NEW CURRICULA

Advanced Training in Cardiology (Paediatrics & Child Health)

Curriculum standards

RACP Specialists. Together

About this document

The new Advanced Training in Cardiology (Paediatrics & Child Health) curriculum consists of curriculum standards and learning, teaching, and assessment (LTA) programs.

This document outlines the curriculum standards for Advanced Training in Cardiology (Paediatrics & Child Health) for trainees and supervisors. The curriculum standards should be used in conjunction with the Advanced Training in Cardiology (Paediatrics & Child Health) LTA programs.

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Program overview

Purpose of Advanced Training

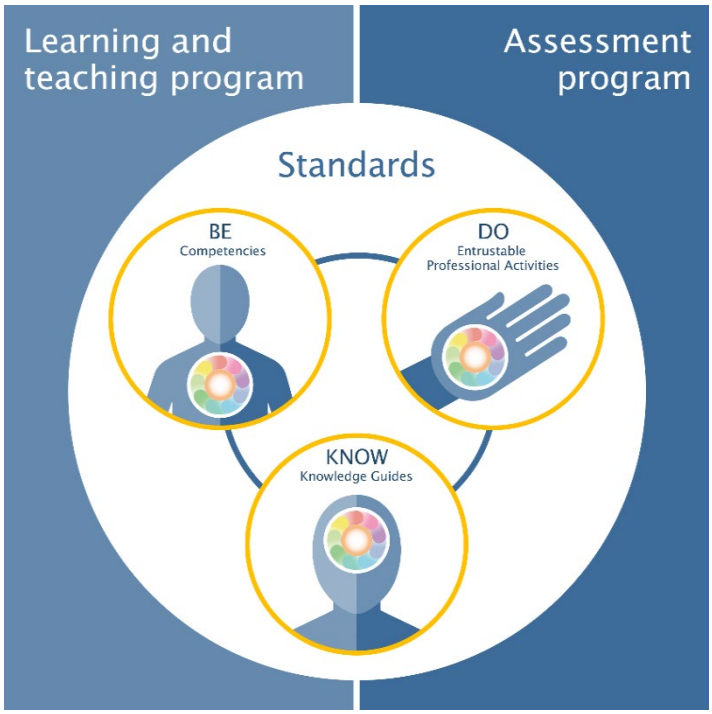
The RACP offers Advanced Training in 33 diverse medical specialties as part of Division, Chapter, or Faculty training programs.

The purpose of Advanced Training is to develop a workforce of physicians who:

- have received breadth and depth of focused specialist training, and experience with a wide variety of health problems and contexts
- are prepared for and committed to independent expert practice, lifelong learning, and continuous improvement
- provide safe, quality health care that meets the needs of the communities of Australia and Aotearoa New Zealand.



RACP curriculum model



The **RACP curriculum model** is made up of curricula standards supported by learning, teaching, and assessment programs.

Learning and teaching programs outline the strategies and methods to learn and teach curricula standards, including required and recommended learning activities.

Assessment programs outline the planned use of assessment methods to provide an overall picture of the trainee's competence over time.

The **curricula standards** outline the educational objectives of the training program and the standard against which trainees' abilities are measured.



- **Competencies** outline the expected professional behaviours, values and practices of trainees in 10 domains of professional practice.



- **Entrustable Professional Activities** (EPAs) outline the essential work tasks trainees need to be able to perform in the workplace.



- **Knowledge guides** outline the expected baseline knowledge of trainees.

Professional Practice Framework

The Professional Practice Framework describes 10 domains of practice for all physicians.



Learning, teaching, and assessment structure

The learning, teaching, and assessment (LTA) structure defines the framework for delivery and trainee achievement of the curriculum standards in the Advanced Training program.

Advanced Training is structured in three phases. These phases will establish clear checkpoints for trainee progression and completion.

1	**Specialty foundation**	• Orient trainees and confirm their readiness to progress in the Advanced Training program.
2	**Specialty consolidation**	• Continue trainees' professional development in the specialty and support progress towards the learning goals.
3	**Transition to Fellowship**	• Confirm trainees' achievement of the curriculum standards, completion of Advanced Training, and admission to Fellowship. • Support trainees' transition to unsupervised practice.



Figure 1: Advanced Training learning, teaching, and assessment structure

- An **entry decision** is made before entry into the program.
- A **progress decision**, based on competence, is made at the end of each phase of training.
- A **completion decision**, based on competence, is made at the end of the training program, resulting in eligibility for admission to Fellowship.



Advanced Training is a **hybrid time- and competency-based training program**. There is a minimum time requirement of full-time equivalent experience, and progression and completion decisions are based on evidence of trainees' competence.

Cardiology (Paediatrics & Child Health) specialty overview

Paediatric cardiologists are subspecialist paediatricians who diagnose and manage congenital and acquired cardiac and cardiovascular conditions and multisystem disorders.

It is a diverse field of paediatrics that involves working closely with specialist colleagues in multidisciplinary teams to provide patient- and family-centred care for perinates, infants, children, adolescents, and young adults who present with complex cardiac conditions across the developmental continuum.

A career in paediatric cardiology is both challenging and rewarding. It involves dealing with complex and technically demanding medical issues, and also provides much personal and professional satisfaction.

Paediatric cardiologists:

- **diagnose and manage patients with a broad range of cardiac and cardiovascular conditions**, including structural and congenital heart disease, acquired heart disease, rhythm disturbances, conditions affecting circulatory function, and other genetic or systemic disorders affecting the cardiovascular system.
- **provide care across a variety of settings** and tailor expertise to the context that meets the needs of each individual patient. This could range from delivering acute care in emergency and intensive care situations to managing the long-term care of patients with congenital or life-limiting cardiac conditions in inpatient and outpatient settings.
- **perform procedures and investigations** and apply the latest evidence-based technologies to assess, diagnose, treat, and manage cardiac conditions. In some settings, paediatric cardiologists may perform interventional procedures.
- **work closely with patients[1], their families and/or carers to manage and support their transition from paediatric through to adult care.** Paediatric cardiologists also establish enduring professional relationships with patients and their families, and provide appropriate advice and support to optimise the long-term management and outcomes of each individual patient.
- **have the opportunity to explore special clinical and academic interest areas**, including:
  - cardiac catheterisation and intervention
  - cardiac genetics
  - congenital heart disease (paediatrics and adult)
  - electrophysiology
  - fetal cardiology
  - heart failure and transplantation
  - imaging
  - intensive cardiac care.

[1] References to patients in the remainder of this document may include their families or carers.

In addition to their specialist expertise, paediatric cardiologists are strong problem solvers who work well under pressure. Day to day paediatric cardiologists use their organisational ability and communication skills to manage relationships with colleagues, patients, and their families, to:

- **coordinate patient care and work as an integral member of multidisciplinary teams.** Paediatric cardiologists work collaboratively with other health professionals to make balanced and objective clinical decisions, and ensure each patient receives the best available treatment and management. In many hospitals, paediatric cardiologists work alongside emergency and intensive care medicine physicians to fast-track and coordinate the care of children with congenital and acquired heart disease from the outset.
- **advocate for patients and communities.** Paediatric cardiologists apply a biopsychosocial approach to ensure the delivery of efficient, cost effective, and safe care for the benefit of their patients and communities, and advocate for the equitable distribution of resources to combat prevailing health inequities and improve the health outcomes of all patients. Many also provide outreach consulting services to regional and rural centres.
- **apply a scholarly approach to clinical decision making.** Paediatric cardiologists conduct and apply academic research to make evidence-based decisions that improve the treatment and management of their patients. Several academic and research opportunities exist within paediatric cardiology, particularly in the areas of clinical epidemiology and health systems performance.
- **contribute to workforce development.** Paediatric cardiology is a relatively small but highly skilled and collegiate workforce committed to maintaining lifelong excellence in practice through continuous professional development, and fostering the learning of others through mentoring, supervision, and teaching.

