
Plan and participate in outpatient follow-up	CbD, mini-CEX	1,3
Behaviours		
Appreciate the concerns and anxiety of parents and other family members	CbD, mini-CEX, MSF, PS	1,3,4
Appreciate the importance of close communication with referring paediatricians in managing children jointly with peripheral hospitals	CbD, mini-CEX, MS	1,3,4
Recognise the wider management issues in children with complex cyanotic defects or syndromes and cooperate with other specialties	CbD, mini-CEX	1,3,4

9. Pulmonary Hypertension

To diagnose pulmonary hypertension(PH)

To understand management of PH

Knowledge	Assessment Methods	GMP
Know:		
Physical signs	CbD, mini-CEX, *	1
Understand basic electrocardiography	CbD, DOPS, mini-CEX, *	1

Understand basic echocardiography and how to do an echocardiogram	CbD, DOPS, mini-CEX, *	1
Understand principles of cardiovascular physiology	CbD, DOPS, mini-CEX, *	1
Understand the significance of PH in context of CHD, and in its absence	CbD, DOPS, mini-CEX, *	1
To be informed about current therapies including lung transplantation	CbD, mini-CEX, *	1
To understand how to inform parents/patients about severe incurable disease	CbD, mini-CEX, *	1
Skills		
Be able to:		
Make a competent physical examination	CbD, mini-CEX	1
Interpret ECG to diagnose PH	CbD, DOPS, mini-CEX	1
Interpret echocardiogram to diagnose PH	CbD, DOPS, mini-CEX	1
Interpret cardiac catheterisation data to diagnose PH	CbD, DOPS, mini-CEX	1
Be capable of integrating information from various investigations	CbD, mini-CEX	1
Learning by observation	CbD, mini-CEX	1
Behaviours		
Be aware of the limitations of the patient	CbD, mini-CEX	1
Have an appropriate threshold for seeking advice	CbD, mini-CEX	1,3
Be able to relate findings to physical and ECG findings and be aware of inconsistencies	CbD, DOPS, mini-CEX	1
Appreciate necessity of team work in assessing need for surgical /medical intervention and social implications	CbD, mini-CEX	1,3,4
Be aware of therapeutic limitations	CbD, mini-CEX	1
Appreciate sensitivity of issues and need for support in the community	CbD, mini-CEX	1,3,4

10. Fontan Circulation

To be able to carry out specialist assessment, treatment and surgical referral of children, adolescents and adults who require or have a cavopulmonary circulation

Knowledge	Assessment Methods	GMP
Understand the physiology of the Fontan circulation	CbD, DOPS, mini-CEX, *	1
Know:		
The anatomical and physiological requirements necessary for a child to tolerate a cavopulmonary circulation	CbD, DOPS, mini-CEX, *	1
The various surgical procedures used to create a Fontan circulation	CbD, DOPS, mini-CEX, *	1
The complications of a Fontan circulation	CbD, DOPS, mini-	1

	CEX, *	
How to manage a Fontan circulation in the postoperative period	CbD, mini-CEX, *	1
Skills		
Be able to:		
Recognise when a biventricular repair cannot be achieved and palliation with a cavopulmonary circulation is appropriate	CbD, DOPS, mini-CEX	1
Carry out echocardiography and cardiac catheterisation to determine whether a cavopulmonary circulation is possible	DOPS	1
Interpret clinical information and the results of non-invasive and invasive investigations to determine whether a cavopulmonary circulation is possible and the appropriate timing of surgery	CbD, DOPS, mini-CEX	1
Recognise a failing Fontan circulation	CbD, DOPS, mini-CEX	1
Evaluate the cause of inappropriately low oxygen saturation after a cavopulmonary circulation	CbD, mini-CEX	1
Behaviours		
Recognise the additional stress on parents where their child cannot undergo corrective surgery	CbD, mini-CEX, PS	1,3
Recognise the need for close support of the family where the child has to undergo multiple procedures	mini-CEX, MSF, PS	1,3
Appreciate the role of the cardiac liaison nurse and the ward nursing staff in the care of children who need repeated investigation and surgery	CbD, mini-CEX, MSF	1,3
Appreciate the need for continuity of care	CbD, mini-CEX	1,4

11. Inflammatory Cardiovascular Disease

To be able to carry out specialist assessment and treatment of children with rheumatic fever, rheumatic heart disease, Kawasaki disease and other inflammatory diseases affecting the cardiovascular system

Knowledge	Assessment Methods	GMP
Know:		
The pathology and natural history of rheumatic fever, Kawasaki disease and collagen vascular disease affecting the cardiovascular system	CbD, mini-CEX, *	1
The cardiac and non-cardiac manifestations of these disorders	CbD, mini-CEX, *	1
The echocardiographic features of these disorders	CbD, DOPS, mini-CEX, *	1
The current recommendations for investigation and treatment of acute and chronic Kawasaki disease	CbD, DOPS, mini-CEX, *	1
The current recommended drug therapy for acute rheumatic fever and the long term sequelae of acute rheumatic fever	CbD, mini-CEX, *	1
Skills		
Be able to:		
Recognise the clinical features of Kawasaki disease and carry out echocardiographic examination of the coronary arteries	CbD, DOPS, mini-CEX	1

Advise on acute and long-term treatment for Kawasaki disease and arrange an appropriate programme of follow up	CbD, mini-CEX	1
Understand the indications to perform coronary angiography in children	CbD, mini-CEX	1
Advise on acute treatment for rheumatic fever and recognise the indications for surgery or intervention in rheumatic heart disease	CbD, mini-CEX	1
Be able to identify the presence and severity of rheumatic heart disease on echocardiography	CbD, DOPS	1
Behaviours		
Understand the importance of primary and secondary prevention in rheumatic fever	CbD, mini-CEX	1
Recognise the anxiety of parents whose child is affected by Kawasaki disease and offer appropriate explanations and reassurance	CbD, mini-CEX, PS	1,3,4
Cooperate with other specialties in investigating collagen vascular diseases with cardiovascular involvement	CbD, mini-CEX	1,3
Appreciate the need to coordinate joint care with the general paediatric team	CbD, mini-CEX, MSF	1,3,4

12. Cardiomyopathy and Myocarditis

To be able to carry out specialist assessment and treatment of children with cardiomyopathy and myocarditis

Knowledge	Assessment Methods	GMP
Know:		
The causes, physiology, pathology, natural history, prognosis and clinical features of dilated, hypertrophic and restrictive cardiomyopathy	CbD, DOPS, mini-CEX, *	1
The causes, physiology, pathology, natural history, prognosis and clinical features of myocarditis	CbD, DOPS, mini-CEX, *	1
The genetics of hypertrophic cardiomyopathy	CbD, mini-CEX, *	1
The indications for medical and surgical treatment in cardiomyopathy	CbD, mini-CEX, *	1
The available forms of circulatory support (LVAD, ECMO)	CbD, mini-CEX, *	1
The role of cardiac transplantation in end-stage cardiomyopathy	CbD, mini-CEX, *	1
Skills		
Be able to:		
Take a relevant history and perform an appropriate examination	mini-CEX	1
Recognise features in the history that suggest myocarditis	CbD, mini-CEX	1
Carry out a full echocardiographic evaluation of a child with myocarditis or cardiomyopathy, including an assessment of the coronary arteries	DOPS	1
Manage cardiac failure and low cardiac output caused by myocarditis or cardiomyopathy	CbD, mini-CEX	1
Involve the genetics team where appropriate	CbD, mini-CEX	1,3
Behaviours		
Show sensitivity in counselling parents with a child severely affected	CbD, mini-CEX, PS	1,3,4

by cardiomyopathy		
Involve parents in decision making in planning management for end-stage cardiomyopathy	mini-CEX, PS	1,3,4
Provide the family with a realistic prognosis	CbD, mini-CEX	1,3,4
Consider other aspects of disorders underlying the cardiomyopathy or other organs affected in planning for treatment in end-stage cardiomyopathy	CbD, mini-CEX	1

13. Prevention and Management of Infective Endocarditis

To be able to carry out specialist assessment and treatment of children with infective endocarditis and to be able to provide advice in respect of prevention of endocarditis

Knowledge	Assessment Methods	GMP
Know:		
The epidemiology, pathophysiology, clinical manifestations, anatomical features, course and prognosis of various types of infective endocarditis	CbD, mini-CEX, *	1
Which cardiac lesions have the highest risk of endocarditis	CbD, mini-CEX, *	1
The role of blood cultures, inflammatory markers, transthoracic and transoesophageal echocardiography in diagnosing infective endocarditis	CbD, DOPS, mini-CEX, *	1
The current recommended antibiotic regimes for endocarditis treatment in children	CbD, mini-CEX, *	1
The recent alterations in the advice on endocarditis prophylaxis and the evidence behind this change in practice	CbD, *	1
Skills		
Be able to:		
Take a relevant history and perform an appropriate examination	mini-CEX	1
Identify the extracardiac manifestations of endocarditis	CbD, mini-CEX	1
Interpret blood results and recognise echocardiographic manifestations of endocarditis and appreciate their importance and limitations in reaching a diagnosis	CbD, DOPS, mini-CEX	1
Integrate clinical and laboratory findings to plan appropriate management	CbD, mini-CEX	1
Plan surgical management in patients with acute valvar insufficiency secondary to endocarditis	CbD, mini-CEX	1
Provide patient education in respect of antibiotic prophylaxis	CbD, mini-CEX	1,3
Provide support to paediatricians investigating pyrexia of unknown origin	mini-CEX, MSF	1,3
Behaviours		
Understand the importance of close cooperation with microbiologists in diagnosing and treating endocarditis	CbD, mini-CEX	1,3

14. Cardiovascular Abnormalities in Neonatal Intensive Care

To be able to carry out specialist assessment and advise on the treatment of cardiovascular problems commonly arising in the context of neonatal intensive care

Knowledge	Assessment Methods	GMP
Understand the physiology of transitional circulation	CbD, DOPS, mini-CEX, *	1
Know:		
The pathophysiology, clinical manifestations, echocardiographic features and treatment of persistent pulmonary hypertension of the newborn	CbD, DOPS, mini-CEX, *	1
The pathophysiology, clinical manifestations and echocardiographic features of patent arterial duct in the preterm child	CbD, DOPS, mini-CEX, *	1
The indications and contraindications for medical and surgical treatment of patent arterial duct in the preterm child	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to:		
Differentiate PPHN from congenital heart disease using echocardiography	CbD, DOPS, mini-CEX	1
Use echocardiography to exclude duct dependent systemic and pulmonary circulation when assessing an infant with a patent arterial duct	CbD, DOPS	1
Identify congenital heart disease in premature and low birth weight infants and make a management plan, including appropriate timing of surgery	DOPS, mini-CEX	1
Behaviours		
Understand basic neonatal care and how sepsis, lung disease, neurological problems and genetic issues influence cardiac management	CbD, DOPS, mini-CEX	1

15. Cardiovascular Evaluation of Children with Genetic Disorders and Syndromes

To be able to carry out specialist cardiac assessment and treatment of children with genetic disorders and syndromes

Knowledge	Assessment Methods	GMP
Know the cardiac abnormalities found in common genetic disorders and syndromes including: • Down's syndrome • Trisomy 18 • Trisomy 13 • 22q11 deletion (DiGeorge) • Turner's syndrome • Noonan's syndrome • William's syndrome • Alagille's syndrome • Marfan's syndrome • CHARGE association • VACTERL association	CbD, DOPS, mini-CEX, *	1

• Storage diseases • Neuromuscular diseases • Mitochondrial cytopathies Hyperlipidaemias Long QT syndrome		
Know the prognosis of genetic syndromes and their associated cardiac disorders	CbD, mini-CEX, *	1
Skills		
Be able to:		
Take a relevant history and perform an appropriate cardiac examination	mini-CEX	1
Use echocardiography to accurately diagnose abnormalities in cardiac structure or function	DOPS	1
Behaviours		
Recognise the importance of the genetics and paediatric team in coordinating overall management	CbD, mini-CEX	1,3
Recognise the impact of other features of the genetic disorder or syndrome on cardiac management	CbD, mini-CEX	1
Be willing to discuss the possibility of recurrence of the cardiac disorder in subsequent children but recognise the boundaries of expertise in paediatric cardiology	CbD, mini-CEX	1,3
Be aware of the need to offer fetal cardiology review for future pregnancies	CbD, mini-CEX	1
Discuss wider issues involving genetics with sensitivity when planning intervention or surgery for congenital heart disease with parents	CbD, mini-CEX	1,3,4

16. Cardiac Evaluation of a Child with Stridor

To be able to carry out specialist cardiac assessment of children with stridor and referral for cardiac surgery where necessary

Knowledge	Assessment Methods	GMP
Know:		
The embryology, anatomy and natural history of vascular rings and slings and their association with lung pathology	CbD, mini-CEX, *	1
How to perform an echocardiographic examination specifically for vascular rings and slings	CbD, DOPS, *	1
The limitations of echocardiography in identifying vascular rings	CbD, DOPS, mini-CEX, *	1
The signs of vascular rings and slings on CXR and barium swallow	CbD, DOPS, mini-CEX, *	1
The angiographic and MRI features of vascular rings and slings	CbD, DOPS, mini-CEX, *	1
The surgical options for release of rings and slings	CbD, mini-CEX, *	1
Skills		
Be able to:		

Perform echocardiography to identify the presence of vascular rings and slings	DOPS	1
Select patients who merit further investigation by bronchoscopy or MRI and interpret the results of these investigations	CbD, DOPS, mini-CEX	1
Be able to perform angiography to define aortic and pulmonary artery anatomy where MRI is not available	DOPS	1
Plan appropriate surgery for release of vascular rings or slings	CbD, DOPS, mini-CEX	1
Discuss the causes of stridor with parents, offering reassurance where appropriate	CbD, mini-CEX	1,3
Behaviours		
Cooperate with paediatricians in planning management of children with stridor	CbD, mini-CEX, MS	1,3,4
Be aware of the need to cooperate with thoracic surgeons in children with associated lung abnormalities	CbD, mini-CEX	1,3,4

17. Detection and Management of Fetal Cardiac Abnormalities

To be able to advise on appropriate referral for fetal cardiac evaluation and to be able to advise parents on the timing and the limitations of antenatal diagnosis

Knowledge	Assessment Methods	GMP
Know:		
The indications for a fetal cardiac assessment	CbD, mini-CEX, *	1
The limitations of fetal echocardiography	CbD, mini-CEX, *	1
The associations between fetal cardiac abnormality and genetic abnormalities	CbD, *	1
Skills		
Be able to:		
Recognise when the heart is abnormal and identify common congenital heart defects and abnormal cardiac function in the fetus	CbD	1
Recognise foetal tachyarrhythmias and fetal heart block using M mode or Doppler echocardiography	CbD	1
Behaviours		
Appreciate the importance of providing a realistic view of outcome when helping parents to make decisions in respect of the pregnancy	CbD	1,3,4
Understand the importance of non-directive counselling regarding continuation or termination of pregnancy	MS, PS	1,3,4
Understand the anxiety and distress of parents presented with a foetal diagnosis of cardiac abnormality	CbD	1,3,4
Appreciate the need for close communication with the obstetric team	CbD, MSF	1,3

18. Adolescent and Adult Congenital Heart Disease

To be able to carry out basic assessment and treatment of adolescents and adults with congenital heart disease

Knowledge	Assessment Methods	GMP
Know:		
The natural history of congenital heart disease into adolescence and adult life	CbD, mini-CEX, *	1
The problems associated with unoperated congenital heart disease in adolescents and adults	CbD, mini-CEX, *	1
The long-term sequelae of surgery for congenital heart disease	CbD, mini-CEX, *	1
The implications of operated and unoperated congenital heart disease for contraception and pregnancy	CbD, mini-CEX, *	1
The cardiovascular contraindications to pregnancy	CbD, mini-CEX, *	1
The common rhythm disturbances in adult congenital heart disease and the treatment options	CbD, mini-CEX, *	1
The indications for non-invasive and invasive investigation in the adolescent and adult age group	CbD, mini-CEX, *	1
Skills		
Be able to:		
Carry out transthoracic and transoesophageal echocardiography in adolescent and adult patients	DOPS	1
Coordinate and interpret investigations	CbD, DOPS, mini-CEX	1
Arrange for a smooth transition from the paediatric to the adult congenital service	mini-CEX	1,3
Behaviours		
Appreciate the worries and concerns of adolescent and adult patients with congenital heart disease	CbD, mini-CEX	1,3
Appreciate the need to shift responsibility for the decision making from the parents to the patient	CbD, mini-CEX	1,3
Appreciate the need for patient privacy	CbD, mini-CEX, PS	1,4
Understand the need for genetic counselling	CbD, mini-CEX	1
Understand the need for assessment during pregnancy by the fetal cardiology service	CbD, mini-CEX	1,3