Cardiology (Paediatrics & Child Health) learning goals

The curriculum standards are summarised as 18 learning goals. The learning goals articulate what trainees need to be, do and know, and are assessed throughout training.

BE Competencies	1. Professional behaviours
DO EPAs	2. Team leadership 3. Supervision and teaching 4. Quality improvement 5. Clinical assessment and management 6. Management of transitions from paediatric to adult care 7. Acute paediatric cardiac care 8. Management of cardiac conditions from fetal to adolescence, including end-of-life care 9. Communication with patients 10. Prescribing 11. Procedures 12. Investigations
KNOW Knowledge guides	13. Scientific foundations of paediatric cardiology 14. Acute paediatric cardiac care 15. Structural heart disease, including valvular and congenital heart disease 16. Acquired heart disease 17. Arrhythmias 18. Genetic cardiac disorders

Curriculum standards



Competencies

Competencies outline the expected professional behaviours, values and practices that trainees need to achieve by the end of training.

Competencies are grouped by the 10 domains of the professional practice framework.

Competencies will be common across all or most training programs.

Learning goal 1: Professional behaviours

Medical expertise **Professional standard.** Physicians apply knowledge and skills informed by best available current evidence in the delivery of high quality, safe practice to facilitate agreed health outcomes for individual patients and populations.
Knowledge. Apply knowledge of the scientific basis of health and disease to the diagnosis and management of patients.
Synthesis. Gather relevant data via age- and context-appropriate means to develop reasonable differential diagnoses, recognising and considering interactions and impacts of comorbidities.
Diagnosis and management. Develop diagnostic and management plans that integrate an understanding of individual patient circumstances, including psychosocial factors and specific vulnerabilities, epidemiology, and population health factors in partnership with patients[2], families, or carers, and in collaboration with the health care team.

[2] References to patients in the remainder of this document may include their families and/or carers.

Communication



Professional standard. Physicians collate information, and share this information clearly, accurately, respectfully, responsibly, empathetically and in a manner that is understandable.

Physicians share information responsibly with patients, families, carers, colleagues, community groups, the public, and other stakeholders to facilitate optimal health outcomes.

Effective communication. Uses a range of effective and appropriate verbal, nonspeaking, and written communication techniques, including active listening.

Communication with patients, families, and carers. Use collaborative, effective, and empathetic communication with patients, families, and carers.

Communication with professionals and professional bodies. Use collaborative, respectful, and empathetic clinical communication with colleagues, other health professionals, professional bodies, and agencies.

Written communication. Document and share information about patients to optimise patient care and safety.

Privacy and confidentiality. Maintain appropriate privacy and confidentiality, and share information responsibly.

Quality and safety



Professional standard. Physicians practice in a safe, high quality manner within the limits of their expertise. Physicians regularly review and evaluate their own practice alongside peers and best practice standards and conduct continuous improvement activities.

Patient safety. Demonstrate a safety focus and continuous improvement approach to own practice and health systems.

Harm prevention and management. Identify and report risks, adverse events and errors to improve healthcare systems.

Quality improvement. Participate in quality improvement activities to improve quality of care and safety of the work environment.

Patient engagement. Enable patients to contribute to the safety of their care.



Teaching and learning

Professional standard. Physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and evaluating evidence. Physicians foster the learning of others in their profession through a commitment to mentoring, supervising, and teaching[3].

Lifelong learning. Undertake effective self-education and continuing professional development.
Self-evaluation. Evaluate and reflect on gaps in own knowledge and skills to inform self-directed learning.
Supervision. Provide supervision for junior colleagues and/or team members.
Teaching. Apply appropriate educational techniques to facilitate the learning of colleagues and other health professionals.
Patient education. Apply appropriate educational techniques to promote understanding of health and disease amongst patients and populations.



Research

Professional standard. Physicians support creation, dissemination and translation of knowledge and practices applicable to health.[2] They do this by engaging with and critically appraising research and applying it in policy and practice to improve the health outcomes of patients and populations.

Evidence-based practice. Critically analyse relevant literature and refer to evidence-based clinical guidelines, and apply these in daily practice.
Research. Apply research methodology to add to the body of medical knowledge and improve practice and health outcomes.

[2] Adapted from Richardson D, Oswald A, Chan M-K, Lang ES, Harvey BJ. Scholar. In: Frank JR, Snell L, Sherbino J, editors. The Draft CanMEDS 2015 Physician Competency Framework – Series IV. Ottawa: The Royal College of Physicians and Surgeons of Canada; 2015 March.

Cultural safety*

Professional standard. Physicians engage in iterative and critical self-reflection of their own cultural identity, power, biases, prejudices, and practising behaviours. Together with the requirement of understanding the cultural rights of the community they serve, this brings awareness and accountability for the impact of the physician's own culture on decision making and health care delivery. It also allows for an adaptive practice where power is shared between patients, family, whānau and/or community and the physician, to improve health outcomes.



Physicians recognise the patient and population's rights for culturally safe care, including being an ally for patient, family, whānau and/or community autonomy and agency over their decision making. This shift in the physician's perspective fosters collaborative and engaged therapeutic relationships, allows for strength-based (or mana-enhanced) decisions, and sharing of power with the recipient of the care, optimising health care outcomes.

Physicians critically analyse their environment to understand how colonialism, systemic racism, social determinants of health, and other sources of inequity have and continue to underpin the healthcare context. Consequently, physicians then can recognise their interfacing with, and contribution to, the environment in which they work to advocate for safe, more equitable and decolonised services and create an inclusive and safe workplace for all colleagues and team members of all cultural backgrounds[4].

Critical reflection. Engage in iterative and critical self-reflection and demonstrate cultural safety in the context of their own cultural identity, power, biases, prejudices and practising behaviours.

Allyship. Recognise the patient and population's rights to culturally-safe care, including being an ally for patient, family, whānau and/or community autonomy and agency over their decision-making.

Inclusive communication. Apply culturally-safe communication, acknowledging the sharing of power, and cultural and human rights to enable patients, families and whānau to engage in appropriate patient care decisions.

Culturally-safe environment. Contributes to a culturally-safe learning and practice environment for patients and team members. Respect patients may feel unsafe in the healthcare environment.

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*The RACP has adopted the Medical Council of New Zealand's definition of cultural safety:

Cultural safety can be defined as:

- *the need for doctors to examine themselves and the potential impact of their own culture on clinical interactions and healthcare service delivery.*
- *the commitment by individual doctors to acknowledge and address any of their own biases, attitudes, assumptions, stereotypes, prejudices, structures, and characteristics that may affect the quality of care provided.*
- *the awareness that cultural safety encompasses a critical consciousness where health professionals and healthcare organisations engage in ongoing self-reflection and self-awareness and hold themselves accountable for providing culturally safe care, as defined by the patient and their communities.*

[4] Curtis et al. "Why cultural safety rather than cultural competency is required to achieve health equity". International Journal for Equity in Health (2019) 18:174



Ethics and professional behaviour

Professional standard. Physicians' practice is founded upon ethics, and physicians always treat patients, their families, communities, and populations in a caring and respectful manner. Physicians demonstrate their commitment and accountability to the health and well-being of individual patients, communities, populations, and society through ethical practice.

Physicians demonstrate high standards of personal behaviour.

Beliefs and attitudes. Reflect critically on personal beliefs and attitudes, including how these may impact on patients' care.
Honesty and openness. Act honestly, including reporting accurately and acknowledging their own errors.
Patient welfare. Prioritise patients' welfare and community benefit above self-interest.
Accountability. Be personally and socially accountable.
Personal limits. Practise within their own limits and according to ethical and professional guidelines.
Self-care. Implement strategies to maintain personal health and wellbeing.
Respect for peers. Recognise and respect the personal and professional integrity, roles, and contribution of peers.
Interaction with professionals. Interact equitably, collaboratively, and respectfully with other health professionals.
Respect and sensitivity. Respect patients, maintain appropriate relationships, and behave equitably.
Privacy and confidentiality. Protect and uphold patients' rights to privacy and confidentiality.
Compassion and empathy. Demonstrate a caring attitude towards patients and endeavour to understand patients' values and beliefs.
Health needs. Understand and address patients', families', carers', and colleagues' physical and emotional health needs.
Medical and health ethics and law. Practise according to current community and professional ethical standards and legal requirements.



Judgement and decision making

Professional standard. Physicians collect and interpret information, and evaluate and synthesise evidence, to make the best possible decisions in their practice. Physicians negotiate, implement, and review their decisions and recommendations with patients, their families and carers, and other healthcare professionals.

Diagnostic reasoning. Apply sound diagnostic reasoning to clinical problems to make logical and safe clinical decisions.

Resource allocation. Apply judicious and cost effective use of health resources to their practice.

Task delegation. Apply good judgement and decision making to the delegation of tasks.

Limits of practice. Recognise their own limitations and consult others when required.

Shared decision making. Contribute effectively to team-based decision-making processes.



Leadership, management, and teamwork

Professional standard. Physicians recognise, respect, and aim to develop the skills of others, and engage collaboratively to achieve optimal outcomes for patients and populations.

Physicians contribute to and make decisions about policy, protocols, and resource allocation at personal, professional, organisational, and societal levels.

Physicians work effectively in diverse multidisciplinary teams and promote a safe, productive, and respectful work environment that is free from discrimination, bullying, and harassment.

Managing others. Lead teams, including setting directions, resolving conflicts, and managing individuals.

Wellbeing. Consider and work to ensure the health and safety of colleagues and other health professionals.

Leadership. Act as a role model and leader in professional practice.

Teamwork. Negotiate responsibilities within the health care team and function as an effective team member.

Health policy, systems, and advocacy

Professional standard. Physicians apply their knowledge of the nature and attributes of local, national, and global health systems to their own practices. They identify, evaluate, and influence health determinants through local, national, and international policy. Physicians deliver and advocate for the best health outcomes for all patients and populations.

Health needs. Respond to the health needs of the local community and the broader health needs of the people of Australia and Aotearoa New Zealand.
Prevention and promotion. Incorporate disease prevention, health promotion, and health surveillance into interactions with individual patients and their social support networks.
Equity and access. Work with patients and social support networks to address determinants of health that affect them and their access to needed health services or resources.
Stakeholder engagement. Involve communities and patient groups in decisions that affect them to identify priority problems and solutions.
Advocacy. Advocate for prevention, promotion, equity, and access to support patient and population health needs within and outside the clinical environment.
Resource allocation. Understand the factors influencing resource allocation, promote efficiencies and advocate to reduce inequities.

Entrustable Professional Activities

Entrustable Professional Activities (EPAs) outline the essential work tasks trainees need to be able to perform in the workplace without supervision by the end of training.



#	Theme	Title
2	Team leadership	Lead a team of health professionals
3	Supervision and teaching	Supervise and teach professional colleagues
4	Quality improvement	Identify and address failures in health care delivery
5	Clinical assessment and management	Clinically assess and manage the ongoing care of patients
6	Management of transitions from paediatric to adult care	Manage transitions of patient care from paediatric to adult medicine
7	Acute paediatric cardiac care	Assess and manage the care of acutely unwell paediatric cardiology patients
8	Management of cardiac conditions from fetal to adolescence, including end-of-life care	Manage and coordinate the longitudinal care of patients with complex cardiac conditions, including end-of-life
9	Communication with patients	Discuss diagnoses and management plans with patients
10	Prescribing	Prescribe therapies tailored to patients' needs and conditions
11	Procedures	Plan, prepare for, perform, and provide aftercare for important practical procedures
12	Investigations	Select, organise, and interpret investigations

Learning goal 2: Team leadership

Theme	Team leadership	
Title	**Lead a team of health professionals**	
Description	This activity requires the ability to: • prioritise workload • manage multiple concurrent tasks • articulate individual responsibilities, expertise, and accountability of team members • understand the range of team members' skills, expertise, and roles • acquire and apply leadership techniques in daily practice • collaborate with and motivate team members • encourage and adopt insights from team members • act as a role model	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• use evidence-based care to meet the needs of patients[5] or populations • assess and effectively manage clinical risk in various scenarios • demonstrate clinical competence and skills by effectively supporting team members	• demonstrate adequate knowledge of health care issues by interpreting complex information • assess the spectrum of problems to be addressed • apply medical knowledge to assess the impact and clinical outcomes of management decisions • provide coordinated and quality health care for populations or patients as a member of a multidisciplinary team
Communication	• provide support and motivate patients or populations and health professionals by effective communication • demonstrate a transparent, consultative style by engaging patients, families, carers, relevant professionals and/or the public in shared decision making • demonstrate rapport with people at all levels by tailoring messages to different stakeholders	• communicate adequately with colleagues • communicate adequately with patients, families or carers, and/or the public • respect the roles of team members
Quality and safety	• identify opportunities to improve care by participating in surveillance and monitoring of adverse events and near misses • identify activities within systems to reduce errors, improve patient and population safety, and implement cost effective change	• participate in audits and other activities that affect the quality and safety of patients' care • participate in multidisciplinary collaboration to provide effective health services and operational change • use information resources and electronic medical record technology where available

[5] References to patients in the remainder of this document may include their families or carers.

	• place safety and quality of care first in all decision making	
Teaching and learning	• regularly self-evaluate personal professional practice, and implement changes based on the results • actively seek feedback from supervisors and colleagues on their own performance • identify personal gaps in knowledge and skills, and engage in self-directed learning • maintain current knowledge of new technologies, health care priorities and changes of patients' expectations • teach competently by imparting professional knowledge • manage and monitor learner progress providing regular assessment and feedback	• accept feedback constructively, and change behaviour in response • recognise the limits of personal expertise, and involve other health professionals as needed • demonstrate basic skills in facilitating colleagues' learning
Research	• ensure that any protocol for human research is approved by a human research ethics committee, in accordance with the national statement on ethical conduct in human research	• understand that patient participation in research is voluntary and based on an appropriate understanding about the purpose, methods, demands, risks, and potential benefits of the research
Cultural safety	• demonstrate culturally safe relationships with professional colleagues and patients • demonstrate respect for diversity and difference • take steps to minimise unconscious bias, including the impact of gender, religion, cultural beliefs, and socioeconomic background on decision making	• demonstrate awareness of cultural diversity and unconscious bias • work effectively and respectfully with people from different cultural backgrounds
Ethics and professional behaviour	• promote a team culture of shared accountability for decisions and outcomes • encourage open discussions of ethical and clinical concerns • respect differences of multidisciplinary team members • understand the ethics of resource allocation by aligning optimal patients and organisational care • effectively consult with stakeholders to achieve a balance of alternative views • acknowledge personal conflicts of interest and unconscious bias • act collaboratively to resolve behavioural incidents and conflicts such as harassment and bullying	• support ethical principles in clinical decision making • maintain standards of medical practice by recognising the health interests of patients or populations as primary responsibilities • respect the roles and expertise of other health professionals • work effectively as a member of a team • promote team values of honesty, discipline, and commitment to continuous improvement • demonstrate understanding of the negative impact of workplace conflict
Judgement and decision making	• evaluate health services and clarify expectations to support systematic and transparent decision making	• monitor services and provide appropriate advice • review new health care interventions and resources