19. Arrhythmias

To be able to carry out assessment and treatment of children and adult congenital heart disease patients with arrhythmias

Knowledge	Assessment Methods	GMP
Know:		
The various types of arrhythmia found in fetal life, infancy, childhood, adolescence and in adults with congenital heart disease	CbD, *	1
The mechanisms involved in the genesis of cardiac arrhythmias	CbD, mini-CEX, *	1
The natural history, presentation and clinical features of arrhythmias from fetal to adult life	CbD, mini-CEX, *	1
The types of structural heart disease and types of cardiac surgery associated with abnormalities in cardiac rhythm	CbD, mini-CEX, *	1
The genetic disorders associated with cardiac rhythm disturbance	CbD, mini-CEX, *	1
The causes, natural history and management of atrioventricular block	CbD, mini-CEX, *	1
The characteristic ECG findings in all forms of tachyarrhythmia and bradyarrhythmia	CbD, mini-CEX, *	1
The indications for exercise testing, ambulatory monitoring, cardiac event recorders, implantable loop recorders, invasive electrophysiology study, radiofrequency ablation and implantable cardiac defibrillators	CbD, DOPS, mini-CEX, *	1
The classification, mechanism of action, interactions, side effects, contraindications and clinical use of antiarrhythmic drugs in paediatric patients	CbD, mini-CEX, *	1
The indications for permanent pacing, the types of cardiac pacing and the indications for each type of pacing in paediatric patients	CbD, mini-CEX, *	1
Know the indications for DC cardioversion		
The indications, limitations and risks of an invasive electrophysiology study and radiofrequency ablation	CbD, DOPS, mini-CEX, *	1,2
Skills		
Be able to:		
Take a history in a patient with palpitations and decide whether an arrhythmia is likely	mini-CEX	1
Form an appropriate plan of further investigation in a patient with suspected arrhythmias	CbD, mini-CEX	1
Recognise and manage SVT from fetal to adult life	CbD, mini-CEX	1
Identify the type of arrhythmia present from an event captured on ECG	CbD, mini-CEX	1
Process 24 hour tapes, including review and interpretation of the full record	DOPS	1
Carry out exercise tests and interpret the results	DOPS	1
Perform and interpret an ECG taken during an adenosine challenge	DOPS	1
Perform and interpret an ECG from atrial epicardial wires in the postoperative patient	DOPS, mini-CEX	1
Interpret the results from cardiac event recorders, implantable loop	DOPS	1

recorders and pacemaker telemetry		
Manage temporary pacing, including the use of epicardial wires in the postoperative cardiac patient	DOPS, mini-CEX	1
Select appropriate drug treatment for tachyarrhythmias	CbD, mini-CEX	1
Perform vagal manoeuvres, overdrive pacing and DC cardioversion in the treatment of tachyarrhythmias	DOPS, mini-CEX	1
Explain arrhythmias and their associated risks to patients and their parents	mini-CEX	1,3
Offer appropriate management options to the patient and family	CbD, mini-CEX	1,3,4
Provide advice in respect of sports and exercise	CbD, mini-CEX	1,3
Behaviours		
Appreciate the anxiety arrhythmias cause to patients and their parents	CbD, mini-CEX	1,3,4
Understand the importance of patient education in managing ongoing symptoms and determining the most appropriate treatment for each individual	CbD, mini-CEX	1
Involve the genetics team where there is a genetic component to the disorder	CbD, mini-CEX	1,3

20. Paediatric Cardiac and Cardiopulmonary Transplantation

To recognise when heart or heart-lung transplantation is indicated, to refer appropriately to a transplant centre and to provide local follow-up after transplantation

Knowledge	Assessment Methods	GMP
Know:		
The indications and contraindications for cardiac transplantation	CbD, mini-CEX, *	1
The principles of recipient evaluation	CbD, mini-CEX, *	1
The principles of immunology and immunosuppression involved in cardiac transplantation	CbD, mini-CEX, *	1
The effects and side effects of immunosuppressive drugs used following cardiac transplantation	CbD, mini-CEX, *	1
The problems of infection, immunoproliferative disease, coronary arteriopathy and rejection following cardiac transplantation	CbD, mini-CEX, *	1
Skills		
Be able to:		
Realistically counsel the parents of children with terminal cardiac disorders about the possibility of cardiac transplantation, the prospects of success and the long-term outlook following transplantation	CbD, mini-CEX	1,3,4
Recognise potential clinical signs of cardiac graft rejection	CbD, mini-CEX	1
Communicate effectively with the transplant centre to plan further investigation	mini-CEX, PS	1,3
Behaviours		
Be aware of the ethical and legal issues in respect of donor selection and management and organ procurement	CbD, mini-CEX	1,4

Refer appropriately to the transplant centre	CbD, mini-CEX	1,3
Appropriately refer in cases of possible graft rejection	CbD, mini-CEX	1,3

21. Nutrition and Growth in Congenital Heart Disease

To be able to recognise nutrition and growth problems related to congenital heart disease and direct appropriate strategies to optimise nutritional intake and maximise growth

Knowledge	Assessment Methods	GMP
Know:		
The causes of growth failure in congenital heart disease	CbD, mini-CEX, *	1
How to manage fluid and caloric intake in children with cardiovascular disease	CbD, mini-CEX, *	1
How to manage fluid balance after cardiac surgery	CbD, mini-CEX, *	1
The indications for parenteral nutrition	CbD, mini-CEX, *	1
How to reintroduce feeds after necrotising enterocolitis or other bowel damage	CbD, mini-CEX, *	1
The causes of chylothorax and when to introduce a medium chain triglyceride diet	CbD, mini-CEX, *	1
Skills		
Be able to:		
Recognise failure to thrive and be able to identify cardiac and non-cardiac causes	CbD, mini-CEX	1
Institute and monitor feeding regimes in children with cardiac failure	CbD, mini-CEX	1
Manage fluid intake and fluid balance after cardiac surgery	CbD, mini-CEX	1
Identify iron deficiency in patients with cyanotic congenital heart disease	CbD, mini-CEX	1
Identify when failure to thrive has not responded to optimising nutrition and decide on appropriate timing for surgical intervention in congenital heart disease patients	CbD, mini-CEX	1
Behaviours		
Recognise the importance of nursing staff and dieticians in supervising and advising on nutrition	CbD, mini-CEX, MSF	1,3
Be aware of the complications of parenteral nutrition	CbD, mini-CEX	1
Provide information to parents about feeding regimes	CbD, mini-CEX, PS	1,3

22. Assessment of Children Prior to Cardiac Surgery

To be able to carry out specialist assessment of children requiring cardiac surgery and to plan the nature and timing of cardiac surgery in conjunction with the paediatric cardiac surgery team

Knowledge	Assessment Methods	GMP
Know:		
The principles of cardiopulmonary bypass and the risks involved	CbD, mini-CEX, *	1
The risks and benefits of various types of pump and non-pump surgery	CbD, mini-CEX, *	1,2
Factors that place a child at increased risk from cardiac surgery	CbD, mini-CEX, *	1,2
The role of play specialists and psychologists in preparing children for cardiac surgery	CbD, mini-CEX, *	1,2
Skills		
Be able to:		
Take account of the cardiac status and non-cardiac pathology in selecting the most appropriate timing for surgery	CbD, mini-CEX	1,2
Present relevant details of the cardiac condition and the results of investigations to the cardiac surgeons to reach a joint plan on surgery	CbD, mini-CEX	1,3
Behaviours		
Have a multi-disciplinary approach to preoperative assessment	CbD, mini-CEX, MSF	1,3
Appreciate the technical limitations of surgery	CbD	1,2

23. Care of Children Following Cardiac Surgery

To be able to carry out and direct intensive care, ward-based care and outpatient care following paediatric cardiac surgery

Knowledge	Assessment Methods	GMP
Know:		
The postoperative problems caused by cardiopulmonary bypass	CbD, mini-CEX, *	1
The particular problems associated with cardiac surgery for the various types of congenital heart defect	CbD, mini-CEX, *	1
The problems in managing a cavopulmonary circulation	CbD, *	1
How to manipulate pulmonary vascular resistance and how to prevent and treat pulmonary hypertensive crises	CbD, *	1
How to assess cardiac output and tissue oxygen delivery	CbD, mini-CEX, *	1
Skills		
Be able to:		
Secure arterial access and peripheral and central venous access	DOPS	1
Interpret readings from intracardiac and intravascular pressure lines	CbD	1
Manage fluid balance, electrolyte balance, coagulation abnormalities and inotropic support	CbD, mini-CEX	1
Manage rhythm abnormalities	CbD, DOPS, mini-	1

	CEX	
Recognise signs of cerebral damage and seizures and arrange for appropriate investigation and treatment	mini-CEX	1
Detect when there are markers of sepsis, take appropriate measures to identify the source and select effective antibiotic treatment	mini-CEX	1
Use echocardiography to evaluate the results of surgery, assess cardiac function and identify pericardial effusions, pleural effusions, and intracardiac and great vessel thrombus	DOPS	1
Identify when further evaluation is required by cardiac catheterisation	CbD	1
Identify when there are undiagnosed lesions or residual lesions that need further surgical intervention	CbD, mini-CEX	1
Outline an intensive care treatment plan in terms understood by the parents	mini-CEX	1,3
Counsel parents about the results of surgery and the child's current status	mini-CEX	1,3
Give a realistic prognosis when there have been postoperative cardiac problems or problems with other organ systems	CbD, mini-CEX	1,3,4
Respond quickly and efficiently to sudden haemodynamic instability	mini-CEX	1,2
Behaviours		
Understand the concerns and anxiety of parents and other family members	CbD, MSF, PS	1,3,4
Appreciate the importance of good communication and collaboration between different disciplines	CbD, MSF	1,3
Understand the importance and role of paediatric cardiac intensive care nursing staff	MSF	1,3
Deal sympathetically with bereavement	MSF	1,3,4

24. Assessment of Children with Cardiac Disease Prior to Non-Cardiac Surgery

To be able to carry out specialist assessment of children with cardiac disease prior to non-cardiac surgery

Advise on fitness for such surgery and any precautions or cardiac treatment required

Knowledge	Assessment Methods	GMP
Know the cardiac disorders associated with a higher risk for general anaesthesia	CbD, *	1
The role of play specialists and psychologists in preparing children for surgery	CbD	1,2
Skills		
Be able to:		
Take a relevant history and perform an appropriate examination, noting in particular any change in cardiac status	mini-CEX	1
Select patients who require further investigation by ECG, CXR or echocardiography	CbD, mini-CEX	1
Determine the physiology of the cardiac abnormality and the cardiac reserve using ECG, CXR and echocardiography	DOPS, mini-CEX	1

Identify patients who are at increased risk from anaesthesia and recommend appropriate precautions	CbD, mini-CEX	1,2
Recommend an appropriate fluid regime and how cardiac drugs are to be administered in the perioperative period	CbD, mini-CEX	1
Answer questions from patients and their parents about the impact of their cardiac condition on the safety of anaesthesia and surgery	mini-CEX, PS	1,3
Behaviours		
Be aware of the need to inform the anaesthetist and surgeon of the cardiac status and any particular precautions required	CbD, mini-CEX	1,3
Appreciate the importance of chronic antibiotic therapy in selecting appropriate antibiotic prophylaxis	mini-CEX	1

25. Management of Critically Ill Children with Cardiovascular Compromise

To be able to carry out assessment and treatment of children who are critically ill with severe haemodynamic disturbance

Knowledge	Assessment Methods	GMP
Understand the principles of oxygen supply and demand	CbD, mini-CEX, *	1
Understand the factors controlling cardiac output	CbD, mini-CEX, *	1
Understand compensatory mechanisms maintaining cardiovascular homeostasis	CbD, mini-CEX, *	1
Know the common causes of haemodynamic instability during childhood and know how to differentiate sepsis, hypovolaemia, cardiac failure, cardiac tamponade and hypotension secondary to cardiac rhythm disturbances	CbD, mini-CEX, *	1
Skills		
Be able to:		
Recognise the clinical signs of low cardiac output and the clinical signs of progression to shock	CbD, mini-CEX	1
Recognise the biochemical markers of low cardiac output	CbD, mini-CEX	1
Use echocardiography to assist in determining the cause of haemodynamic instability	DOPS, mini-CEX	1
Appropriately use fluid administration and inotropic support to optimise cardiac output and tissue oxygen delivery	mini-CEX	1
Initiate intensive care support for children with haemodynamic instability	mini-CEX	1
Behaviours		
Recognise the importance of cooperation with intensivists and other paediatric specialties	mini-CEX, MSF	1,2,3
Have sufficient communication skills to sensitively discuss problems of critically ill children with parents and relatives	mini-CEX, MSF, PS	1,3,4
Be able to break bad news	mini-CEX, MSF, PS	1,3,4

Part 3 – Investigations and Procedures

1. 12 Lead ECG

To be able to carry out and interpret a 12 lead ECG in all age groups

Knowledge	Assessment Methods	GMP
Know:		
The standard lead placement for paediatric ECG recording and lead placement for dextrocardia	CbD, *	1
Age related changes in ECG wave forms	CbD, DOPS, mini-CEX, *	1
How to evaluate rhythm, hypertrophy, ischaemia, injury and infarction on ECG	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to:		
Perform a 12 lead ECG with accurate lead placement appropriate to the age of the child	DOPS, mini-CEX-CEX	1,4
Interpret ECG in relation to age related changes	CbD, DOPS, mini-CEX	1
Recognise and interpret abnormal QRS axis, atrial enlargement, normal and abnormal patterns of atrial depolarisation, ventricular hypertrophy, normal and abnormal patterns of ventricular depolarisation, normal and abnormal ventricular repolarisation, , bundle branch block, heart block, preexcitation and tachyarrhythmias on the ECG	CbD, DOPS, mini-CEX	1
Perform an atrial wire ECG using epicardial pacing wires	CbD, DOPS	1
Behaviours		
Appreciate the limitations of an ECG	CbD, DOPS, mini-CEX	1

2. Ambulatory ECG, Exercise Testing and Cardiac Event Recording

To be able to carry out and interpret the following investigations for diagnosis and assessment of children with cardiac disease and adult congenital heart disease patients:

ambulatory ECG

exercise test

cardiac event recorder

Knowledge	Assessment Methods	GMP
Know:		
The indications for an ambulatory ECG, exercise test and cardiac event recorder	CbD, mini-CEX, *	1
The normal range of findings on a paediatric 24 hour ECG	CbD, DOPS, mini-CEX, *	1
The physiology of cardiovascular response to exercise	CbD, mini-CEX, *	1
The contraindications and age limitations to exercise testing in children	CbD, mini-CEX, *	1

The methodology of a treadmill test	CbD, DOPS, *	1
The normal heart rate and blood pressure response to exercise	CbD, DOPS, *	1
Skills		
Be able to:		
Scan a complete 24 hour tape, select appropriate highlights and produce an accurate report	DOPS, mini-CEX	1
Interpret the results of a 24 hour tape	CbD, DOPS, mini-CEX	1
Perform an exercise test and obtain exercise data free of artefact	DOPS, mini-CEX	1
Interpret changes in heart rate, blood pressure and oxygen saturation during an exercise test	CbD, DOPS, mini-CEX	1
Interpret changes in the ECG during the exercise test	CbD, DOPS, mini-CEX	1
Interpret the results of a cardiac event recorder	CbD, DOPS, mini-CEX	1
Behaviours		
Appreciate the limitations of these non-invasive investigations	CbD, mini-CEX	1,2
Appreciate the sensitivity, specificity and predictive accuracy of exercise ECG	CbD, mini-CEX	1,2

3. ECG with Adenosine Challenge

To be able to carry out and interpret an ECG taken during an adenosine challenge		
Knowledge	**Assessment Methods**	**GMP**
Know the indications for adenosine challenge and how to acquire an ECG of optimum quality	CbD, mini-CEX, *	1
Skills		
Be able to:		
Acquire an ECG during an adenosine challenge with appropriate monitoring and resuscitation equipment available	CbD, DOPS, mini-CEX	1
Diagnose the mechanism of an arrhythmia based on the result of the adenosine challenge	CbD, DOPS, mini-CEX	1
Behaviours		
Help teach paediatric staff the correct method of ECG acquisition during adenosine cardioversion	DOPS, mini-CEX	1,3
Provide explanation to patients and parents about the effect of adenosine administration	mini-CEX, PS	1,3