	• make decisions when faced with multiple and conflicting perspectives • ensure medical input to organisational decision making • adopt a systematic approach to analysing information from a variety of specialties to make decisions that benefit health care delivery	• interpret appropriate data and evidence for decision making
Leadership, management, and teamwork	• combine team members' skills and expertise in delivering patient care and/or population advice • develop and lead effective multidisciplinary teams by developing and implementing strategies to motivate others • build effective relationships with multidisciplinary team members to achieve optimal outcomes • ensure all members of the team are accountable for their individual practice	• understand the range of personal and other team members' skills, expertise, and roles • acknowledge and respect the contribution of all health professionals involved in patient care • participate effectively and appropriately in multidisciplinary teams • seek out and respect the perspectives of multidisciplinary team members when making decisions
Health policy, systems, and advocacy	• engage in appropriate consultation with stakeholders on the delivery of health care • advocate for the resources and support for health care teams to achieve organisational priorities • influence the development of organisational policies and procedures to optimise health outcomes • identify the determinants of health of the population, and mitigate barriers to access to care • promote the development and use of organisational policies and procedures • remove self-interest from solutions to health advocacy issues	• understand methods used to allocate resources to provide high quality care

Learning goal 3: Supervision and teaching

Theme	Supervision and teaching	
Title	**Supervise and teach professional colleagues**	
Description	This activity requires the ability to: • provide work-based teaching in a variety of settings • teach professional skills • create a safe and supportive learning environment • plan, deliver, and provide work-based assessments • encourage learners to be self-directed and identify learning experiences • supervise learners, such as trainees and medical students, in day-to-day work, and provide feedback • support learners to prepare for assessments	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• combine high-quality care with high-quality teaching • explain the rationale underpinning a structured approach to decision making • consider the patient-centric view during consultations • consider the population health effect when giving advice • encourage the learner to consider the rationale and appropriateness of investigation and management options	• teach learners using basic knowledge and skills
Communication	• listen and convey information clearly and considerately • establish rapport and demonstrate respect for junior colleagues, medical students, and other health professionals • communicate effectively when teaching, assessing, and appraising learners • actively encourage a collaborative and safe learning environment with learners and other health professionals • encourage learners to tailor communication as appropriate for different patients[6], such as younger or older people, and/or different populations	• observe learners to reduce risks and improve health outcomes

[6] References to patients in the remainder of this document may include their families or carers.

	• support learners to deliver clear, concise, and relevant information in both verbal and written communication	
Quality and safety	• support learners to deliver quality care while maintaining their own wellbeing • apply lessons learnt about patient safety by identifying and discussing risks with learners • assess learners' competence, and provide timely feedback to minimise risks to care • maintain the safety of patients and organisations involved with education, and appropriately identify and action concerns	• observe learners to reduce risks and improve health outcomes
Teaching and learning	• demonstrate knowledge of the principles, processes, and skills of supervision • provide direct guidance to learners in day-to-day work • work with learners to identify professional development and learning opportunities based on their individual learning needs • offer feedback and role modelling • participate in teaching, and supervise professional development activities • encourage self-directed learning and assessment • develop a consistent and fair approach to assessing learners • tailor feedback and assessment to learners' goals • seek feedback and reflect on own teaching by developing goals and strategies to improve • establish and maintain effective mentoring through open dialogue • support learners to identify and attend formal and informal learning opportunities • recognise the limits of personal expertise, and involve others appropriately	• demonstrate basic skills in the supervision of learners • not tailor learning, assessment, and feedback to individual learners • not match teaching and learning objectives clearly to outcomes • not encourage learners to be self-directed
Research	• clarify junior colleagues' research projects' goals and requirements, and provide feedback on the merits or challenges of proposed research • monitor the progress of learners' research projects regularly, and may review research projects prior to submission • support learners to find forums to present research projects	• guide learners with respect to the choice of research projects • ensure that the research projects planned are feasible and of suitable standards

	• encourage and guide learners to seek out relevant research to support practice	
Cultural safety	• role model a culturally appropriate approach to teaching • encourage learners to seek out opportunities to develop and improve their own cultural competence • encourage learners to consider culturally appropriate care of Aboriginal and Torres Strait Islander and Māori peoples in patients' management • consider cultural, ethical and religious values and beliefs in teaching and learning	• function effectively and respectfully when working with and teaching with people from different cultural backgrounds
Ethics and professional behaviour	• apply principles of ethical practice to teaching scenarios • act as a role model to promote professional responsibility and ethics among learners • respond appropriately to learners seeking professional guidance	• demonstrate professional values including commitment to high-quality clinical standards, compassion, empathy, and respect • provide learners with feedback to improve their experiences
Judgement and decision making	• prioritise workloads and manage learners with different levels of professional knowledge or experience • link theory and practice when explaining professional decisions • promote joint problem solving • support a learning environment that allows for independent decision making • use sound and evidence-based judgement during assessments and when communicating feedback to learners • escalate concerns about learners appropriately	• provide general advice and support to learners • use health data logically and effectively to investigate difficult diagnostic problems
Leadership, management, and teamwork	• maintain personal and learners' effective performances and continuing professional development • maintain professional, clinical, research and/or administrative responsibilities while teaching • help to shape organisational culture to prioritise quality and work safety through openness, honesty, shared learning, and continued improvement • create an inclusive environment in which learners feel part of the team	• demonstrate the principles and practice of professionalism and leadership in health care • participate in mentor programs, career advice, and general counselling
Health policy, systems, and advocacy	• advocate for suitable resources to provide quality supervision and maintain training standards	• integrate public health principals into teaching and practice

	• explain the value of health data in the care of patients or populations • support innovation in teaching and training

Learning goal 4: Quality improvement

Theme	Quality improvement	
Title	**Identify and address failures in health care delivery**	
Description	This activity requires the ability to: • identify, mitigate, and report actual and potential (near miss) errors • conduct system improvement activities • adhere to best practice guidelines • audit clinical guidelines and outcomes • contribute to the development of policies and protocols designed to protect patients[7] and enhance health care • monitor one's own practice and develop individual improvement plans	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• regularly review patients or population health outcomes to identify opportunities for improvement in delivering appropriate care • use standardised protocols to adhere to best practice and prevent the occurrence of wrong site, wrong-patient procedures • evaluate practice regularly to ensure it aligns with available evidence and guidelines • regularly monitor personal professional performance	• contribute to processes on identified opportunities for improvement • use local guidelines to assist patient care decision making
Communication	• support patients to have access to, and use, high-quality, easy-to-understand information about health care • assist patients' access to their health information, as well as complaint and feedback systems • discuss with patients any safety and quality concerns they have relating to their care • implement organisations' open disclosure policy	• demonstrate awareness of the evidence for consumer engagement and its contribution to quality improvement in health care • apply knowledge of how health literacy might affect the way patients or populations gain access to, understand, and use health information
Quality and safety	• demonstrate safety skills including infection control, adverse event reporting, and effective clinical handover	• demonstrate understanding of a systematic approach to improving the quality and safety of health care

[7] References to patients in the remainder of this document may include their families or carers.

	• participate in organisational quality and safety activities, including morbidity and mortality reviews and clinical incident reviews • use clinical audits and registries of data on patients' experiences and outcomes, and learn from incidents and complaints to improve health care	• participate in systems for surveillance and monitoring of adverse events and near misses, including reporting such events • ensure that identified opportunities for improvement are raised and reported appropriately
Teaching and learning	• translate quality improvement approaches and methods into practice • participate in professional training in quality and safety to ensure a contemporary approach to safety system strategies • supervise and manage the performance of junior colleagues in the delivery of safe, high-quality care	• work within organisational quality and safety systems for the delivery of clinical care • use opportunities to learn about safety and quality theory and systems
Research	• ensure that any protocol for human research is approved by a human research ethics committee, in accordance with the national statement on ethical conduct in human research	• understand that patient participation in research is voluntary and based on an appropriate understanding about the purpose, methods, demands, risks, and potential benefits of the research
Cultural safety	• undertake professional development opportunities that address the impact of cultural bias on health outcomes	• communicate effectively with patients from culturally and linguistically diverse backgrounds
Ethics and professional behaviour	• contribute to developing an organisational culture that enables and prioritises patients' safety and quality of care	• comply with professional regulatory requirements and codes of conduct
Judgement and decision making	• use decision-making support tools, such as guidelines, protocols, pathways, and reminders • analyse and evaluate current care processes to improve health care	• access information and advice from other health care practitioners to identify, evaluate, and improve patients' care management
Leadership, management, and teamwork	• support multidisciplinary team activities to lower risk of harm, and promote multidisciplinary education programs • actively involve clinical pharmacists in the medication use process	• demonstrate attitudes of respect and cooperation among members of different professional teams • partner with clinicians and managers to ensure that patients receive appropriate care and information on their care
Health policy, systems, and advocacy	• support the development, implementation, evaluation, and monitoring of governance processes • maintain a dialogue with service managers about issues that affect patient care • help to shape an organisational culture that prioritises safety and quality through openness, honesty, learning, and quality improvement	• contribute to relevant organisational policies and procedures

Learning goal 5: Clinical assessment and management

Theme	**Clinical assessment and management**
Title	**Clinically assess and manage the ongoing care of patients**
Description	This activity requires the ability to: • identify and access sources of relevant information about patients • obtain patient histories • examine patients • synthesise findings to develop provisional and differential diagnoses • discuss findings with patients[8], families and/or carers • generate a management plan • present findings to other health professionals

Behaviours

Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• elicit an accurate, organised, and problem-focused medical history considering physical, psychosocial, and risk factors • perform a full physical examination to establish the nature and extent of problems • synthesise and interpret findings from the history and examination to devise the most likely provisional diagnoses via reasonable differential diagnoses • assess the severity of problems, the likelihood of complications and clinical outcomes • develop management plans based on relevant guidelines, and consider the balance of benefit and harm by taking patients' personal sets of circumstances into account • identify cardiac causes and underlying non-specific or undifferentiated paediatric presentations, including failure to thrive • oversee the perioperative care of patients having surgical correction of congenital heart defects, and recognise the postoperative and iatrogenic complications faced by patients with complex disease	• take patient-centred histories, considering psychosocial factors • perform accurate physical examinations • recognise and correctly interpret abnormal findings • synthesise pertinent information to direct the clinical encounter and diagnostic categories • develop appropriate management plans

[8] References to patients in the remainder of this document may include their families or carers.

	• assess the risk of non-cardiac surgery, and provide appropriate advice on perioperative management to avoid iatrogenic complications, especially special risks faced by patients with complex disease	
Communication	• communicate openly, listen, and take patients' concerns seriously, and give them adequate opportunity to question • provide information to patients, family, or carers to enable them to make informed decisions from various diagnostic, therapeutic, and management options • communicate clearly, effectively, respectfully, and promptly with other health professionals involved in patients' care • communicate sensitively regarding diagnoses and management plans, such as genetic family disorders	• anticipate, read, and respond to verbal and nonspeaking cues • demonstrate active listening skills • communicate patients' situations to colleagues, including senior clinicians
Quality and safety	• demonstrate safety skills including infection control, adverse event reporting, and effective clinical handover • recognise and effectively deal with aggressive and violent patient behaviours through appropriate training • obtain informed consent before undertaking any investigation or providing treatment, except in an emergency • ensure that patients are informed of the material risks associated with any part of the proposed management plans	• perform hand hygiene and take infection control precautions at appropriate moments • take precaution against assaults from agitated patients, and ensure appropriate care of patients • document history and physical examination findings, and synthesise with clarity and completeness
Teaching and learning	• set defined objectives for clinical teaching encounters, and solicit feedback on mutually agreed goals • regularly reflect and self-evaluate professional development • obtain informed consent before turning clinical activities into teaching opportunities, ensuring patients are aware of the risks	• set unclear goals and objectives for self-learning • self-reflect infrequently • deliver teaching considering learners' level of training
Research	• search for, find, compile, analyse, interpret, and evaluate information relevant to the research subject	• refer to guidelines and medical literature to assist in clinical assessments when required • demonstrate an understanding of the limitations of the evidence and the challenges of applying research in daily practice

Cultural safety	• acknowledge patients' beliefs and values, and how these might impact on health • demonstrate effective and culturally competent communication and care for Aboriginal and Torres Strait Islander and Māori peoples, and members of other cultural groups • use a professional interpreter, a health advocate, family member or community member to assist in communication with patients • use plain-language patient education materials, and be culturally and linguistically sensitive	• display respect for patients' cultures, and attentiveness to social determinants of health • display an understanding of at least the most prevalent cultures in society, and an appreciation of their sensitivities • appropriately access interpretive or culturally focused services
Ethics and professional behaviour	• demonstrate professional values including compassion, empathy, respect for diversity, integrity, honesty, and partnership to all patients • hold information about patients in confidence, unless the release of information is required by law or public interest • assess patients' capacity for decision making, and involve a proxy decision when appropriate	• demonstrate professional conduct, honesty and integrity • consider patients' decision-making capacity • identify patients' preferences regarding management, and the role of families in decision making • not advance personal interest or professional agendas at the expense of patient or social welfare
Judgement and decision making	• apply knowledge and experience to identify patients' problems, and make logical, rational decisions and act to achieve positive patients' outcomes • use a holistic approach to health, considering comorbidity, uncertainty, and risk • use the best available evidence for the most effective therapies and interventions to ensure quality care	• demonstrate clinical reasoning by gathering focused information relevant to patients' care • recognise personal limitations, and seek help when required in an appropriate way
Leadership, management, and teamwork	• present and discuss complicated patients' cases with the local medical and surgical teams to determine clinical courses • work effectively as a member of multidisciplinary teams to achieve patients' best health outcomes • demonstrate awareness of colleagues in difficulty, and work within the appropriate structural systems to support them while maintaining patient safety	• share relevant information with members of the health care team
Health policy, systems, and advocacy	• participate in health promotion, disease prevention and control, screening, and reporting notifiable diseases • evaluate the cost versus benefit of investigations	• identify and navigate components of the health system relevant to patients' care • identify and access relevant community resources to support patient care

Learning goal 6: Management of transitions from paediatric to adult care

Theme	**Management of transitions from paediatric to adult care**
Title	Manage transitions of patient care from paediatric to adult medicine
Description	This activity requires the ability to: • assess the timing and risks in transition from paediatric to adult care • assess patient[9], family and/or carer readiness for transition to adult care • create goals of transition in care specific to patients and their care needs • develop a transition plan in collaboration with patients, family and/or carers, and the medical team • summarise and document the clinical case for handover to the adult cardiologist

Behaviours

Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• assess patients' health literacy and developmental readiness for the demands of the adult care setting • assess adherence to treatment and monitoring plans • outline the key components of a transitional care program and the differences between the cultures of paediatric and adult care services, including the role of the adult physician • evaluate environmental and lifestyle health risks, and advocate for healthy lifestyle choices • anticipate, prevent, and manage changes in health status at the time of transition • adapt transition to meet individual patients' needs (e.g. if a patient has an intellectual disability)	• recognise the importance of prevention and early detection in clinical practice • assess psychosocial issues that may affect health and/or access to services • identify the ways in which chronic heart disease may impact on patients' lifestyles, such as contraception, pregnancies, employment, sport/leisure activities, and smoking • establish plans for ongoing care that include monitoring health status and managing adherence
Communication	• explain the impact of chronic heart disease on adolescent and young adults' leisure and work activities	• assess patients' understanding of their illness and health care needs, and work with them to increase their understanding • use communication skills and strategies that help patients make informed decisions • recognise and explore the worries and concerns of adolescent and adult patients with congenital heart disease • identify the need to shift responsibility for decision making from parents to patients, and work with patients on planning this

[9] References to patients in the remainder of this document may include their families or carers.