4. Chest X-Ray

To be able to interpret a CXR to assist diagnosis and assessment of cardiac disease at all ages		
Knowledge	**Assessment Methods**	**GMP**
Know:		
The principles of radiation protection	CbD, DOPS, *	1
The classical abnormalities in cardiac silhouette produced by congenital heart defects	mini-CEX, *	1
The characteristic CXR appearances of high and low pulmonary blood flow, pulmonary oedema and pulmonary vascular disease with pulmonary hypertension	CbD, mini-CEX, *	1
Skills		
Be able to:		
Diagnose abnormalities in cardiac position and identify when great artery arrangement is abnormal on CXR	CbD, mini-CEX	1
Interpret patterns of pulmonary vasculature on CXR	CbD, mini-CEX	1
Recognise lung pathology on CXR	CbD, mini-CEX	1
Use information on the CXR to assist in making an anatomical and physiological diagnosis in congenital heart disease	CbD, mini-CEX	1
Behaviours		
Appreciate the limitations of the CXR in diagnosing and assessing congenital heart disease	CbD, mini-CEX	1

5. Tilt Testing

To be able to interpret tilt table tests in evaluating patients with syncope		
Knowledge	**Assessment Methods**	**GMP**
Know:		
The physiological principles of tilt table testing	CbD, mini-CEX, *	1
The indications for tilt table testing	CbD, mini-CEX, *	1
The methodology of tilt table testing	CbD, mini-CEX, *	1
Skills		
Be able to:		
Supervise a tilt table test	mini-CEX	1
Resuscitate a child during a tilt table test	CbD	1,2
Interpret the results of a tilt table test	CbD	1
Behaviours		
Appreciate the sensitivity and specificity of a tilt table test	CbD, mini-CEX	1
Understand the limitations of tilt-table testing	CbD, mini-CEX	1

6. DC Cardioversion

To be able to perform elective and emergency DC cardioversion		
Knowledge	**Assessment Methods**	**GMP**
Know:		
The indications for synchronised and unsynchronised DC cardioversion	CbD, DOPS, mini-CEX, *	1
The safety precautions necessary for protection of patients and staff during DC cardioversion	CbD, DOPS, *	1,2
Skills		
Be able to:		
Operate various types of equipment for DC cardioversion	DOPS	1
Select an appropriate energy for DC cardioversion for different arrhythmias at different ages	CbD, DOPS	1
Carry out DC cardioversion as part of emergency resuscitation	DOPS	1
Behaviours		
Appreciate the possibility of underlying abnormalities in cardiac rhythm, structure or function causing abrupt haemodynamic deterioration after cardioversion and make appropriate preparations for resuscitation	CbD, DOPS, min-CEX	1,2

7. Basic Cardiac Pacing

To be able to perform temporary pacing and acquire basic skills in pacemaker monitoring		
Knowledge	**Assessment Methods**	**GMP**
Know:		
Electrophysiology and cardiac anatomy relevant to pacing	CbD, DOPS, *	1
The indications for temporary and permanent pacing	CbD, mini-CEX, *	1
How to carry out temporary pacing using epicardial or oesophageal wires following cardiac surgery	mini-CEX, *	1
The principles of monitoring, interrogating and programming pacemakers	CbD, *	1
Skills		
Be able to:		
Insert a temporary pacing wire in a child or adult	DOPS	1
Carry out single and dual chamber pacing using epicardial wires in postoperative patients	mini-CEX	1
Carry out overdrive pacing to treat tachyarrhythmias	mini-CEX	1
Behaviours		
Appreciate the anxiety often suffered by children with pacemakers and their parents	CbD, mini-CEX, MSF, PS	1,3
Understand the importance of growth in pacemaker implantation	CbD, mini-CEX	1
Have appropriate self-confidence and recognise personal limitations when monitoring of permanent pacemaker function	CbD, mini-CEX	1,4

8. Pericardiocentesis

To be able to perform pericardiocentesis safely and effectively		
Knowledge	**Assessment Methods**	**GMP**
Know the indications for pericardiocentesis	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to:		
Identify when pericardiocentesis can be performed safely and the most effective approach	CbD, DOPS, mini-CEX	1,2
Carry out pericardiocentesis on children of all ages	DOPS, mini-CEX	1,2
Behaviours		
Appreciate the risks of pericardiocentesis	CbD, DOPS, mini-CEX	1

9. Balloon Atrial Septostomy

To be able to assist in balloon atrial septostomy safely and effectively		
Knowledge	**Assessment Methods**	**GMP**
Know:		
The indications for balloon atrial septostomy	CbD, mini-CEX, *	1
The risks of balloon atrial septostomy	CbD, mini-CEX, *	1
Skills		
Be able to:		
Perform transthoracic echocardiography to guide balloon atrial septostomy	DOPS	1
Supervise the care of an infant after balloon atrial septostomy	mini-CEX	1
Counsel the parents in respect of the risks and benefits of the procedure	mini-CEX, MSF, PS	1,3
Behaviours		
To appreciate the importance of teamworking during balloon septostomy and to recognise one's own limitations	CbD	1,3,4

10. Transthoracic Echocardiography

To be able to perform echocardiography in all ages from newborn to adult to diagnose and assess all forms of congenital and acquired heart disease

To be able to perform and evaluate the results of echo-contrast studies

Knowledge	Assessment Methods	GMP
Know and understand:		
The physics of echocardiography, colour Doppler and spectral Doppler	CbD, DOPS, *	1
The factors determining image quality and resolution	CbD, DOPS, mini-CEX, *	1
The function of the controls on machines used for echocardiography and Doppler	CbD, DOPS, *	1
The echocardiographic characteristics of all congenital heart defects and how to assess the physiology of shunting defects	CbD, DOPS, mini-CEX, *	1
How to assess valve stenosis and regurgitation	CbD, DOPS, mini-CEX, *	1
How to assess ventricular function	CbD, DOPS, mini-CEX, *	1
The indications for echo-contrast studies	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to:		
Manipulate the image to obtain optimal image quality	DOPS	1
Obtain all appropriate views during an echocardiographic examination and produce a structured record of the examination	DOPS	1
Obtain all possible information in the examination of a child with congenital or acquired heart disease	DOPS, mini-CEX	1
Interpret the significance and reliability of the information obtained by echocardiography	CbD, DOPS, mini-CEX	1
Perform and interpret echo-contrast studies to identify abnormal venous connections and to assess right to left shunts	CbD, DOPS	1
Behaviours		
Demonstrate ability to work with and where appropriate educate echocardiography technicians	DOPS, MSF	1,3
Be aware of the limitations of echocardiography and Doppler	CbD, DOPS, mini-CEX	1,2
Have appropriate self-confidence and recognise personal limitations in echocardiography skills	CbD, DOPS, mini-CEX, MSF	1,4

11. Transoesophageal Echocardiography

To be able to perform transoesophageal echocardiography in all ages to diagnose and assess congenital and acquired heart defects

Knowledge	Assessment Methods	GMP
Know:		
The indications for and risks of transoesophageal echocardiography	CbD, DOPS, mini-CEX, *	1
The echocardiographic planes required to display various cardiac structures	CbD, DOPS, *	1
The transoesophageal echocardiography appearance of congenital cardiac defects	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to perform transoesophageal echocardiography:	DOPS	1
In the diagnosis of complex congenital cardiac defects	DOPS	1
To evaluate adolescent and adult congenital heart disease	DOPS, mini-CEX	1
To guide catheter interventions	DOPS	1
Intraoperatively to guide surgical repair	DOPS	1
Behaviours		
Have appropriate self-confidence and recognise personal limitations	CbD, DOPS, MSF	1,4

12. Cardiac Catheterisation

To be able to interpret the results of diagnostic cardiac catheterisation in children and adults with cardiac disease

Knowledge	Assessment Methods	GMP
Know:		
The indications for diagnostic cardiac catheterisation	CbD, mini-CEX, *	1
How to interpret haemodynamic data	CbD, *	1
The principles of protection from ionising radiation, attend the mandatory course on protection from ionising radiation and acquire certification	CbD, *	1,2
The indications for considering the following common interventions: • Occlusion of patent arterial duct • Balloon pulmonary valvoplasty • Balloon aortic valvoplasty • Pulmonary artery angioplasty • Recoarctation angioplasty	CbD, mini-CEX, *	1
The basic principles of less common interventions	CbD, mini-CEX, *	1
Skills		
Be able to:		
Plan and supervise pre and post catheter management	mini-CEX	1

Interpret clinical information and the results of non-invasive investigations to decide what information must be acquired by cardiac catheterisation	CbD, mini-CEX	1
Behaviours		
Appreciate the importance of providing detailed information about the procedure and its potential complications to patients or their parents	CbD, mini-CEX	1,3
Appreciate the importance of team work with radiologists, catheter lab staff, anaesthetists and technical staff	CbD, mini-CEX, MSF	1,3

13. Cardiac MRI and Thoracic CT

To be able, with appropriate consultation, to interpret the results of the following investigations for the diagnosis and assessment of children with cardiac disease and adult congenital heart disease patients:

- **Cardiac MRI**
- **Thoracic CT**

Knowledge	Assessment Methods	GMP
Know:		
Indications and contraindications for cardiac MRI and CT of the thorax	CbD, mini-CEX, *	1
The basics of MR safety	CbD, mini-CEX, *	1,2
The fundamentals and limitations of MR image acquisition	CbD, mini-CEX, *	1
The information that can be obtained by MRI including: (i) Static and dynamic imaging of the heart and great vessels (ii) Functional information such as flow, velocity, perfusion and ventricular function	CbD, mini-CEX, *	1
Skills		
Be able to:		
Interpret basic MR and CT images of the heart and great vessels, recognising when expert help is required	CbD, mini-CEX	1,2,3,4
Plan and supervise the pre and post investigation management of cardiac MR patients, particularly GA	CbD, mini-CEX	1,2
Interpret clinical information and the results of other investigations to decide what information must be acquired by cardiac MRI	CbD, mini-CEX	1
Interpret images from basic MR sequences	CbD, mini-CEX	1
Interpret cardiac MR reports and their application to clinical management	CbD, mini-CEX	1
Behaviours		
Be aware of the limitations of non-invasive imaging	CbD, mini-CEX	1,2
Appreciate the importance of understanding cardiac anatomy in 3-dimensions	CbD, mini-CEX	1
Have an appropriate threshold for seeking expert advice	CbD, mini-CEX, MSF	1,3
Appreciate the importance of providing detailed information about the procedure and its' potential complications to patients or their parents	CbD, mini-CEX	1,3
Understand the importance of an accurate record of the procedure	CbD, mini-CEX	1,3

and findings		
Appreciate the importance of team work with radiologists, radiographers, anaesthetists and technical staff	CbD, mini-CEX, MSF	1,3
Appreciate the importance of being involved in national audit in cardiac MR	CbD	1,2,3

14. Radiation Use and Safety

Be able to use radiation equipment appropriately and safely for the diagnosis, assessment and treatment of patients with cardiac disease according to the regulations IRR 99 and IRMER 2000 or their successors

Knowledge	Assessment Methods	GMP
Define the physics and hazards of ionising radiation to patients and staff	CbD, *	1,2
The current statutory requirements concerning the medical use of ionising radiation	CbD, *	1,2
Know how to operate the equipment involved in the use of ionising radiation	CbD, *	1
Define the factors that affect radiation exposure to both patients and staff	CbD, *	1,2
Know the important aspects of cardiac radiology	mini-CEX, *	1
Skills		
Be able to operate radiation equipment safely and effectively	DOPS	1,2
Has successfully completed a period of practical supervised training in the use of radiation equipment	CbD, mini-CEX	1,2
Behaviours		
Appreciate the risks and benefits to patients and staff of using ionising radiation	CbD	1,2

Part 4 – Medical Leadership

1. Personal qualities

Identify own strengths, limitations and the impact of their behaviour and is able to change their behaviour in light of feedback and reflection

Knowledge	Assessment Methods	GMP
Demonstrates different methods of obtaining feedback	CbD	1
Awareness of the trainee's own values and principles and how these may differ from those of other individuals and groups.	MSF, CbD	1,3,4
The importance of best practice transparency and consistency	CbD	1
Skills		
Maintain and routinely practice critical self awareness, including being able to discuss strengths and weaknesses with supervisor and recognising external influences and changing behaviour accordingly.	MSF	1
Use assessment, appraisal, complaints and other feedback to discuss and develop an understanding of own development needs	MSF	1.3
Identify own strengths and weaknesses.	MSF	1,3
Organise and manage workload effectively and flexibly.	MSF	1, 3
Behaviours		
Recognising and showing respect for diversity and differences in others	MSF	1
Shows commitment to continuing professional development which involves seeking training and self development opportunities, learning from colleagues and accepting criticism	MSF	1,3
Demonstrate self management: organising and managing themselves while taking account of the needs and priorities of others.	CbD, PS	3

2. Managing Services

Support team members to develop their roles and responsibilities and continue to review performance of the team members to ensure that planned service outcomes are met

Knowledge	Assessment Methods	GMP
Demonstrate knowledge of relevant legislation and HR policies	MSF	1
Show knowledge of the duties, rights and responsibilities of an employer and co-worker	MSF	1
Demonstrates knowledge of individual performance review	MSF	1
Understand the roles, competences and capabilities of other professionals and support workers.	MSF, CbD	1,3,4
Understand the role of audit (improving patient care and services, risk management etc).	MSF, CbD	1
Understand the steps involved in completing the audit cycle.	MSF, CbD	1
Skills		
Continue to contribute towards staff development and training, including mentoring, supervision and appraisal	.MSF	1,3

Able to write a job description, including person specification and short listing criteria.	CbD, MSF	1
Contribute to the development of an organisational response to emerging health policy.	CbD	1
Behaviours		
Commitment to good communication whilst also inspiring confidence and trust	MSF	1,3
Manage resources: know what resources are available and use influence to ensure that resources are used efficiently and safely.	MSF, CbD	1
Manage people: providing direction, reviewing performance and motivating others.	MSF, CbD	1, 3
Manage performance: hold oneself and others accountable for service outcomes.	MSF, CbD	1, 3

3. Improving Services

Ensure patient safety at all times, continue to encourage innovation and facilitate transformation		
Knowledge	**Assessment Methods**	**GMP**
Demonstrate knowledge of risk management issues and risk management tools	CbD	1,2
Demonstrates understanding of how healthcare governance influences patient care.	CbD	1
Demonstrates a knowledge of a variety of methodologies for developing creative solutions to improving services	CbD	1,2
Recall principles of risk assessment and management.	CbD	1, 2
Identify risk management guidance e.g. safe prescribing, sharps disposal, needlestick injury.	CbD	1, 2
Skills		
Reports clinical incidents	MSF	1,2
Be able to assess and manage risk to patients.	MSF	2
Monitors the quality of equipment and safety of the environment relevant to the specialty	MSF, CbD, mini-CEX	1,2
Ensure the correct and safe use of medical equipment, ensuring faulty equipment is reported appropriately.	mini-CEX-CEX	2
Questions existing practice in order to improve the services	MSF	1,2
Behaviours		
Seeks advice and or assistance whenever concerned about patient safety	MSF	1,2,3
Supports colleagues to voice new ideas and is open minded to new thoughts.	MSF	1,3

4. Setting Direction

Is able to identify the contexts for change and is able to make decisions		
Knowledge	**Assessment Methods**	**GMP**

Demonstrates knowledge of the functions and responsibilities of national bodies, College and faculties, representatives, regulatory bodies.	CbD	1
Demonstrates effective communication strategies within organisations	MSF	1
Skills		
The ability to discuss the local, national and UK health priorities and how they impact on the delivery of health care relevant to the specialty	CbD	1
Is able to run committee meetings and work collegiately and collaboratively with a wide range of people outside the immediate clinical setting	CbD	1,3
Behaviours		
Willingness to articulate strategic ideas and use effective influencing skills	MSF, CbD	1,3
Willingness to participate in decision making processes beyond the immediate clinical care setting	MSF, CbD	1,3
Apply knowledge and evidence: gathering information to produce an evidence-based challenge to systems and processes in order to identify opportunities for service improvements.	CbD	1
Make decisions: integrating values with evidence to inform decisions.	Min-CEX	1, 3

Part 5 – Specialist Area Training

1. Fetal Cardiology

Specialists who wish to sub-specialise in fetal cardiology need a detailed knowledge of the indications for fetal cardiac assessment. Communication and counselling skills are of utmost importance, as is an appreciation of the importance of multidisciplinary team discussion and decisions on management during pregnancy and in the neonatal period.
It is envisaged that a one year programme of sub-specialist training will be necessary in order to achieve the basic competencies set out in the curriculum, with a further year likely to be required for those planning a career as a sub-specialist in fetal cardiology. During this 2 year period the trainee should retain a close involvement with the clinical activities of the department, including a regular general paediatric cardiology on-call commitment.