		• communicate sensitively with adolescents and young adults • recognise when it is appropriate to communicate with patients individually versus when it is appropriate to communicate with patients and their family members and/or carers • discuss with patients the differences between paediatric and adult care, such as the involvement of the parent or carer in decisions for adult patients versus paediatric patients
Quality and safety	• ensure patients are informed of risks associated with any part of the proposed management plans	• document patient history with clarity and completeness
Teaching and learning	• educate adolescents and young adults about their conditions and their impacts on their lives	• explain how patient education can empower young adults to take responsibility for their health
Cultural safety		• discuss topics including sexuality and contraception sensitively and in line with the cultural and religious beliefs of patients
Ethics and professional behaviour	• explain the role of GPs in patients' care, including relevant guidelines and how they apply	
Judgement and decision making	• identify the right time to start facilitating transition by considering the needs of individual patients • select the appropriate specialist to transition the patient to (e.g. general practitioner, general cardiologist, electrophysiologist, adult congenital specialist)	• consider whether a paediatric or adult setting may be more appropriate to conduct procedures and/or investigations
Leadership, management, and teamwork	• recognise and work collaboratively with other health care providers, including allied health workers and psychologists • ensure sufficient handover, including robust notes to convey complex history and/or rationale for past decisions	• recognise the importance of the multidisciplinary team in the management of adolescents and young adults • consider how to transition other specialties in which the patient is receiving care, into adult care
Health policy, systems, and advocacy	• connect patients with local or online peer support groups • contribute to the development of a written transition policy, which is a document that sets out principles, standards, and practices of how transitions are managed at the centre • advocate for resources to support efficient and more effective transitions	• apply local and international guidelines around transitions in congenital heart disease

Learning goal 7: Acute paediatric cardiac care

Theme	**Acute paediatric cardiac care**
Title	**Assess and manage the care of acutely unwell paediatric cardiology patients**
Description	This activity requires the ability to: • recognise instability and medical acuity in clinical presentations • provide assessment and initial stabilisation of airways, breathing, and circulation • elicit a history, including relevant past history, and perform relevant physical examinations • select and/or interpret appropriate investigations • develop and implement management plans

Behaviours

Professional practice framework domain	Ready to perform without supervision Expected behaviours of a trainee who can routinely perform this activity without needing supervision	Requires some supervision Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• recognise and manage typical and atypical cardiac presentations • use emergency monitoring equipment to timely identify cardiovascular abnormalities requiring urgent intervention • integrate and synthesise clinical information, haemodynamics, and results of investigations to assess clinical status • manage hemodynamic support and monitoring, including inotropes, anti-arrhythmics, and/or mechanical support	• recognise deterioration, and know how to escalate treatment • perform the sequence of cardiac resuscitation as per established protocols • use echocardiography to look for and/or provisionally diagnose abnormalities in cardiac structure or function • select and use diagnostic techniques to differentiate the underlying causes and precipitating factors of heart disease, and to evaluate cardiac function and pulmonary pressures
Communication	• convey information to other medical professionals involved in patients' care, including ICU, retrieval services, and other teams (e.g. neurology, general paediatrics) • support health professionals in remote settings to manage acutely unwell patients • support multidisciplinary teams to achieve the best health outcomes for acutely unwell patients	• convey information to families about diagnosis and prognosis clearly and compassionately
Quality and safety	• consider alternative strategies if complications arise or treatment is ineffective • participate in organisational quality and safety activities, including morbidity and mortality reviews and clinical incident reviews	• review and re-assess acute management plans

Teaching and learning	• demonstrate learning behaviour and skills in educating junior colleagues • regularly reflect and self-evaluate professional development • obtain informed consent before turning clinical activities into teaching opportunities, ensuring patients are aware of the risks	• self-reflect infrequently • set unclear goals and objectives for self-learning
Research	• search for and critically appraise the evidence to resolve clinical areas of uncertainty	• refer to evidence-based clinical guidelines • consult current research on investigations • demonstrate an understanding of the limitations of the evidence and the challenges of applying research in daily practice
Cultural safety		• understand the impact of cultural and psychosocial perspectives of the family
Ethics and professional behaviour	• engage appropriate colleagues in decision making (e.g. when withdrawing care or continuing to provide care despite patient/parent wishes)	• consider discrepancies between parents' or carers' wishes and decisions around what is best for patients based on their personal comfort and life expectancy
Judgement and decision making	• determine the setting of care appropriate for patients' current health care needs • balance risk, effectiveness, and priority of intervention in the presence of multiple comorbidities and/or other features of case complexity	• integrate best evidence and clinical expertise into decision making • participate in decisions to admit, discharge, or transfer patients from the ICU
Leadership, management, and teamwork	• participate in joint cardiac conferences to decide and agree on treatment approaches and appropriate locations for provisions of care across the network • integrate the skills of other health professionals in the acute care as relevant • determine the need and timing of referrals to other physicians	• present patient cases to health care teams, and understand the cardiac management plans • determine the need and timing of referrals to other specialists
Health policy, systems, and advocacy	• apply knowledge of local protocols and resources • apply the principles of efficient and equitable allocation of resources to meet individual, community, and national health needs	• identify and navigate components of the healthcare system relevant to patients' care

Learning goal 8: Management of cardiac conditions from fetal to adolescence, including end-of-life care

Theme	**Management of cardiac conditions from fetal to adolescence, including end-of-life care**
Title	**Manage and coordinate the longitudinal care of patients with complex cardiac conditions, including end-of-life**
Description	This activity requires the ability to: • develop management plans in consultation with patients[10], their families or carers • facilitate patients', families' or carers' self-management and self-monitoring • demonstrate problem-solving skills to manage chronic conditions, complications, disabilities, and comorbidities • liaise with other health professionals and team members to ensure continuity of care • engage with the broader health policy context, and responsibly use public resources • manage end-of-life care plans

Behaviours

Professional practice framework domain	Ready to perform without supervision Expected behaviours of a trainee who can routinely perform this activity without needing supervision	Requires some supervision Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• identify and address current clinical concerns as well as longer-term clinical objectives, as appropriate to patients' context • contribute to managing the care of patients from fetal through to adolescence • create accurate and appropriately prioritised problem lists in clinical notes, or as part of ambulatory care reviews • provide documentation on patients' presentations, management and progress, including key points of diagnosis and decision making • ensure that patients, families or carers contribute to their need assessments and care planning • monitor treatment outcomes, effectiveness, and adverse events • review goals of care and treatment plans with patients, family or carers if significant changes in patients' conditions or circumstances occur • recognise and manage the terminal phase in a timely way	• assess patients' knowledge, beliefs, concerns, and daily behaviours related to their chronic condition/disability and its management • contribute to medical record entries on histories, examinations, and management plans in an accurate and sufficient manner as a member of multidisciplinary teams

[10] References to patients in the remainder of this document may include their families or carers.

Communication	• encourage patients' access to self-monitoring devices and assistive technologies • communicate with multidisciplinary team members, and involve patients in that dialogue • help patients navigate the healthcare system by collaborating with other services, such as community health centres and consumer organisations, to improve access to care • link patients to specific community-based health programs and group education programs • identify opportunities to discuss end-of-life care, aligning it with patients', families' and carers' values and preferences • identify appropriate timing of palliative care involvement	• work in partnership with patients, and motivate them to comply with agreed care plans • wherever practical, meet patients' specific language and communication needs • facilitate appropriate use of interpreter services and translated materials • discuss appropriate support and bereavement care with family or carers
Quality and safety	• maintain up-to-date certification using innovative models of chronic disease care (e.g. telehealth and digitally integrated support services) • participate in quality improvement processes impacting on patients' ability to undertake normal activities of daily living • practice health care that maximises patient safety • adopt a systematic approach to the review and improvement of professional practice in the outpatient clinic setting • identify aspects of service provision that may be a risk to patients' safety • ensure patients are informed about fees and charges • review all deaths to determine the safety and quality of patients' end-of-life care and how it could be improved	• participate in continuous quality improvement processes and clinical audits on chronic disease management • identify activities that may improve patients' quality of life • address issues if patients' safety may be compromised • employ a systematic approach to improving the quality and safety of health care • participate in organisational quality and safety activities, including clinical incident reviews • collect and review data on the safety and effectiveness of end-of-life care delivery
Teaching and learning	• contribute to the development of clinical pathways for chronic diseases management based on current clinical guidelines • educate patients to recognise and monitor their symptoms, and undertake strategies to assist their recovery • evaluate own professional practice • demonstrate learning behaviour and skills in educating junior colleagues • contribute to the generation of knowledge	• use clinical practice guidelines for chronic diseases management • recognise the limits of personal expertise, and involve other professionals as needed to contribute to patients' care • use information technology appropriately as a resource for modern medical practice • encourage junior colleagues to participate in multidisciplinary case reviews, mortality and morbidity meetings and adverse event reviews

	• maintain professional continuing education standards relevant to the profession • recognise feelings of moral distress and burnout in self and colleagues	
Research	• prepare reviews of literature on patients' encounters to present at journal club meetings • search for and critically appraise the evidence to resolve clinical areas of uncertainty • obtain informed consent or other valid authority before involving patients in research • inform patients about their rights, the purpose of the research, the procedures to be undergone, and the potential risks and benefits of participation before obtaining consent	• search literature using Problem/ Intervention/Comparison/ Outcome (PICO) format • recognise appropriate use of review articles • refer to evidence-based clinical guidelines • consult current research on investigations
Cultural safety	• apply knowledge of the cultural needs of the community serving and how to shape service to those people • mitigate the influence of own culture and beliefs on interactions with patients and decision making • adapt practice to improve patient engagement and healthcare outcomes	• provide culturally safe chronic disease management • acknowledge the social, economic, cultural, and behavioural factors influencing health, both at individual and population levels
Ethics and professional behaviour	• share information about patients' health care, consistent with privacy laws and professional guidelines about confidentiality • use consent processes for the release and exchange of health information • identify and respect the boundaries that define professional and therapeutic relationships • respect the roles and expertise of other health professionals • comply with the legal requirements of preparing and managing documentation • demonstrate awareness of financial and other conflicts of interest • recognise the complexity of ethical issues related to human life and death, when considering the allocation of scarce resources	• share information between relevant service providers • acknowledge and respect the contribution of health professionals involved in patients' care • understand the responsibility to protect and advance the health and wellbeing of individuals and communities • maintain the confidentiality of documentation, and store clinical notes appropriately • ensure that the use of social media is consistent with ethical and legal obligations • respond appropriately to patients', family, carers' or colleagues' distress or concerns

Judgement and decision making	• implement stepped care pathways in the management of chronic diseases and disabilities • recognise patients' needs in terms of both internal resources and external support on a long-term care journey • integrate prevention, early detection, health maintenance, and chronic condition management, where relevant, into clinical practice • work to achieve optimal and cost effective patient care that allows maximum benefit from available resources	• recognise personal limitations, and seek help in an appropriate way when required • understand the appropriate use of human resources, diagnostic interventions, therapeutic modalities, and health care facilities
Leadership, management, and teamwork	• use a multidisciplinary approach across services to manage patients with chronic diseases and disabilities • develop collaborative relationships with patients, families or carers, and a range of health professionals • coordinate whole-person care through involvement in all stages of the patients' care journey • prepare for and conduct clinical encounters in an organised and efficient manner • work effectively as a member of multidisciplinary teams or other professional groups • ensure all important discussions with colleagues, multidisciplinary team members, and patients are appropriately documented • review discharge summaries, notes, and other communications written by junior colleagues • support colleagues who raise concerns about patient safety	• participate in multidisciplinary team care for patients with chronic diseases and disabilities, including organisational and community care, on a continuing basis appropriate to patient context • attend relevant clinical meetings regularly
Health policy, systems, and advocacy	• assess alternative models of health care delivery to patients with chronic diseases and disabilities • participate in initiatives for chronic diseases management to reduce hospital admissions and improve patients' quality of life • help patients access initiatives and services for patients with chronic diseases and disabilities • demonstrate capacity to engage in the surveillance and monitoring of the health status of populations in the outpatient setting • maintain good relationships with health agencies and services • apply the principles of efficient and equitable allocation of resources to meet individual,	• demonstrate awareness of initiatives and services available for patients with chronic diseases and disabilities, and knowledge of how to access them • identify common population health screening and prevention approaches

	community, and national health needs • consider location and urgency of care/treatment to ensure it is provided as close as possible to home, and that travel to and within the networked services only occurs when essential, ensuring timely care access and the best possible outcomes	

Learning goal 9: Communication with patients

Theme	Communication with patients	
Title	**Discuss diagnoses and management plans with patients**	
Description	This activity requires the ability to: • select a suitable context for discussions, and include family or carers and other team members • adopt a patient-centred perspective, including adjusting for cognition and disabilities • select and use appropriate modalities and communication strategies • structure conversations intentionally • negotiate mutually agreed management plans • verify patients'[11], families' or carers' understanding of information conveyed • develop and implement plans for ensuring actions occur • ensure conversations are documented	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• anticipate and be able to correct any misunderstandings patients may have about their conditions and/or risk factors • inform patients of all aspects of their clinical management and possible alternate approaches, including assessments and investigations, and give adequate opportunity to question or refuse interventions and treatments • seek to understand the concerns and goals of patients, and to plan management in partnership with them • provide information to patients to enable them to make informed decisions about diagnostic, therapeutic, and management options • recognise when to refer patients to psychological support services	• apply knowledge of the scientific basis of health and disease to the management of patients • demonstrate an understanding of clinical problems being discussed • formulate management plans in partnership with patients
Communication	• use appropriate communication strategies and modalities for communication, such as face-to-face, email or phone calls • elicit patients' views, concerns and preferences, promoting rapport • provide information to patients in plain language, avoiding jargon, acronyms, and complex medical terms	• select appropriate modes of communication • engage patients in discussions, avoiding the use of jargon • check patients' understandings of information • adapt communication styles in response to patients' age, developmental level, and cognitive, physical, cultural, socioeconomic, and situational factors

[11] References to patients in the remainder of this document may include their families or carers.