To be able to carry out specialist assessment and counselling of women referred for fetal cardiac evaluation		
Knowledge	**Assessment Methods**	**GMP**
Know:		
The indications for a fetal cardiac assessment	CbD, mini-CEX, *	1
How the natural history of cardiac lesions may differ in the fetal compared to the postnatal population	CbD, DOPS, mini-CEX, *	1
How to perform a fetal echocardiographic examination, including knowledge of its limitations	CbD, DOPS, *	1
The risks and natural history of fetal arrhythmias	CbD, DOPS, mini-CEX, *	1
The associations between fetal cardiac abnormality and genetic abnormalities	CbD, DOPS, mini-CEX, *	1
The causes of fetal hydrops and its natural history when associated with cardiac abnormality	CbD, DOPS, *	1
Skills		
Be able to:		
Produce standard echocardiographic views of the fetal heart at various gestational ages	DOPS	1
Recognise when the heart is abnormal and identify common congenital heart defects and abnormal cardiac function in the fetus	CbD, DOPS	1
Detect fetal tachyarrhythmias and fetal heart block using M mode or Doppler echocardiography	DOPS	1
Interpret the significance of fetal karyotype results and genetic analysis	CbD, mini-CEX	1
Make an appropriate management plan when the fetus has congenital heart disease, including where the child should be delivered	CbD, DOPS, mini-CEX	1
Behaviours		

Appreciate the importance of providing a realistic view of outcome when helping parents to make decisions in respect of the pregnancy	CbD, DOPS, mini-CEX	1,3,4
Understand the anxiety and distress of parents presented with a fetal diagnosis of cardiac abnormality	CbD, DOPS, mini-CEX, MSF, PS	1,3,4
Understand the importance of ongoing support during the pregnancy and detailed discussions to explain the diagnosis and prognosis	CbD, DOPS, MSF, PS	1,3
Appreciate the need for close communication with the obstetric and neonatology teams	CbD, DOPS, MSF	1,3
Understand the importance of working closely with the fetal medicine service	MSF, PS	1,3

2. Specialist Imaging - Cardiac MRI and Thoracic CT

At present the mainstay of specialist imaging in congenital heart disease is MRI, but it will be essential for those specialising in MRI to have sound knowledge of the alternative and complementary roles of other imaging modalities such as CT scanning.

Specialists who wish to run a cardiac MR program need a detailed knowledge of the specialty. This extends to both the role of MR in the management of congenital heart disease, but also the technical aspects of how to obtain high quality information for all the different indications and how to process and report the scans.

Objectives
Specialist area training in magnetic resonance imaging aims at equipping the trainee to provide the lead in MR application in the centre in which he works. As a consultant the trainee may provide the sole expertise within his department or operate in collaboration with other imaging specialists. As a consultant the trainee will work with radiographers and radiologists within their Trust. It is probable that the trainee will retain links with his training centre as well as make further contacts leading to a specialist network.

Entry Requirements
Entry to cardiac MR specialist area training will be after completion of the three year core training in paediatric cardiology. The trainee will already have a detailed knowledge of the anatomy and physiology of native and operated congenital heart disease before embarking on training in cardiac MR.

Duration of Training
Cardiac MR reflects a significant departure from the techniques with which paediatric cardiology trainees will become familiar during their core training. It is a fast evolving specialty with rapid developments in hardware and particularly software (imaging sequences). In order to utilise cardiac MR the trainee must acquire a detailed understanding of the types of sequence available, the strengths and limitations of each sequence, and the complex web of parameters which must be optimised for each sequence, all allied with an understanding of the physics of MRI and how it impinges on the clinical process. This knowledge cannot be acquired during the core training. It is envisaged that a one year programme of clinical training will be necessary in order to allow the trainee to achieve the basic competencies for advanced imaging, with a further year for those who plan a career independently managing an advanced imaging service.

Research and Audit
It is envisaged that trainees would undertake research and audit within the cardiac MR department. The pursuit of a higher degree (MSc, MD or PhD) is desirable but not compulsory. A maximum of 3 months spent solely in research may count towards training in the specialist area as it can for the other specialist areas.

Clinical experience
It is envisaged that trainees will be predominantly involved in the clinical provision of the MR service. This will involve organising MR lists and liaising with other members of the congenital heart disease team. The trainee will oversee MR lists and report on scans with supervision. It is important that the trainee retains a close involvement with the clinical activities of the department, being closely involved with the combined cardiac-surgical meeting. During this 1 or 2 year period the trainee should retain a

close involvement with the clinical activities of the department, including a regular on call commitment.

Cardiac MRI

To equip the trainee to independently support all aspects of a clinical MR service within their unit		
Knowledge	**Assessment Methods**	**GMP**
Know:		
The imaging and functional characteristics of different congenital and acquired cardiac abnormalities	CbD, DOPS, mini-CEX, *	1
Indications for, and contra-indications to, the application of cardiac MR	CbD, DOPS, mini-CEX, *	1
Magnetic resonance physics and a basic understanding of the physics of the various MR sequences	CbD, DOPS, *	1
Comprehension of the various imaging sequences; their strengths, weaknesses and application and optimisation	CbD, DOPS, mini-CEX, *	1
Comprehension of various imaging protocols for different clinical application/disease entities	CbD, DOPS, mini-CEX, *	1
Understanding of MR artefacts; their influence on interpretation and minimisation	CbD, DOPS, *	1
Detailed knowledge of the different image processing tools both for analysis of functional data and for reformatting structural data	CbD, DOPS, *	1
Practical knowledge of image formats; their characteristics and limitations, and the ability to interchange data between them	CbD, DOPS, *	1
Risks and complications of MR scan particularly with respect to consent issues	CbD, DOPS, *	1,2,3
Safety in the MR scanner suite	CbD, DOPS, *	1,2
Relationship of MR with other imaging modalities for complex physiological measurements and interventions	CbD, DOPS, mini-CEX, *	1
The use of phantom models to assess imaging and measurement under controlled conditions	CbD, DOPS, *	1
Skills		
To be able to:		
Set up and organise a cardiac MR service including general anaesthetic list for infants and young children	CbD	1
Develop MR study protocols (a set of specific sequences) for particular conditions and adapt them to specific patients	CbD, DOPS	1
Optimise and acquire MR sequences which provide the best image/functional information	CbD, DOPS	1
Perform post-processing on MR data for image presentation and quantification of physiological data	DOPS	1
Interpret and report MR structural and functional data	CbD, DOPS	1
Provide training to radiographers and other clinical staff such as paediatric cardiology/radiology trainees in all of the above	DOPS, MSf	1,3
Behaviours		
Appreciate the importance of good communication skills with other	CbD, MSF	1,3

members of the clinical team as well as patients and parents of patients		
Appreciate the importance of good organisational skills in running a cardiac MR service to ensure effective service delivery and in particular in timely and accurate reporting/presentation of the scans	CbD	1,3
Appreciate the importance of understanding individual limitation and need for expert/outside advice	CbD	1,4
Appreciate the rapidly changing nature of cardiovascular MR and by keeping abreast of these changes optimising the service provided	CbD	1

Thoracic CT

To be able to interpret the results of the following investigations for the diagnosis and assessment of children with cardiac disease and adult congenital heart disease patients.

Knowledge	Assessment Methods	GMP
Know:		
Indications for CT of the thorax	CbD, mini-CEX, *	1
The principles of protection from ionising radiation, attend the mandatory course on protection from ionising radiation and acquire certification	CbD, mini-CEX, *	1,2
Skills		
Be able to:		
Interpret CT images of the heart and great vessels in patients with congenital heart disease	CbD, mini-CEX	1
Behaviours		
Be aware of the limitations of non-invasive imaging	CbD, DOPS, mini-CEX	1
Appreciate the importance of understanding cardiac anatomy in 3-dimensions	CbD, DOPS, mini-CEX	1

3. Cardiac Catheterisation

Specialists who wish to sub-specialise in cardiac catheterisation need a detailed knowledge of the indications and contraindications for catheterisation as well as knowledge of and competence in dealing with complications. An appreciation of the importance of multi-disciplinary team discussion and decisions on the relative and complementary roles of therapeutic catheterisation and surgery is of prime importance. The concept of life-long learning is of particular importance in this field. Collaborative working with senior colleagues after appointment as a consultant is likely to be in the best interest of the patient, to ensure the individual's appropriate professional development and maintain clinical governance when dealing with infrequently performed or very complex interventions.

It is envisaged that a two year programme of sub-specialist training will be necessary in order to achieve the full competencies set out in the curriculum. Those wishing to offer support to a cardiac catheterisation service rather than leading a departmental interventional programme could undergo modular training for one nominal year. All those training in one of these posts will be expected to be proficient in both diagnostic and basic therapeutic interventional catheterisation, with experience of and exposure to more complex therapeutic procedures. During this nominal 2 year period the trainee should retain a close involvement with the clinical activities of the department, including a regular on call commitment.

To be able to perform and interpret the results of diagnostic cardiac catheterisation in children and adults with cardiac disease

To be able to perform the commoner therapeutic procedures independently, and to be able to carry out the rarer and more complex procedures in liaison with the lead clinician for therapeutic catheterisation

Knowledge	Assessment Methods	GMP
Know:		
The indications for diagnostic cardiac catheterisation	CbD, DOPS, mini-CEX, *	1
What equipment is necessary for each procedure	CbD, DOPS, mini-CEX, *	1
How to set up image intensifier angles, magnification and coning for angiogram acquisition	CbD, DOPS, *	1
The appropriate amount and rate of contrast delivery for angiography	CbD, DOPS, *	1
How to acquire and interpret haemodynamic data	CbD, DOPS, *	1
The principles of protection from ionising radiation, attend the mandatory course on protection from ionising radiation and acquire certification	CbD, DOPS, *	1,2
The indications, contraindications, technique and complications of the following common interventions: (i) Arterial duct occlusion (ii) Atrial septal defect closure (iii) Balloon pulmonary valvoplasty (iv) Balloon aortic valvoplasty (v) Pulmonary artery angioplasty and stenting	CbD, DOPS, mini-CEX, *	1,2

(vi) Native coarctation and recoarctation angioplasty and stenting		
The principles of less common interventions	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to:		
Plan and supervise pre and post catheter management	DOPS	1
Interpret clinical information and the results of non-invasive investigations to decide what information must be acquired by cardiac catheterisation	CbD, DOPS, mini-CEX	1
Form a detailed plan of how diagnostic catheterisation is to be performed and how important information is to be obtained	CbD, DOPS, mini-CEX	1
Acquire vascular access in all ages, manage anticoagulation, choose appropriate catheters and catheter routes, manipulate catheters successfully and safely, acquire appropriate haemodynamic data and perform angiography	DOPS	1,2
React quickly and appropriately to adverse changes in rhythm or haemodynamics	DOPS	1,2
Carry out haemodynamic calculations and interpret angiographic images correctly	CbD, DOPS	1
Carry out, as first operator, the more common interventions such as occlusion of the arterial duct, balloon pulmonary or aortic valvoplasty and angioplasty of pulmonary artery or recoarctation	DOPS	1
To carry out less common interventions with assistance	DOPS	1
Behaviours		
Appreciate the importance of providing detailed information about the procedure and its potential complications to patients or their parents	CbD, DOPS, mini-CEX, PS	1,3
Understand the importance of an accurate record of the procedure and findings	CbD, DOPS, mini-CEX	1,3
Have appropriate self-confidence and recognise personal limitations	CbD, DOPS, mini-CEX, MSF	1,4
Appreciate the importance of team work with radiologists and radiographers, catheter lab nursing staff, anaesthetists and cardiac physiology staff	DOPS, MSF	1,3
Appreciate the importance of being involved in national audit in therapeutic catheterisation	CbD, DOPS	1,2,3

4. Cardiac Pacing and Electrophysiology

Specialists who wish to sub-specialise in pacing and electrophysiology need a detailed knowledge of the mechanisms and treatment of arrhythmias and of anti-arrhythmic drug therapy as well as the indications for and complications of invasive electrophysiology. They should have a knowledge of pacemaker and device implantation techniques and be able to choose the appropriate access technique for each individual patient. They should have knowledge and experience of post-implantation follow-up and optimisation of pacemaker function, including cardiac resynchronisation. It is envisaged that a two year programme of sub-specialist training will be necessary in order to achieve the full competencies set out in the curriculum. Those wishing to offer support to a cardiac pacing service rather than leading a departmental electrophysiology and pacing programme could undergo modular training for one nominal year. During this nominal 2 year period the trainee should retain a close involvement with the clinical activities of the department, including a regular on call commitment. Exposure to adult invasive electrophysiology and pacing in adults is recommended due to the relatively small number of paediatric electrophysiology procedures and pacemaker implants in most paediatric cardiac centres.

To be able to perform permanent single and dual chamber pacemaker implantation and monitoring

To be able to perform invasive electrophysiological investigation of tachy- and brady-arrhythmias

To be able to carry out radiofrequency ablation for tachyarrhythmias

To be able to provide specialist advice relating implantable defibrillators and to be able to implant such a device

Knowledge	Assessment Methods	GMP
Know:		
Electrophysiology and cardiac anatomy relevant to pacing	CbD, DOPS, mini-CEX, *	1
The indications for temporary pacing and different modes of permanent pacing	CbD, DOPS, mini-CEX, *	1
The principles and practice of monitoring, interrogating and programming pacemakers	CbD, DOPS, mini-CEX, *	1
The mechanisms of brady- and tachy-arrhythmias and their anatomical substrates	CbD, DOPS, mini-CEX, *	1
The indications for radiofrequency ablation and implantable defibrillators	CbD, DOPS, mini-CEX, *	1
The principles of protection from ionising radiation, attend the mandatory course on protection from ionising radiation and acquire certification	CbD, *	1,2
Skills		
Be able to:		
Insert a single or dual chamber permanent pacemaker	DOPS	1
Carry out single and dual chamber pacing using epicardial wires in postoperative patients	DOPS	1
Carry out overdrive pacing to treat tachyarrhythmias	DOPS	1

Carry out and interpret invasive electrophysiological testing using right and left heart electrode placement in children and adults with congenital heart disease, carry out radiofrequency ablation of accessory pathways, the atrioventricular node and ectopic foci	DOPS	1
Perform a trans-septal puncture as first operator	DOPS	1
Implant an implantable defibrillator as first operator	DOPS	1
Behaviours		
Appreciate the anxiety often suffered by children with pacemakers and their parents	CbD, DOPS, mini-CEX, PS	1,3
Appreciate the size limitations when choosing pacemaker systems	CbD, DOPS, mini-CEX	1
Understand the importance of growth in pacemaker implantation	CbD, DOPS, mini-CEX	1
Have appropriate self-confidence and recognise personal limitations in implantation of permanent pacemakers	CbD, DOPS	1,3,4
Appreciate the different approaches to invasive electrophysiology in the very young	CbD, DOPS, mini-CEX	1
Appreciate the psychological difficulties faced by patients with an implanted defibrillator	CbD, DOPS, mini-CEX, PS	1
Appreciate that innovations in this field are frequent and will require a commitment to ongoing change in practice in line with these innovations	MSF, PS	1

5. Adolescent and Adult Congenital Heart Disease

More patients, with more complex disease survive to adulthood because of advances in neonatal and paediatric cardiac surgery and intervention. Furthermore, they survive with surgically modified disease which may be associated with an entirely different pathophysiology to that with which they were born. The majority require lifelong specialist follow up. As a result there is a growing need for specialist cardiologists with appropriate training in ACHD, so that patients are able to continue to receive expert care as they move from paediatric to adult services.

There is a need for 2 types of ACHD cardiologist, an ACHD or GUCH (Grown-Up Congenital Heart disease) specialist and a Paediatric or Adult Cardiologist with a special interest in ACHD/GUCH. Definitions used as per the recent BCCA document: Definitions of GUCH (Grown Up Congenital Heart disease or Adult Congenital Heart Disease) Specialists and Cardiologists with a Special Interest in GUCH. Type 1 will practice ACHD in one of a small number of specialist ACHD ("hub") Units as part of a team which includes specialist ACHD cardiac surgeons. Type 2 will practice adult or paediatric cardiology with a special interest in ACHD in non-specialist ("spoke") units, or in a specialist centre in association with one or more type 1 specialists. The principle difference in the training of Type 1 and Type 2 ACHD cardiologists is in the depth of knowledge required. The curriculum below applies to both types of ACHD training; the 2 types have been differentiated by the competencies expected and assessed.

An ACHD training centre should have the following:
At least one full time specialist ACHD consultant cardiologist (see BCCA document for definitions)
At least one specialist ACHD cardiothoracic surgeon
Specialist ACHD interventional catheterisation
Pacing and electrophysiology services equipped for patients with complex ACHD
Access to cardiothoracic transplant services
A high risk obstetric service
Close links with a paediatric cardiac centre with which a collaborative transition service operates.

An ACHD trainer should practice in a training centre as described above, and if all practice is in congenital cardiology spend ≥50% of clinical time in GUCH, or if practising in adult cardiology, spend ≥ 75% of clinical time in GUCH.

Pregnancy & Sexual Health

It is appropriate for the specialist in adult congenital heart disease to be fully informed of the training requirements for care of pregnancy in patients with heart disease, although not all adult congenital cardiologists will necessarily be taking charge of this aspect of service. All trainees on a nominal 2 year training scheme should therefore be exposed to the management of patients with congenital heart disease in pregnancy, and their competency in managing these complex patients should be assessed.

Heart disease is the single commonest cause of maternal death in the UK. Care has been assessed as being substandard in 40% of maternal deaths. This, in combination with the trend towards older maternal age and the increasing population of adult women with congenital heart disease surviving to have pregnancies, has

lead to a recognition of the need to improve and formalise training in cardiac disease in pregnancy.

Women with both acquired and congenital heart disease are at risk from pregnancy. However, the growing population of women with congenital heart disease means that any cardiologist with a special interest in cardiovascular disorders of pregnancy needs a sound training in adult congenital heart disease (see separate curriculum). The aim of this syllabus is to describe the main areas of learning that will equip the trainee to manage independently the cardiological aspects of pregnancy and contraception in heart disease.

During the nominal 2 year period of training in adult congenital heart disease the trainee should retain a close involvement with the clinical activities of the department, including a regular on call commitment. For trainees joining from adult cardiology, it is envisaged that at least 6 months of this time should undertaking paediatric cardiology. For trainees entering from paediatric cardiology, it is envisaged that at least 6 months should be spent in adult cardiology (congenital and acquired).

Management of ACHD

To be able to apply appropriately to the management of ACHD:
a knowledge of the substrate of congenital heart disease (CHD)
the knowledge that CHD is a lifelong condition
a knowledge of the natural and unnatural (operated) history of simple and complex CHD

Knowledge	Assessment Methods	GMP
Define the anatomy of the heart and great vessels	CbD, mini-CEX, *	1
Have a detailed understanding of cardiac embryology and development	CbD, mini-CEX, *	1
Define both common and rare congenital defects, their morphology and nomenclature	CbD, mini-CEX, *	1
Know that CHD is a continuum from fetal life through childhood and throughout adult life	CbD, mini-CEX, *	1
Define the natural history of simple and complex congenital cardiac conditions	CbD, mini-CEX, *	1
Define the unnatural (operated) history of simple and complex CHD	CbD, mini-CEX, *	1
Skills		
Be able to take a relevant history and perform an appropriate examination	CbD, mini-CEX	1
Be able to interpret paediatric, and to perform and interpret adult congenital echocardiograms. To be able to use echo to analyse the morphology and physiology of simple and complex CHD	CbD, DOPS	1
Demonstrate the ability to educate adolescents and young adults about their condition and its impact on their life	CbD, mini-CEX, PS	1,3
Be able to communicate with the parents and carers of adolescents and young adults, whilst respecting patient confidentiality	CbD, mini-CEX, PS	1,3,4
Behaviours		
Appreciate the importance of the management of patients during the transition from paediatric to adult clinics	CbD, mini-CEX	1

Recognise the importance of a multidisciplinary team in the managements of adolescents and young adults	CbD, mini-CEX, MSF	1,3
Through attendance at paediatric and adult CHD clinics, recognise how CHD develops and may become modified throughout life	CbD, mini-CEX	1
Recognise which patients with CHD need lifelong specialist follow up	CbD, mini-CEX	1

Multidisciplinary Approach to ACHD

To be able to apply appropriately the knowledge that the management of ACHD requires a multidisciplinary approach

Knowledge	Assessment Methods	GMP
Know that CHD has a psychosocial as well as physical impact on the patient and their family	CbD, mini-CEX	1
Be able to identify the ways in which CHD may impact on patients' lifestyle	CbD, mini-CEX	1
Be able to explain how patient education can empower young adults to take responsibility for their health	CbD, mini-CEX, PS	1,3
Skills		
Be able to communicate effectively within a multidiscplinary team	CbD, mini-CEX	1,3
Be able to communicate sensitively with adolescents and young adults	CbD, mini-CEX, PS	1,3
Be able to explain the impact of CHD on adolescent and young adults' leisure and work activities	CbD, mini-CEX	1,3
Behaviours		
Appreciate the social and emotional difficulties encountered by patients with CHD	CbD, mini-CEX, PS	1,3
Appreciate the psychological impact of ACHD on patients and their families	CbD, mini-CEX, PS	1,3
Appreciate the complex relationships that sometimes exist between patients with ACHD and their parents	CbD, mini-CEX, PS	1,3

Apply understanding of CHD to the investigation of ACHD

To apply a thorough understanding of CHD to the investigation of ACHD

Knowledge	Assessment Methods	GMP
Know how to investigate patients with CHD including the use and interpretation of non-invasive investigations such as echo and MRI, and invasive investigations such as cardiac catheterisation and TOE. Know the extended role of MRI in the management of patients with ACHD.	CbD, DOPS, mini-CEX, *	1
Skills		
Be able to perform and interpret echocardiograms, including TOE, of patients with ACHD. Be able to interpret cardiac MRI images	CbD, DOPS, mini-CEX	1
Be able to undertake diagnostic cardiac catheterisations in patients with CHD	DOPS	1
Behaviours		

Recognise the different and complementary contributions of different imaging modalities in the assessment of individual congenital cardiac lesions	CbD, DOPS, mini-CEX	1

Apply knowledge of CHD to its medical and surgical treatment

To apply appropriately a knowledge of CHD to its medical and surgical treatment

Knowledge	Assessment Methods	GMP
Know that congenital cardiac lesions and previous surgery may be associated with specific arrhythmias	CbD, mini-CEX, *	1
Know the indications for first time and repeated cardiac surgery for ACHD	CbD, mini-CEX, *	1
Identify potential complications faced by patients with CHD undergoing non-cardiac surgery	CbD, mini-CEX, *	1
Skills		
Be able to manage patients with arrhythmias and CHD. Be able to recognise the arrhythmias that are peculiar to some forms of CHD. Be able to evaluate patients at particular risk from arrhythmia	CbD, mini-CEX	1
Be able to oversee the peri-operative care of patients having surgical correction of congenital heart defects and recognise the post operative and iatrogenic complications faced by patients with complex disease	CbD, mini-CEX	1,2
Be able to assess the risk of non-cardiac surgery and provide appropriate advice on peri-operative management to avoid iatrogenic complications; especially the special risks faced by patients with complex disease	CbD, mini-CEX	1,2
Behaviours		
Recognise the urgency of treatment of arrhythmia in some patients with ACHD	CbD, mini-CEX	1
Recognise the need for first time and repeat operations in ACHD	CbD, mini-CEX	1
Appreciate the need for effective communication with healthcare professionals involved in the care of ACHD patients undergoing non-cardiac surgery	CbD, mini-CEX, MSF	1,3

Apply knowledge of CHD to catheter based treatment of ACHD

5. To be able to apply appropriately a knowledge of CHD to catheter based treatment of ACHD

(Specific example: performing and assessing suitability for device closure of atrial septal defect (ASD) or patent foramen ovale: Type 1 trainees)

Knowledge	Assessment Methods	GMP
Know that patent foramen ovale and secundum ASD defect may not exist in isolation	CbD, mini-CEX, *	1
Know that both are associated with other lesions that may need simultaneous device closure or may make the index defect unsuitable for device closure	CbD, mini-CEX, *	1
Know that the severity of coexistent acquired lesions such as mitral valve disease may be underestimated in the presence of ASD	CbD, mini-CEX, *	1

Be able to define and identify the different types of interatrial communication	CbD, DOPS, mini-CEX, *	1
Skills		
To be assessed as competent in diagnostic ACHD cardiac catheterisation before performing interventions	DOPS	1
Be able to undertake catheter based interventions, including joint procedures with paediatric interventional cardiologists for complex interventions	DOPS	1,3
Be able to perform and analyse TOE to identify different types of ASD and assess suitability for closure	DOPS	1
Be able to identify contraindications to device closure. Be able to evaluate MV disease in the presence of ASD	CbD, DOPS, mini-CEX	1
Be able to assess pulmonary vascular resistance in the presence of a shunt	CbD, DOPS	1
Be able to interpret pulmonary haemodynamic data in evaluating the suitability of an intracardiac defect for device closure	CbD, DOPS	1
Behaviours		
Recognise the need to audit all CHD activity	CbD, mini-CEX	1,2
Recognise the need to contribute data on all CHD interventions to the national CHD database	CbD, DOPS	1,2
Recognise the desirability of a team approach to complex CHD interventions	CbD, mini-CEX, MSF	1,3
Recognise the need for continuous TOE or intracardiac echo monitoring during device closure of cardiac defects	CbD, DOPS, mini-CEX	1

Definitions used above are taken from the March 2009 BCCA document at http://www.bcs.com/documents/09_March_FINAL_guch_definitions.doc

Assessment and treatment of pregnant women with chronic cardiac disease

To be able to carry out appropriate assessment and treatment of women with chronic cardiac disease who are or who are planning to become pregnant:

- **Corrected and uncorrected congenital heart disease**
- **Ventricular dysfunction**
- **Pulmonary hypertension**
- **Rheumatic heart disease**
- **Ischaemic heart disease**
- **Marfan's syndrome**
- **Artificial heart valves**
- **Arrhythmias**

Knowledge	**Assessment Methods**	**GMP**
To describe how pregnancy, delivery and the post partum period may affect cardiac function in normal women and in those with pre-existing cardiac disease	CbD, mini-CEX, *	1
Define the risks of pregnancy for the mother and fetus for different	CbD, mini-CEX, *	1,2

cardiac disorders		
Define the risks of recurrence of congenital heart disease in the fetus of mothers with congenital heart disease	CbD, mini-CEX, *	1,2
To list the possible adverse effects of drug treatment on both the woman and her fetus	CbD, mini-CEX, *	1
Define the implications of anticoagulation during pregnancy	CbD, mini-CEX, *	1
Skills		
Be able to take a relevant history and perform an appropriate examination	CbD, mini-CEX	1
Be able to assess cardiac patients' risk of becoming pregnant	CbD, mini-CEX	1
To be able to explain the increased risks of pregnancy in women with heart disease	CbD, mini-CEX, PS	1,3
To explain the increased risk of congenital heart disease in the foetuses of women with congenital heart disease	CbD, mini-CEX	1,3
Be able to offer ante-natal care, often in the setting of a joint obstetric clinic	mini-CEX	1,3
As part of a multispecialty team, be able to manage women with heart disease throughout pregnancy, delivery and the post-natal period	CbD, mini-CEX	1,3
Be able to counsel and manage women who require anticoagulation throughout pregnancy and the perperium	CbD, mini-CEX, PS	1,3
Behaviours		
Appreciate the increased anxiety experienced by pregnant women with cardiac disease	CbD, mini-CEX, PS	1,4
To recognise the role of cardiologists in the management of women preconception, during pregnancy and post partum	CbD, mini-CEX	1
To recognise the role of multidisciplinary care of women with heart disease and in particular liaison with obstetricians, midwives, haematologists, obstetric anaesthetists and intensivists	CbD, mini-CEX, MSF	1,3
To understand the importance of formulating an agreed flexible management plan for delivery	CbD, mini-CEX	1,2,3

Assessment and Contraceptive Advice for Women with Cardiac Disease

To be able to carry out appropriate assessment of, and provide contraceptive advice to, women with cardiac disease		
Knowledge	**Assessment Methods**	**GMP**
Know which contraceptive methods are safe and effective in women with different cardiac disorders	CbD, mini-CEX, *	1
Skills		
To be able to provide appropriate contraceptive advice to women with cardiac disease	CbD, mini-CEX	1
Behaviours		
Recognise the need to address and offer contraceptive advice to women with heart disease	CbD, mini-CEX	1

Pregnancy-Induced Cardiac Disease

To be able to carry out appropriate assessment and treatment of women with pregnancy-induced cardiac disease		
Knowledge	**Assessment Methods**	**GMP**
Know the risk factors for and presenting features of peripartum cardiomyopathy	CbD, mini-CEX, *	1
Know the risk of recurrence of peripartum cardiomyopathy in subsequent pregnancies	CbD, mini-CEX, *	1
Know the presenting features, appropriate investigation and management of cardiovascular emergencies during pregnancy including pulmonary embolism, aortic dissection and myocardial infarction	CbD, mini-CEX, *	1
Skills		
Initiate investigations to explore the differential diagnosis of peripartum cardiomyopathy	CbD, mini-CEX	1
To be able to explain the diagnosis and prognosis of peripartum cardiomyopathy to the patient and her relatives	CbD, mini-CEX, PS	1,3
To be able to investigate and treat appropriately cardiovascular emergencies in pregnancy	CbD, mini-CEX	1,2
Behaviours		
Recognise the need for urgent joint assessment between multispecialty teams	CbD, mini-CEX	1,3

6. Pulmonary Hypertension

Specialists who wish to play a major part in running the UK Service for the Care of Children and Young People with Pulmonary Hypertension will need a detailed knowledge of this branch of medicine in order to help their patients, take advantage of new therapies and treatment modalities and initiate advances in therapy. They will also have a considerable teaching commitment to inform paediatric cardiologists, neonatal, respiratory and general paediatricians about the condition and possibilities of treatment.

Objectives

To deliver a service for children and adults with pulmonary hypertension and to to lead a multi-disciplinary team of nurses and carers in a Trust to which these patients are referred and to be part of the National Clinical Network.

Entry Requirements

The trainee will have completed the three year core training programme in Paediatric Cardiology. The trainee will have a basic knowledge of cardiovascular anatomy and physiology and investigative techniques (including imaging) and be familiar with the natural history of the different types of cardiac anomaly, unoperated and operated. The recommendations for training presented in this document apply primarily to those who have entered via the core training programme in paediatric cardiology. For those trained initially in adult cardiology, some adjustments would be required to ensure a basic knowledge of paediatric cardiology-possibly by doing one year of the core training programme in paediatric cardiology.

Pulmonary hypertension can exist as Idiopathic Pulmonary Arterial Hypertension, is an integral part of paediatric cardiology and is a major component of other conditions such as respiratory and connective tissue disorders. Until the recent introduction of effective medical therapies patients were generally left to die. Now comprehensive investigation is mandatory, including cardiac catheterisation and the use of sophisticated imaging techniques in order to plan effective management , whether medical (monotherapy or combination therapy), surgical treatment or with increasing frequency, a combined medical and surgical approach. Trainees specialising in pulmonary hypertension are unlikely to be fully trained in cardiac catheterisation; the need for invasive assessment of pulmonary hypertension and its response to treatment as well as the occasional need for therapeutic catheterisation such as atrial septostomy will dictate collaborative working with the department's lead clinician for cardiac catheterisation. The current relentless introduction of new medicines makes an understanding of pharmacodynamics, pharmacokinetics and clinical trial methodology essential. The recognition of genetic mutations and deletions as causative in the pathogenesis of several forms of pulmonary hypertension indicate the need for instruction in this area, with a view to appropriate genetic counselling and screening of family members.

Duration of Training

It is envisaged that a two-year programme of clinical training will be necessary to achieve the curriculum competencies required to equip the trainee manage a Pulmonary Hypertension Service independently within their Trust and to play an active role in the UK Clinical Network. A nominal one year training post may be provided as part of a modular sub-speciality training scheme, to provide experience for those planning a career in general paediatric cardiology.

During this nominal 2 year period the trainee should retain a close involvement with the clinical activities of the department, including a regular on call commitment.

Research

It is necessary for the trainee to undertake research in this rapidly evolving field of medicine. Obtaining a higher degree is desirable but not essential.

To be able to carry out a comprehensive assessment and offer treatment for children and adults with pulmonary hypertension		
Knowledge	**Assessment Methods**	**GMP**
Making a comprehensive diagnostic and haemodynamic assessment	CbD, mini-CEX, *	1
Knowing indications for/against catheterisation/ septostomy and procedural risk(s)	CbD, mini-CEX, *	1,2
Understand physiology and clinical status	CbD, mini-CEX, *	1
Understand pathobiology	CbD, mini-CEX, *	1
Comprehension of various imaging techniques, knowing which to request and how to interpret data	CbD, mini-CEX, *	1
Know how to assess causality, and need for family screening, counselling	CbD, mini-CEX, *	1,3
Know how to use current therapies and how to safely explore use of potential therapies	CbD, mini-CEX, *	1
Know how to assess need for and timing of transplantation	CbD, mini-CEX, *	1
Knowledge of local and national professional and voluntary networks	CbD, mini-CEX	1,3
Know how to organise team-working to optimise patient care and individual input	CbD, mini-CEX, MSF	1,3
Know how to be part of a larger team and make a contribution to the wider world	CbD, mini-CEX, MSF	1,3
Skills		
To be proficient in:		
• Carrying out and interpreting cross sectional and transoesophageal echocardiography	DOPS	1
o Cardiac catheterisation and atrial septostomy		1
o Exercise testing		1
o Assessing pulmonary vascular disease		1
To be able to:	CbD, mini-CEX, MSF	
• Select with appropriate specialist advice the optimal imaging studies required		1
• Work with clinical geneticists specialising in PH		1,3
• Understand pharmacology of current and potential PH drugs and help design and run a clinical trial		1
• Make appropriate referral for lung/heart lung transplantation		1,3
• Organise community and palliative care		1,3
• Run a multi-disciplinary team of clinical nurse specialists,		1,3

trainees, pharmacists, psychologists		
• Collaborate with PH specialists, and with cardiologists and other specialists in own and other Trusts		1,3
Behaviours		
Appreciating others' skills and own limitations	CbD, mini-CEX	1,4
Acquiring vital skills in interpreting data of referred patients'	CbD, mini-CEX	1
Appreciate input of expert knowledge	CbD, mini-CEX	1,2
Appreciate necessity of practising evidence-based medicine and keeping up to date	CbD, mini-CEX	1,2
Understand cost/benefit of transplantation and appreciate family sensitivities	CbD, mini-CEX, PS	1,2,3
Appreciate necessity of optimising quality of life	CbD, mini-CEX, PS	1,2
Appreciate importance of an integrated care package and smooth team-working	CbD, mini-CEX, MSF, PS	1,3
Appreciate the importance of good communication and organisational skills and advice of others	mini-CEX, MSF	1,3

7. Transplantation Cardiology

Specialists who wish to subspecialise in heart failure and transplantation need a detailed knowledge of the underlying causes of heart failure as well as the medical and surgical approaches to treatment and the indications for and complications of transplantation.
It is envisaged that a two year programme of sub-specialist training will be necessary in order to achieve the competencies set out in the curriculum. Exposure to the sub-speciality as part of a modular training program is possible for a nominal one year period, for those planning a career in general paediatric cardiology. Additional practical skills such as invasive measurement of haemodynamics or myocardial biopsy will need to be acquired in collaboration with the clinical lead for cardiac catheterisation.
During this nominal 2 year period the trainee should retain a close involvement with the clinical activities of the department, including a regular on call commitment.

To be able to carry out comprehensive assessment and treatment of children and adolescents and adults with end stage congenital or acquired heart disease

Knowledge	Assessment Methods	GMP
Know:		
The natural history of congenital heart disease into adolescence and adult life	CbD, mini-CEX, *	1
The long-term sequelae of surgery for congenital heart disease	CbD, mini-CEX, *	1
The implications of operated and unoperated congenital heart disease for contraception and pregnancy	CbD, mini-CEX, *	1
The indications for non-invasive and invasive investigation in the adolescent and adult age group	CbD, mini-CEX, *	1
The indications for and techniques of therapeutic catheterisation in adults with congenital heart disease	CbD, mini-CEX, *	1
Skills		
Be able to:		
Devise and implement a comprehensive management plan	CbD, mini-CEX	1,3
Counsel patients with cardiac disease regarding employment	CbD, mini-CEX, PS	1,3
Counsel patients about exercise	CbD, mini-CEX, PS	1,3
Carry out transplant assessment cardiac catheterisation and endomyocardial biopsy	DOPS	1
Behaviours		
Appreciate the worries and concerns of adolescent and adult patients with congenital heart disease	mini-CEX, PS	1,3
Appreciate the need to shift responsibility for the decision making from the parents to the patient	CbD, mini-CEX, PS	1,3
Understand the need for assessment during pregnancy by the fetal cardiology service	CbD, mini-CEX	1

8. Advanced Echocardiography

It is assumed that three year core training in paediatric cardiology will equip the trainee with a sound knowledge of clinical echocardiography, which includes knowledge of the relevant cardiac anatomy, physiology and electrophysiology. Advanced echocardiography allows the trainee to achieve a higher level of expertise in some of the more advanced and newer techniques. It is expected that the trainee will become highly proficient in echocardiographic assessment of both cardiac morphology and function using modern echocardiographic modalities. These include high definition 2D echocardiography, real time 3D echocardiography, tissue Doppler imaging and speckle tracking. It is anticipated that this list will be supplemented in time by future developments in the field. It is envisaged that trainees will undertake audit and research during advanced echocardiography training.

A trainee who has completed 2 years of advanced echocardiography training should be equipped to lead an echocardiography department. Alternatively the training might be combined with another specialist area in a modular fashion.

To equip the trainee to practise all aspects of advanced clinical echocardiography		
Knowledge	**Assessment Methods**	**GMP**
Echo assessment of cardiac morphology and function, embracing the full spectrum of congenital and acquired heart disease	CbD, *	1
Understanding the physics of ultrasound and basic principles of echocardiographic techniques	CbD, *	1
Indications for the use of various echo modalities in children with congenital and acquired heart disease and and how to integrate this information with information from other investigative techniques	CbD, *	1
Application, strengths, limitations and contraindications of all individual echo techniques	CbD, *	1
Interpretation and reporting of echo findings	CbD, *	1
Skills		
Optimise and acquire echo images and curves which provide the best imaging / functional information	DOPS, CbD, mini-CEX	1
Competent independent operator in specific advanced echo modalities including:		
Transoesophageal echo. Able to guide interventional catheter procedures and assist intra operative decision making by timely acquisition and interpretation of imaging data	DOPS, CbD, mini-CEX	1,3
Intra operative echo. Includes transoesophageal and epicardial imaging with an understanding of their relative strengths	DOPS, CbD, mini-CEX	1,3
Tissue Doppler. Able to acquire, analyse, interpret and report data as appropriate	DOPS, CbD, mini-CEX	1
Three dimensional echo. Able to acquire, interpret and reformat datasets	DOPS, CbD, mini-CEX	1
Cardiac dyssynchrony evaluation	DOPS, CbD, mini-CEX	1

Be able to assess and interpret the importance of ventricular dyssynchrony	DOPS, CbD, mini-CEX	1
Able to interpret, report and present all imaging and quantification data in the context of the indications for further investigations or treatment, including surgical, catheter and electrophysiological intervention	CbD, mini-CEX	1,3
Able to set up and organise an echo service, patient flow organisation and prioritisation	CbD, mini-CEX	1,3
Behaviours		
Appreciate the importance of good communication skills with other members of the clinical team, patients and family members	MSF, PS	1,3
Appreciate the importance of providing timely, sufficiently detailed and accessible information	MSF, PS	1,3
Close rapport with surgical and interventional catheter teams. Flexible and timely response with regard to optimal use of echo during procedures	MSF, PS	1,3
Appreciate the importance of good organisational skills in running an echo service to ensure effective service delivery	MSF, PS	1,3

4 Learning and Teaching

4.1 The Training Programme

The organisation and delivery of postgraduate training is the statutory responsibility of the General Medical Council (GMC) which devolves responsibility for the local organisation and delivery of training to the deaneries. Each deanery oversees a "School of Medicine" which is comprised of the regional Specialty Training Committees (STCs) in each medical specialty. Responsibility for the organisation and delivery of specialty training in Paediatric Cardiology in each deanery is, therefore, the remit of the regional Paediatric Cardiology STC. Each STC has a Training Programme Director who coordinates the training programme in the specialty.

The sequence of training should ensure appropriate progression in experience and responsibility. The training to be provided at each training site is defined to ensure that, during the programme, the entire curriculum is covered and also that unnecessary duplication and educationally unrewarding experiences are avoided. However, the sequence of training should ideally be flexible enough to allow the trainee to develop a special interest.

Paediatric cardiology training will take place in an accredited training post in a regional paediatric cardiology centre. Some training programmes may incorporate periods of training at more than one centre, but all centres must be accredited. It may be necessary for a trainee to spend a dedicated period of time (e.g. 3 months) in a paediatric cardiac intensive care unit, if the trainee is unable to achieve the levels of skills in intensive care required in the curriculum in order to understand the fundamental principles and practice of postoperative care of children with congenital heart disease.

Subject to satisfactory training assessments and achievement of the curriculum competences, after 3 years of core paediatric cardiology training a trainee will be expected to continue for a further 2 years in an agreed programme of specialist area training.

As an approximate guide, the aspects of core training trainees might be expected to include in each year of training are:

Year 1

Formal audited reporting of ECGs
Formal audited analysis and reporting of ambulatory ECG recordings.
Formal audited reporting of Chest Xrays
Assessment of understanding of the reasons behind and analysis of the results of exercise testing
A foundation course in cardiac morphology
A foundation course in echocardiography
Advanced Paediatric Life Support training and certification
Attendance at 80% of National SAC approved training days for registrars
Basic training in trans-thoracic echocardiography

Year 2

Continued training in trans-thoracic echocardiography with development of skills required for the assessment of more complex cardiac defects.
Basic assessment of the understanding of reasons for performing and results of diagnostic cardiac catheterisation

Basic assessment of understanding of reasons behind and methods involved in performing cardiac pacing
Basic assessment of understanding of the reasons behind and methods involved in performing DC cardioversion
Basic training in transoesophageal echocardiography and intra-operative echocardiography
Attendance at 80% of National SAC approved training days for registrars

Year 3

An introduction to the practical aspects of fetal echocardiography and counselling of parents after fetal echocardiography
An introduction to the practical aspects of cardiac catheterisation and catheter based intervention.
An introduction to adult congenital heart disease
An introduction to invasive electrophysiology
Attendance at 80% of National SAC approved training days for registrars
Attendance at a management course
Practical temporary pacing, including in the post-operative patient.
Assessment of practical performance of DC cardioversion
Assessment of practical performance of echocardiography during balloon atrial septostomy, including the methodology behind the procedure
Assessment of practical performance of pericardiocentesis
Ongoing assessment of increasingly complex trans-thoracic and trans-oesophageal imaging, with evidence of improvement in image acquisition and interpretation

All trainees will take on a period of specialist area training after their core paediatric cardiology training competencies have been completed. The period of this further training is for an indicative two years, although for certain specialist area this training could be undertaken in a modular fashion to make up this time period. There are separate competency frameworks defined for each specialist area, and for each period of training within specialist area in which modular training is offered.

Specialist area training can be offered in a modular fashion. Modular training will be available in fetal cardiology, advanced imaging, advanced echocardiography, transplant cardiology, pulmonary hypertension. This will allow a trainee to spend an indicative one year in each of two separate specialist areas, with assessment made as per the competencies for the indicative first year of each. Cardiac catheterisation and intervention, electrophysiology and pacing and adult congenital heart disease training will usually need to undertaken for a full 2 years. There might be circumstances though where 1 year of training might be combined with another specialist area if deemed appropriate by the trainers and trainee. An example might be to undertake a year of pacing and electrophysiology with a year of heart failure and transplantation, for a trainee who might wish to offer a support role for the pacing service. The other specialist area modules could continue for a second year for trainees who wish to concentrate on a specific area e.g. 2 years of fetal cardiology for those that intend to lead a fetal cardiac service. The duration of that additional training will depend on achievement of the relevant competences. The decision on specialist area training will be made between the individual trainee and their educational supervisor, with external input via the ARCP process at the end of the second year of general paediatric cardiology training. Specialist area training will take place within approved training programmes and will be allocated through a competitive local process amongst trainees who are in their third year of general paediatric cardiology training. In the case of a trainee being unable to train in their chosen specialist area within their local centre, arrangements will be made between

national centres for a transfer to allow this specialist area training to be performed. For instance only 2 centres will be able to offer training in transplant cardiology (Newcastle and Great Ormond Street) and trainees from other deaneries who are suited to training in this specialist area would need to arrange for that training in one of the paediatric transplant centres. Specialist area trainees will continue to be involved in general paediatric cardiology, including on call commitments.

On completion of this additional specialist area training the trainee will be awarded a CCT in paediatric cardiology. Current legislation does not allow for specific CCTs in subspecialties; it will remain the role of consultant appointment committees, consultant job plans and local clinical governance arrangements to ensure that consultants practice within the limits of their training and expertise.

Trainees who wish to undertake specific specialist area training but who fail to compete successfully for a specific specialist area post after completion of general paediatric cardiology training will be allocated a specialist area post in their local centre. The opinions of the trainee will be taken into account but the final decision will rest with the educational supervisor and an external SAC member present at the ARCP. In cases of dispute, the SAC may be called on to review a trainee's suitability for a specific training scheme recognising the national need for specific specialist area expertise and the job opportunities in individual centres.

As per current legislation, following completion of competencies in higher specialist training and receipt of CCT, a trainee will be entitled to a period of 6 months grace at their original training centre, before being required to vacate their training position.

Clinical Experience

From the very beginning of specialist training, the trainee should be fully integrated into the clinical work of the training department. Throughout the training programme the trainee should participate in at least two outpatient clinics per week under consultant supervision and should see both new and follow-up patients. Continuing regular participation in inpatient management is vital at all stages of training. A regular on-call commitment, providing cover for paediatric cardiac patients, ideally as frequent as working hours directives allow, should be maintained throughout the period of training. Part of the inpatient and outpatient clinical work should include adolescent cardiology and an introduction to adult congenital heart disease. There should be an appropriate balance between clinical service and academic endeavours, with at least one half-day session a week protected from service requirements to allow the trainee to carry out audit and research and to establish a regular programme of self-education.

Training in Fetal Cardiology

General Paediatric cardiology training should include a basic introduction to fetal cardiology, in the third year of the training scheme, but those wishing to specialise in this field will usually require an additional 2 years of training to achieve the required competencies, obtaining concentrated experience in the practice of fetal echocardiography. It is possible to spend one indicative year training to a basic level in fetal cardiology, for those wanting a more general paediatric cardiology career. This might be combined with another year in one of the other imaging subspecialties. This training should take place in an educationally approved post in a centre with on site obstetric and fetal medicine services.

Training in Specialist Imaging Techniques (CT and MRI)

General paediatric cardiology training should include a basic introduction to the indications for and the interpretation of magnetic resonance imaging and CT scanning. This will include a basic understanding of how the procedures are carried out, in particular the issues around safety. There will be also some training in the way the images are analysed and the post-processing tools used, with basic training in the interpretation of the images and data obtained and how this relates to the management of patients.

Those wishing to specialise in this field will usually require an additional 2 years of training to achieve the curriculum competencies, obtaining concentrated experience in specialist imaging techniques. It is possible to spend one indicative year training to a basic level in specialist imaging, for those wanting a general paediatric cardiology career rather than a sub-specialist position. It would be sensible to follow this was a further year in one of the imaging sub specialties. This training should take place in an educationally approved post in a centre with on site paediatric cardiac services.

Training in Diagnostic and Therapeutic Cardiac Catheterisation

General paediatric cardiology training should include a basic introduction to the indications for and the interpretation of cardiac catheterisation and angiography. Those wishing to specialise in this field, however, will usually require an additional 2 years of training to achieve the curriculum competencies, obtaining concentrated experience in invasive techniques. This training should take place in an educationally approved post in a centre dealing with both paediatric and adult congenital cardiology services. The concept of life-long learning is of particular importance in the field of invasive cardiology; collaborative working with senior colleagues after being appointed as a consultant is likely to be in the best interest of the patient when dealing with infrequently performed or very complex interventions.

Training in Pacemaker Implantation and Electrophysiology

General paediatric cardiology training should include a basic introduction to the indications for pacemaker implantation and invasive electrophysiology. Those wishing to specialise in this field, however, will usually require an additional 2 years of training to achieve the curriculum competencies, obtaining concentrated experience in invasive techniques. This training should take place in an educationally approved post in a centre dealing with both paediatric cardiology and adult congenital cardiology services. In some cases, a period of up to 6 months may need to be spent in an adult cardiology unit in order to achieve the required competencies.

Training in Transplant Cardiology

General paediatric cardiology training should include a basic introduction to the care of patients with heart and heart/lung transplants. Those wishing to specialise in this field, however, will usually require an additional period of two years training in an accredited specialist centre to achieve the curriculum competencies, obtaining concentrated experience in transplant care. It is possible to spend one indicative year training to a basic level in transplant cardiology, for those wanting a general paediatric cardiology career rather than a sub-specialist position. In these circumstances a second year of training in pulmonary hypertension or one of the imaging subspecialties might be appropriate.

Training in Pulmonary Hypertension

Since pulmonary hypertension complicates the management of many patients with congenital heart disease it is essential that the core curriculum should enable the trainee to diagnose the condition, have an appreciation of the significance of their findings and the likely impact on the management of the cardiac lesion. Trainees should also be capable of recognising the disease in the normally formed heart. This will entail clinical training at the bedside, an awareness of the basic techniques necessary to make the diagnosis, competence in evaluating the results, appreciating the significance of their findings and an awareness of the drugs used to treat pulmonary hypertension. Knowledge of the management of acute post-operative pulmonary hypertension is an important aspect of general paediatric cardiology training.

Those wishing to specialise in this field will usually require an additional period of two years training in an accredited specialist centre to achieve the required curriculum competencies, obtaining concentrated experience. It is possible to spend one indicative year training to a basic level in pulmonary hypertension, for those wanting a general paediatric cardiology career rather than a sub-specialist position. A further year of training in transplant cardiology or an imaging specialist area would be appropriate.

Training in Adult Congenital Heart Disease

Details of training in adult congenital heart disease are included in this document as there is considerable overlap with training in paediatric cardiology. Guidelines for those entering specialist training in adult congenital heart disease from a general adult cardiology training programme are also set out in the curriculum for specialist training in adult cardiology.

- Entry from Paediatric Cardiology Programme

General paediatric cardiology training should include a basic introduction to the care of adolescents and adults with congenital heart disease, but those wishing to specialise in the field will usually require an additional 2 years training to achieve the required curriculum competencies, obtaining concentrated experience in adult congenital heart disease. This period should include 6 months attachment to general adult cardiology. In most centres it should be possible for this adult cardiology attachment to run concurrently with adult congenital cardiology training. An additional year, out of programme, to obtain experience in research or in additional specialist area training such as specialist imaging, therapeutic catheterisation or electrophysiology, is desirable.

- Entry from Adult Cardiology Programme

After the first 3 years in general cardiology training (which will include 1 year with additional training in general internal medicine) trainees wishing to specialise in adult congenital heart disease will usually require an additional 2 year period of training in a centre for tertiary referral of adults (and, ideally, children) with congenital heart disease to achieve the required curriculum competencies. The training will cover all aspects of congenital heart disease and must include a period of a minimum of 6 months in the care of infants and children with heart disease. This period in paediatric training will be arranged by the deanery providing the adult congenital training.

As in the current adult cardiology training programme, a 6th year will normally be derived from a period of research or perhaps training in a related specialist area, such as specialist imaging, therapeutic catheterisation or electrophysiology.

Advanced Echocardiography

Trainees are expected to acquire a sound knowledge of clinical two dimensional and Doppler echocardiography during the core training period. A further period of up to 2 years training in advanced echocardiography is undertaken with an emphasis on the acquisition of skills in the increasing number of modern echocardiographic modalities. A full 2 years training is likely to equip the trainee to lead and develop an echocardiographic service. Alternatively it might be undertaken as a year module of specialist area training, perhaps combined with a year of one of the other imaging subspecialties. As many of these newer echocardiographic techniques are better developed in adult echocardiographic departments, it may be useful for the trainee to develop these skills in the adult service, including patients with adult acquired heart disease.

4.2 Teaching and Learning Methods

The curriculum will be delivered through a variety of learning experiences. Trainees will learn from practice, clinical skills appropriate to their level of training and to their attachment within the department.

Trainees will achieve the competencies described in the curriculum through a variety of learning methods. There will be a balance of different modes of learning from formal teaching programmes to experiential learning 'on the job'. The proportion of time allocated to different learning methods may vary depending on the nature of the attachment within a rotation.

This section identifies the types of situations in which a trainee will learn.

Learning with Peers - There are many opportunities for trainees to learn with their peers. The nationally organised, SAC approved training days for paediatric cardiology registrars provide an excellent basis for training and allow peer-to-peer supportive learning. Local postgraduate teaching opportunities allow trainees of varied levels of experience to come together for small group sessions.

Work-based Experiential Learning - The content of work-based experiential learning is decided by the local faculty for education but includes active participation in:

- Medical clinics including specialty clinics. After initial induction, trainees will review patients in outpatient clinics, under direct supervision. The degree of responsibility taken by the trainee will increase as competency increases. As experience and clinical competence increase trainees will assess 'new' and 'review' patients and present their findings to their clinical supervisor.
- Paediatric cardiology on call
- Post on call consultant ward-rounds
- Personal ward rounds and provision of ongoing clinical care of inpatients. Every patient seen, on the ward or in out-patients, provides a learning opportunity, which will be enhanced by following the patient through the course of their illness: the experience of the evolution of patients' problems over time is a critical part both of the diagnostic process as well as management. Patients seen should provide the basis for critical reading and reflection of clinical problems.
- Consultant-led ward rounds. Every time a trainee observes another doctor, consultant or fellow trainee, seeing a patient or their relatives there is an opportunity for learning. Ward rounds, should usually be led by a consultant and include feedback on clinical and decision-making skills.

- Multi-disciplinary team meetings. There are many situations where clinical problems are discussed with clinicians in other disciplines. These provide excellent opportunities for observation of clinical reasoning.

Trainees have supervised responsibility for the care of in-patients. This includes day-to-day review of clinical conditions, note keeping, and the initial management of the acutely ill patient with referral to and liaison with clinical colleagues as necessary. The degree of responsibility taken by the trainee will increase as competency increases. There should be appropriate levels of clinical supervision throughout training with increasing clinical independence and responsibility as learning outcomes are achieved (see Section 5: Feedback and Supervision).

Formal Postgraduate Teaching – The content of these sessions are determined by the local faculty of medical education and will be based on the curriculum. There are many opportunities throughout the year for formal teaching in the local postgraduate teaching sessions and at regional, national and international meetings.

Suggested activities include:
- A programme of formal bleep-free regular teaching sessions to cohorts of trainees (e.g. a weekly training hour of teaching within a Trust)
- Case presentations
- Journal clubs
- Research and audit projects
- Lectures and small group teaching
- Grand Rounds
- Clinical skills demonstrations and teaching
- Critical appraisal and evidence based medicine and journal clubs
- Joint specialty meetings
- Attendance at training programmes organised on a deanery or regional basis. Attendance at the National Training Days is expected and all trainees should attend 80% of the available training days.

Independent Self-Directed Learning -Trainees will use this time in a variety of ways depending upon their stage of learning. Suggested activities include:
- Reading, including web-based material
- Maintenance of personal portfolio (self-assessment, reflective learning, personal development plan)
- Audit and research projects
- Reading journals
- Achieving personal learning goals beyond the essential, core curriculum

Formal Study Courses - Time to be made available for formal courses is encouraged, subject to local conditions of service. Examples include management courses and communication courses.

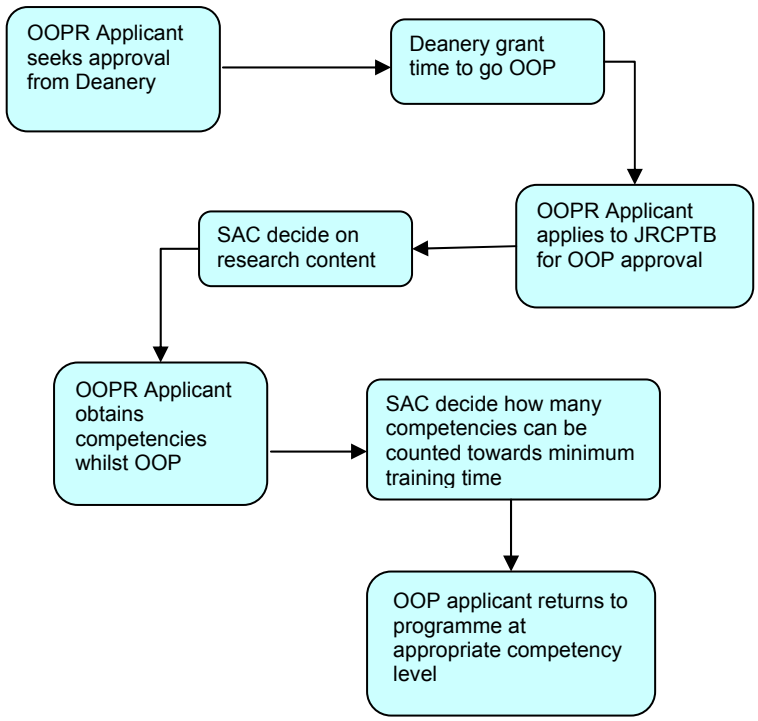
4.3 Research

Trainees who wish to acquire research competencies, in addition to those specified in their specialty curriculum, may undertake a research project as an ideal way of obtaining those competencies. For those in specialty training, one option to be considered is that of taking time out of programme to complete a specified project or research degree. Applications to research bodies, the deanery (via an OOPR form) and the JRCPTB (via a Research Application Form) are necessary steps, which are

the responsibility of the trainee. The JRCPTB Research Application Form can be accessed via the JRCPTB website. It requires an estimate of the competencies that will be achieved and, once completed, it should be returned to JRCPTB together with a job description and an up to date CV. The JRCPTB will submit applications to the relevant SACs for review of the research content including an indicative assessment of the amount of clinical credit (competence acquisition) which might be achieved. This is likely to be influenced by the nature of the research (eg entirely laboratory-based or strong clinical commitment), as well as duration (eg 12 month Masters, 2-year MD, 3-Year PhD). On approval by the SAC, the JRCPTB will advise the trainee and the deanery of the decision. The deanery will make an application to the GMC for approval of the out of programme research. All applications for out of programme research must be prospectively approved.

Upon completion of the research period the competencies achieved will be agreed by the OOP Supervisor, Educational Supervisor and communicated to the SAC, accessing the facilities available on the JRCPTB ePortfolio. The competencies achieved will determine the trainee's position on return to programme; for example if an ST3 trainee obtains all ST4 competencies then 12 months will be recognised towards the minimum training time and the trainee will return to the programme at ST5. This would be corroborated by the subsequent ARCP.

This process is shown in the diagram below:



Funding will need to be identified for the duration of the research period. Trainees need not count research experience or its clinical component towards a CCT programme but must decide whether or not they wish it to be counted on application to the deanery and the JRCPTB.

A maximum period of 3 years out of programme is allowed and the SACs will recognise up to 12 months towards the minimum training times.

5 Assessment

5.1 The Assessment System

The purpose of the assessment system is to:

- enhance learning by providing formative assessment, enabling trainees to receive immediate feedback, measure their own performance and identify areas for development;
- drive learning and enhance the training process by making it clear what is required of trainees and motivating them to ensure they receive suitable training and experience;
- provide robust, summative evidence that trainees are meeting the curriculum standards during the training programme;
- ensure trainees are acquiring competencies within the domains of Good Medical Practice*;*
- assess trainees' actual performance in the workplace;
- ensure that trainees possess the essential underlying knowledge required for their specialty;
- inform the Annual Review of Competence Progression (ARCP), identifying any requirements for targeted or additional training where necessary and facilitating decisions regarding progression through the training programme;
- identify trainees who should be advised to consider changes of career direction.

The integrated assessment system comprises a of workplace-based assessments and knowledge – base assessments. Individual assessment methods are described in more detail below.

Workplace-based assessments will take place throughout the training programme to allow trainees to continually gather evidence of learning and to provide trainees with formative feedback. They are not individually summative but overall outcomes from a number of such assessments provide evidence for summative decision making. The number and range of these will ensure a reliable assessment of the training relevant to their stage of training and achieve coverage of the curriculum.

5.2 Assessment Blueprint

In the syllabus (3.4) the "Assessment Methods" shown are those that are appropriate as **possible** methods that could be used to assess each competency. It is not expected that all competencies will be assessed and that where they are assessed not every method will be used.

5.3 Assessment methods

The following assessment methods are used in the integrated assessment system:

Examinations and certificates

- Advanced Paediatric Life Support Certificate (APLS) or European Paediatric Life Support Certificate (EPLS)

The small size of the specialty means that it is not feasible to run a full specialty certificate examination to assess knowledge. The specialty is currently planning to pilot a formative knowledge-based assessment method and, if successful, it is intended that this method will be used in the future.

Where there is a * in the syllabus this competency will be assessed, in the future, by a knowledge-based assessment method

Workplace-based assessments WPBAs

- Multi-Source Feedback (MSF)
- mini-Clinical Evaluation Exercise (mini-CEX)
- Direct Observation of Procedural Skills (DOPS)
- Case-Based Discussion (CbD)
- Patient Survey (PS)
- Audit Assessment (AA)
- Teaching Observation (TO)

These methods are described briefly below. More information about these methods including guidance for trainees and assessors is available in the ePortfolio and on the JRCPTB website www.jrcptb.org.uk. Workplace-based assessments should be recorded in the trainee's ePortfolio. The workplace-based assessment methods include feedback opportunities as an integral part of the assessment process, this is explained in the guidance notes provided for the techniques.

Multisource Feedback (MSF)
This tool is a method of assessing generic skills such as communication, leadership, team working, reliability etc, across the domains of Good Medical Practice. This provides objective systematic collection and feedback of performance data on a trainee, derived from a number of colleagues. 'Raters' are individuals with whom the trainee works, and includes doctors, administration staff, and other allied professionals. The trainee will not see the individual responses by raters, feedback is given to the trainee by the Educational Supervisor.

mini-Clinical Evaluation Exercise (mini-CEX)
This tool evaluates a clinical encounter with a patient to provide an indication of competence in skills essential for good clinical care such as history taking, examination and clinical reasoning. The trainee receives immediate feedback to aid learning. The mini-CEX can be used at any time and in any setting when there is a trainee and patient interaction and an assessor is available.

Direct Observation of Procedural Skills (DOPS)
A DOPS is an assessment tool designed to assess the performance of a trainee in undertaking a practical procedure, against a structured checklist. The trainee receives immediate feedback to identify strengths and areas for development.

Case based Discussion (CbD)
The CbD assesses the performance of a trainee in their management of a patient to provide an indication of competence in areas such as clinical reasoning, decision-making and application of medical knowledge in relation to patient care. It also serves as a method to document conversations about, and presentations of, cases by trainees. The CbD should include discussion about a written record (such as written case notes, out-patient letter, discharge summary). A typical encounter might be when presenting newly referred patients in the out-patient department.

Patient Survey (PS)
Patient Survey address issues, including behaviour of the doctor and effectiveness of the consultation, which are important to patients. It is intended to assess the trainee's performance in areas such as interpersonal skills, communication skills and

professionalism by concentrating solely on their performance during one consultation. At the moment this is being validated in adult medicine and so far it has not been evaluated in paediatrics. The patient survey will need modification to allow use with children and their family members and then will need validation.

Audit Assessment Tool (AA)
The Audit Assessment Tool is designed to assess a trainee's competence in completing an audit. The Audit Assessment can be based on review of audit documentation OR on a presentation of the audit at a meeting. If possible the trainee should be assessed on the same audit by more than one assessor.

Teaching Observation (TO)
The Teaching Observation form is designed to provide structured, formative feedback to trainees on their competence at teaching. The Teaching Observation can be based on any instance of formalised teaching by the trainee who has been observed by the assessor. The process should be trainee-led (identifying appropriate teaching sessions and assessors).

5.4 Decisions on Progress (ARCP)

The trainee must demonstrate that each of the educational objectives set out in the syllabus has been achieved. As each objective is attained, the trainee is deemed competent in that particular area of practice. The formal requirements of training are completed when competence has been demonstrated in all areas. It is anticipated that competence will be achieved quickly in certain areas (such as professional behaviour). Introduction to some aspects of training (such as fetal cardiology) will not usually commence until the third year of specialist training programme

The Annual Review of Competence Progression (ARCP) is the formal method by which a trainee's progression through her/his training programme is monitored and recorded. ARCP is not an assessment – it is the review of evidence of training and assessment. The ARCP process is described in A Reference Guide for Postgraduate Specialty Training in the UK (the "Gold Guide" – available from www.mmc.nhs.uk). Deaneries are responsible for organising and conducting ARCPs. The evidence to be reviewed by ARCP panels should be collected in the trainee's ePortfolio.

The ARCP Decision Aid is included in section 5.5, giving details of the evidence required of trainees for submission to the ARCP panels.

5.5 ARCP Decision Aid

	Core curriculum assessments for ALL trainees			Specialist area trainees	
Curriculum topics	**ST4**	**ST5**	**ST6**	**ST7**	**ST8**
General paediatric cardiology					
Expected level of clinical competence	Trainees should be competent in the initial assessment of patients presenting with some common cardiology problems. They should be competent in the management of a patient presenting with some acute cardiac problems	Trainees should be competent in the assessment of patients presenting with most of the common cardiology conditions Trainees should be competent in the assessment and management of most common paediatric cardiac emergencies	Trainees should be competent in the assessment of patients presenting with any of the common cardiology conditions Trainees should be competent in the assessment and management of all common paediatric cardiac emergencies		
Resuscitation	Valid APLS or EPLS certificate	Valid APLS or EPLS certificate	Valid APLS or EPLS certificate	Valid APLS or EPLS certificate	Valid APLS or EPLS certificate
Common Competencies					
Good Clinical Care Communication Skills Maintaining Good Medical Practice Maintaining Trust Working With Colleagues Teamwork And Leadership Skills Teaching And Educational Supervision Cross-Specialty Skills	Acceptable performance for level of training in MSF		Acceptable performance for level of training in MSF Satisfactory result from patient survey		Acceptable performance for level of training in MSF

	Core curriculum assessments for ALL trainees			Specialist area trainees	
Curriculum topics	**ST4**	**ST5**	**ST6**	**ST7**	**ST8**
Clinical Governance	Satisfactory result from MSF	1completed audits as assessed by Audit Assessment Tool	Satisfactory result from MSF. Total of 2 completed audits as assessed by AAT		Satisfactory result from MSF 3 completed audits
Structure Of The NHS And Principles Of Management		Evidence of awareness of and participation in some aspect of management systems: examples might include responsibility for organising rotas, teaching sessions or journal clubs.	Formal Management course completed successfully	Evidence of ongoing involvement in managerial issues within department	Evidence of understanding of both local and national management issues, assessed by performance in MSF
Discharge Planning		Satisfactory scores from 1 inpatient mini-CEXs			
Information use, evidence based management		Satisfactory scores from 1 CbDs			
Teaching		Evidence of participation in teaching of medical students, junior doctors and other AHPs. Assessed by Teaching Observation		Evidence of participation in teaching with results of students' evaluation of that teaching Evidence of understanding of the principles of adult education Assessed by Teaching Observation	Further evidence of continued involvement in departmental teaching assessed by MSF

	Core curriculum assessments for ALL trainees			Specialist area trainees	
Curriculum topics	**ST4**	**ST5**	**ST6**	**ST7**	**ST8**
Training Courses	Attendance at basic echocardiography course Attendance at cardiac morphology course Attendance of at least 80% of National SAC approved training days for registrars	Attendance of at least 80% of National SAC approved training days for registrars	Attendance of at least 80% of National SAC approved training days for registrars Attendance at management course	Attendance at specialist area specific courses	Attendance at specialist area specific courses
Supportive Evidence	Updated logbook of procedures	Updated logbook of procedures	Updated logbook of procedures	Updated logbook of procedures	Updated logbook of procedures
Educational Supervisors report	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory

Events giving concern	The following events occurring at any time may trigger review of trainee's progress and possible remedial training: issues of professional behaviour; poor performance in work-place based assessments; poor MSF performance; issues arising from supervisor report; issues of patient safety

INVESTIGATIONS AND PROCEDURES					
12 lead ECG, ECG with adenosine challenge	Satisfactory formally audited reporting of 20 ECGs in varying pathology		Fully satisfactory scores in 3 CbDs relating to arrhythmia and invasive electrophysiology		
Ambulatory ECG and cardiac event recording	Satisfactory formally audited reporting of 12 ambulatory ECGs in varying pathology				
Exercise tests	Fully satisfactory scores for all domains in 10 consecutive CbDs				
Chest X-Ray	Satisfactory formally audited reporting of 20 CXRs in varying pathology				
DC cardioversion		Fully satisfactory scores for 3 CbDs	Fully satisfactory scores for all domains in 2 consecutive DOPS		
Basic cardiac pacing		Fully satisfactory scores for 3 CbDs	Fully satisfactory scores for all domains in 2 additional, consecutive CbDs, including management of temporary post-operative pacing Fully satisfactory scores in 3 DOPS for insertion of temporary pacing electrodes (including those		

			inserted during EP study)		
Pericardiocentesis			Fully satisfactory scores for all domains in 2 consecutive DOPS		
Balloon atrial septostomy			Fully satisfactory scores in 3 DOPS for echocardiography during septostomy (achieved during first three years of training but assessed at end of ST6) Fully satisfactory scores in 1 CbD regarding the methodology of septostomy		
Trans-thoracic echocardiography	75% satisfactory scores for all domains in a minimum of 5 consecutive DOPS on normal hearts or simple cardiac anomalies	Fully satisfactory scores for all domains in a minimum of 5 further, consecutive DOPS on moderately complex patients	Fully satisfactory scores for all domains in a minimum of 5 further consecutive DOPS on increasingly complex patients. Improved image acquisition and interpretation		
Trans-oesophageal echocardiography and intra-operative echocardiography (TOE or epicardial echo)		75% satisfactory scores for all domains in a minimum of 3 consecutive DOPS	Fully satisfactory scores for all domains in a minimum of 3 further, consecutive DOPS on increasingly complex patients.		
Cardiac catheterisation		Fully satisfactory	Fully satisfactory		

		scores for a mnimum of 5 CbDs	scores for 5 DOPS in basic catheterisation procedures		
Cardiac MRI and Thoracic CT			Fully satisfactory scores for a minimum of 3 CbDs		
Fetal Cardiology			Fully satisfactory scores for a minimum of 3 CbDs including discussion of counselling issues 75% Satisfactory scores for 5 DOPS in practical fetal echocardiography		
Adult Congenital Cardiology			Fully satisfactory scores for a minimum of 3 CbDs relating to adult congenital cardiology		

SPECIALIST AREA TRAINING					
	ST4	**ST5**	**ST6**	**ST7**	**ST8**
Fetal cardiology				75% satisfactory scores in 10 consecutive DOPS and 2 mini-CEX Fully satisfactory scores for 5 CbDs including discussion of counselling issues	Fully satisfactory scores in 20 further consecutive DOPS and 5 further mini-CEX
Specialist imaging (CT and MRI)				Valid IRMER certificate 75% satisfactory results from 10 consecutive DOPS and 10 consecutive CbDs	Valid IRMER certificate Fully satisfactory results from 10 further, consecutive DOPS and 10 further, consecutive CbDs
Cardiac catheterisation				Valid IRMER certificate 75% satisfactory results from 10 consecutive DOPS and 10 consecutive CbDs	Valid IRMER certificate Fully satisfactory results from 20 further, consecutive DOPS, including more complex interventions
Cardiac pacing and electrophysiology				Valid IRMER certificate 75% satisfactory results from 10 consecutive DOPS and 10 consecutive CbDs	Valid IRMER certificate Fully satisfactory results from 20 further, consecutive DOPS
Adolescent and adult				75% satisfactory	Fully satisfactory

congenital heart disease				scores for 10 CbDs and 2 mini-CEX	results from 10 consecutive mini-CEX
Pulmonary hypertension				75% satisfactory scores for 10 CbDs and 2 mini-CEX	Fully satisfactory results from 10 consecutive mini-CEX
Transplantation cardiology				75% satisfactory scores for 10 CbDs and 2 mini-CEX	Fully satisfactory results from 10 consecutive mini-CEX
Advanced echocardiography				75% satisfactory results from 10 consecutive DOPS and 10 consecutive CbDs including intraoperative echo and advanced imaging techniques	Fully satisfactory results from 20 further, consecutive DOPS including intraoperative echo, advanced imaging techniques and dyssynchrony assessment

There is an option for trainees to undertake subspecialties in years ST7 and ST8 as modular training. This applies to advanced imaging, advanced echo, cardiac catheterisation, electrophysiology and pacing, fetal cardiology, adult congenital cardiology, pulmonary hypertension and transplantation cardiology. If training is being performed in this modular manner, with 2 sub-specialities studied for one year each, then the competency level of each should be assessed as per the decision grid for ST7 in that sub-speciality.

5.6 Penultimate Year Assessment (PYA)

The penultimate ARCP prior to the anticipated CCT date will include an external assessor from outside the training programme. JRCPTB and the deanery will coordinate the appointment of this assessor. This is known as “PYA”. Whilst the ARCP will be a review of evidence, the PYA will include a face to face component.

5.7 Complaints and Appeals

All workplace-based assessment methods incorporate direct feedback from the assessor to the trainee and the opportunity to discuss the outcome. If a trainee has a complaint about the outcome from a specific assessment this is their first opportunity to raise it.

Appeals against decisions concerning in-year assessments will be handled at deanery level and deaneries are responsible for setting up and reviewing suitable processes. If a formal complaint about assessment is to be pursued this should be referred in the first instance to the chair of the Specialty Training Committee who is accountable to the regional deanery. Continuing concerns should be referred to the Associate Dean.

6 Supervision and Feedback

6.1 Supervision

All elements of work in training posts must be supervised with the level of supervision varying depending on the experience of the trainee and the clinical exposure and case mix undertaken. Outpatient and referral supervision must routinely include the opportunity to personally discuss all cases if required. As training progresses the trainee should have the opportunity for increasing autonomy, consistent with safe and effective care for the patient.

Trainees will at all times have a named Educational Supervisor and Clinical Supervisor, responsible for overseeing their education. Depending on local arrangements these roles may be combined into a single role of Educational Supervisor.

The responsibilities of supervisors have been defined by GMC in the document “Operational Guide for the GMC Quality Framework”. These definitions have been agreed with the National Association of Clinical Tutors, the Academy of Medical Royal Colleges and the Gold Guide team at MMC, and are reproduced below:

Educational Supervisor
A trainer who is selected and appropriately trained to be responsible for the overall supervision and management of a specified trainee’s educational progress during a training placement or series of placements. The Educational Supervisor is responsible for the trainee’s Educational Agreement.

Clinical Supervisor
A trainer who is selected and appropriately trained to be responsible for overseeing a specified trainee’s clinical work and providing constructive feedback during a training placement. Some training schemes appoint an Educational Supervisor for each placement. The roles of Clinical and Educational Supervisor may then be merged.

The Educational Supervisor, when meeting with the trainee, should discuss issues of clinical governance, risk management and any report of any untoward clinical incidents involving the trainee. The Educational Supervisor should be part of the clinical specialty team. Thus if the clinical directorate (clinical director) have any concerns about the performance of the trainee, or there were issues of doctor or patient safety, these would be discussed with the Educational Supervisor. These processes, which are integral to trainee development, must not detract from the statutory duty of the trust to deliver effective clinical governance through its management systems.

Opportunities for feedback to trainees about their performance will arise through the use of the workplace-based assessments, regular appraisal meetings with supervisors, other meetings and discussions with supervisors and colleagues, and feedback from ARCP.

6.2 Appraisal

A formal process of appraisals and reviews underpins training. This process ensures adequate supervision during training, provides continuity between posts and different supervisors and is one of the main ways of providing feedback to trainees. All appraisals should be recorded in the ePortfolio

Induction Appraisal

The trainee and educational supervisor should have an appraisal meeting at the beginning of each post to review the trainee's progress so far, agree learning objectives for the post ahead and identify the learning opportunities presented by the post. Reviewing progress through the curriculum will help trainees to compile an effective Personal Development Plan (PDP) of objectives for the upcoming post. This PDP should be agreed during the Induction Appraisal. The trainee and supervisor should also both sign the educational agreement in the e-portfolio at this time, recording their commitment to the training process.

Mid-Point Review

This meeting between trainee and educational supervisor is mandatory (except when an attachment is shorter than 6 months), but is encouraged particularly if either the trainee or educational or clinical supervisor has training concerns or the trainee has been set specific targeted training objectives at their ARCP. At this meeting trainees should review their PDP with their supervisor using evidence from the e-portfolio. Workplace-based assessments and progress through the curriculum can be reviewed to ensure trainees are progressing satisfactorily, and attendance at educational events should also be reviewed. The PDP can be amended at this review.

End of Attachment Appraisal

Trainees should review the PDP and curriculum progress with their educational supervisor using evidence from the e-portfolio. Specific concerns may be highlighted from this appraisal. The end of attachment appraisal form should record the areas where further work is required to overcome any shortcomings. Further evidence of competence in certain areas may be needed, such as planned workplace-based assessments, and this should be recorded. If there are significant concerns following the end of attachment appraisal then the programme director should be informed

7 Managing Curriculum Implementation

7.1 Intended Use of Curriculum by Trainers and Trainees

This curriculum and ePortfolio are web-based documents which are available from the Joint Royal Colleges of Physicians Training Board (JRCPTB) website www.jrcptb.org.uk.

The educational supervisors and trainers can access the up-to-date curriculum from the JRCPTB website and will be expected to use this as the basis of their discussion with trainees. Both trainers and trainees are expected to have a good knowledge of the curriculum and should use it as a guide for their training programme.

Each trainee will engage with the curriculum by maintaining a portfolio. The trainee will use the curriculum to develop learning objectives and reflect on learning experiences.

7.2 Recording Progress

On enrolling with JRCPTB trainees will be given access to the ePortfolio for Paediatric Cardiology. The ePortfolio allows evidence to be built up to inform decisions on a trainee's progress and provides tools to support trainees' education and development.

The trainee's main responsibilities are to ensure the ePortfolio is kept up to date, arrange assessments and ensure they are recorded, prepare drafts of appraisal forms, maintain their personal development plan, record their reflections on learning and record their progress through the curriculum.

The supervisor's main responsibilities are to use ePortfolio evidence such as outcomes of assessments, reflections and personal development plans to inform appraisal meetings. They are also expected to update the trainee's record of progress through the curriculum, write end-of-attachment appraisals and supervisor's reports.

8 Curriculum Review and Updating

The specialty curriculum will be reviewed and updated with minor changes on an annual basis. The curriculum should be regarded as a fluid, living document and the SAC will ensure to respond swiftly to new clinical and service developments. In addition, the curriculum will be subject to three-yearly formal review within the SAC. This will be informed by curriculum evaluation and monitoring. The SAC will have available:

- The trainees' survey, which will include questions pertaining to their specialty (GMC to provide)
- Specialty-specific questionnaires (if applicable)
- Reports from other sources such as educational supervisors, programme directors, specialty deans, service providers and patients.
- Trainee representation on the Deanery STC and the SAC of the JRCPTB
- Informal trainee feedback during appraisal.

Evaluation will address:

- The relevance of the learning outcomes to clinical practice
- The balance of work-based and off-the-job learning
- Quality of training in individual posts
- Feasibility and appropriateness of on-the-job assessments in the course of training programmes
- Availability and quality of research opportunities
- Current training affecting the service

Evaluation will be the responsibility of the JRCPTB and GMC. These bodies must approve any significant changes to the curriculum.

Interaction with the NHS will be particularly important to understand the performance of specialists within the NHS and feedback will be required as to the continuing needs for that specialty as defined by the curriculum. It is likely that the NHS will have a view as to the balance between generalist and specialist skills, the development of generic competencies and, looking to the future, the need for additional specialist competencies and curricula. In establishing specialty issues which could have implications for training, the SAC will produce a summary report to discuss with the NHS employers and ensure that conclusions are reflected in curriculum reviews.

Trainee contribution to curriculum review will be facilitated through the involvement of trainees in local faculties of education and through informal feedback during appraisal and College meetings.

The SAC will respond rapidly to changes in service delivery. Regular review will ensure the coming together of all the stakeholders needed to deliver an up-to-date, modern specialty curriculum. The curriculum will indicate the last date of formal review monitoring and document revision.

9 Equality and Diversity

The Royal Colleges of Physicians will comply, and ensure compliance, with the requirements of equality and diversity legislation, such as the:

- Race Relations (Amendment) Act 2000
- Disability Discrimination Act 1995
- Human Rights Act 1998
- Employment Equality (Age) Regulation 2006
- Special Educational Needs and Disabilities Act 2001
- Data Protection Acts 1984 and 1998

The Federation of the Royal Colleges of Physicians believes that equality of opportunity is fundamental to the many and varied ways in which individuals become involved with the Colleges, either as members of staff and Officers; as advisers from the medical profession; as members of the Colleges' professional bodies or as doctors in training and examination candidates. Accordingly, it warmly welcomes contributors and applicants from as diverse a population as possible, and actively seeks to recruit people to all its activities regardless of race, religion, ethnic origin, disability, age, gender or sexual orientation.

Deanery quality assurance will ensure that each training programme complies with the equality and diversity standards in postgraduate medical training as set by GMC.

Compliance with anti-discriminatory practice will be assured through:

- monitoring of recruitment processes;
- ensuring all College representatives and Programme Directors have attended appropriate training sessions prior to appointment or within 12 months of taking up post;
- Deaneries must ensure that educational supervisors have had equality and diversity training (at least as an e learning module) every 3 years
- Deaneries must ensure that any specialist participating in trainee interview/appointments committees or processes has had equality and diversity training (at least as an e module) every 3 years.
- ensuring trainees have an appropriate, confidential and supportive route to report examples of inappropriate behaviour of a discriminatory nature. Deaneries and Programme Directors must ensure that on appointment trainees are made aware of the route in which inappropriate or discriminatory behaviour can be reported and supplied with contact names and numbers. Deaneries must also ensure contingency mechanisms are in place if trainees feel unhappy with the response or uncomfortable with the contact individual.
- monitoring of College Examinations;
- ensuring all assessments discriminate on objective and appropriate criteria and do not unfairly disadvantage trainees because of gender, ethnicity, sexual orientation or disability (other than that which would make it impossible to practise safely as a physician). All efforts shall be made to ensure the participation of people with a disability in training.