	• encourage questions and answer them thoroughly • ask patients to share their thoughts or explain management plans in their own words, to verify understanding • convey information considerately and sensitively to patients, and seek clarification if unsure of how best to proceed • treat children and young people respectfully, and listen to their views • recognise the role of family or carers and, when appropriate, encourage the young person to involve their family or carers in decisions about their care • explain diagnoses, incidental findings, management, and long-term impacts to parents and carers • explain the implications of different diagnoses and/or treatments for patients' current and future pregnancies • discuss options for pregnancies with known congenital heart defects sensitively with pregnant women and their family	• collaborate with patient liaison officers as required
Quality and safety	• discuss with patients their condition and available management options, including their potential benefits and harms • provide information to patients in a way they can understand before asking for their consent • consider young people's capacity for decision making and consent • recognise and take precautions where patients may be vulnerable, such as issues of child protection or self-harm • participate in processes to manage patient complaints	• inform patients of the risks associated with proposed management plans • treat information about patients as confidential
Teaching and learning	• discuss the aetiology of diseases and explain the purpose, nature, and extent of the assessment to be conducted • obtain informed consent or other valid authority before involving patients in teaching	• respond appropriately to information sourced by patients, and to patients' knowledge regarding their condition
Research	• provide information to patients that is based on evidence-based clinical guidelines • provide information to patients in a way they can understand before asking for their consent to participate in research	• refer to evidence-based clinical guidelines • demonstrate an understanding of the limitations of the evidence and the challenges of applying research in daily practice

	• obtain informed consent or other valid authority before involving patients in research	
Cultural safety	• demonstrate effective and culturally competent communication with Aboriginal and Torres Strait Islander and Māori peoples • effectively communicate with members of other cultural groups by meeting patients' specific language, cultural, and communication needs • when necessary, use qualified language interpreters or cultural interpreters to help to meet patients' communication needs • provide plain language and culturally appropriate written materials to patients when possible	• identify when to use interpreters • allow enough time for communication across linguistic and cultural barriers
Ethics and professional behaviour	• encourage and support patients to be well informed about their health, and to use this information wisely when they make decisions • encourage and support patients and, when relevant, their families or carers, in caring for themselves and managing their health • demonstrate respectful, professional relationships with patients • identify when it is appropriate to communicate with the patient versus their family or carer • prioritise honesty, patient welfare, and community benefit above self-interest • develop a high standard of personal conduct, consistent with professional and community expectations • support patients' rights to seek second opinions	• respect the preferences of patients • communicate appropriately, consistent with the context, and respect patients' needs and preferences • maximise patient autonomy, and support their decision making • avoid sexual, intimate, and/or financial relationships with patients • demonstrate a caring attitude towards patients • respect patients, including protecting their rights to privacy and confidentiality • behave equitably towards all, irrespective of gender, age, culture, social and economic status, sexual preferences, beliefs, contribution to society, illness related behaviours, or the illness itself • use social media ethically and according to legal obligations to protect patients' confidentiality and privacy
Leadership, management, and teamwork	• communicate effectively with team members involved in patients' care, and with patients, families or carers • discuss medical assessments, treatment plans and investigations with patients and primary care teams, and work collaboratively with them • discuss patients' care needs with team members to align them with appropriate resources • facilitate an environment in which all team members feel they can	• answer questions from team members • summarise, clarify, and communicate responsibilities of health care team members • keep health care team members focused on patient outcomes

	contribute and their opinion is valued • communicate accurately and succinctly, and motivate others on the health care team	
Health policy, systems, and advocacy	• help patients navigate the healthcare system by working in collaboration with other services, such as community health centres and consumer organisations • advocate for appropriate immunisations and vaccines while maintaining respect for the views and wishes of individual patients	• communicate with and involve other health professionals as appropriate

Learning goal 10: Prescribing

Theme	Prescribing	
Title	**Prescribe therapies tailored to patients' needs and conditions**	
Description	This activity requires the ability to: • take and interpret medication histories, including immunisation history • choose appropriate medicines based on an understanding of pharmacology, taking into consideration age, weight, comorbidities, potential drug interactions, risks, and benefits • communicate with patients[12], families or carers about the indications, benefits, and risks of proposed therapies • provide instruction on medication administration effects and side effects • monitor medicines for efficacy and safety • review medicines and interactions, and cease where appropriate • collaborate with pharmacists	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• identify the patients' disorder requiring pharmacotherapy • identify medicines that may cause a high risk of harm to children • consider nonpharmacologic therapies • consider age, gestation, weight, chronic disease status, allergies, and potential drug interactions when prescribing a new medication • demonstrate awareness of and mitigate calculation errors • optimise antimicrobial use • plan for follow-up and monitoring • demonstrate awareness of different formulations of common medications, and consider appropriate formulation and/or strength • recognise the impacts of age and metabolism on the absorption, distribution, and excretion of medicines	• be aware of potential side effects and practical prescription points, such as medication compatibility and monitoring in response to therapies • appropriately, safely, and accurately select medicines for common conditions • demonstrate understanding of the rationale, risk and benefit, side effects, contraindications, dosage, and drug interactions • identify and manage adverse events
Communication	• discuss and evaluate the risk and benefits of treatment options, making decisions in partnership with patients	• discuss and explain the rationale for treatment options with patients, families or carers

[12] References to patients in the remainder of this document may include their families or carers.

	• write clear, legible prescriptions in plain language, and include specific indications for the anticipated duration of therapy • demonstrate dosing and include written instructions, and ask the parent or carer to demonstrate where required • educate patients about the intended use, expected outcomes, and potential side effects for each prescribed medication, addressing the common and the rare but serious side effects at the time of prescribing, to improve patients' adherence to pharmacotherapy • outline strategies to assist with children taking unpalatable medicines • describe how the medication should and should not be administered, including any important relationships to food, time of day, and other medicines being taken • ensure patients' understanding by repeating back pertinent information, such as when to return for monitoring and whether therapy continues after this single prescription • identify patients' concerns and expectations, and explain how medicines might affect their everyday lives	• explain the benefits and burdens of therapies, considering patients' individual circumstances • write clearly legible scripts or charts using generic names of the required medication in full, including mg/kg/dose information and all legally required information • seek further advice from experienced clinicians or pharmacists when appropriate
Quality and safety	• review medicines regularly to reduce non-adherence, and monitor treatment effectiveness, possible side effects, and drug interactions, ceasing unnecessary medicines • use electronic prescribing tools where available, and access electronic drug references to prevent errors caused by drug interactions and poor handwriting • consider available evidence and experience prior to prescribing new medications • participate in clinical audits to improve prescribing behaviour, including an approach to polypharmacy and prescribing cascade • report suspected adverse events to the Advisory Committee on Medicines, and record it in patients' medical records	• check the dose before prescribing • monitor side effects of medicines prescribed • identify medication errors and institute appropriate measures • use electronic prescribing systems safely • rationalise medicines to avoid polypharmacy

Teaching and learning	• use continuously updated software for computers and electronic prescribing programs • ensure patients understand the management plan, including adherence issues • use appropriate guidelines and evidence-based medicine resources to maintain a working knowledge of current medicines, and keep up to date on new medicines	• undertake continuing professional development to maintain currency with prescribing guidelines • reflect on prescribing and seek feedback from a supervisor
Research	• critically appraise research material to ensure that any new medicine improves patient-oriented outcomes more than older medicines, and not just more than placebo • use sources of independent information about medicines that provide accurate summaries of the available evidence on new medicines	• make therapeutic decisions according to the best evidence • recognise where evidence is limited, compromised, or subject to bias or conflict of interest
Cultural safety	• explore patients' understanding of and preferences for pharmacological and nonpharmacological management • offer patients effective choices based on their expectations of treatment, health beliefs, and cost • interpret and explain information to patients at the appropriate level of their health literacy • anticipate queries to help enhance the likelihood of medicines being taken as advised • ensure appropriate information is available at all steps of the medicine management pathway	• appreciate patients' cultural and religious backgrounds, attitudes and beliefs, and how these might influence the acceptability of pharmacological and nonpharmacological management approaches
Ethics and professional behaviour	• provide information to patients about: » what the medicine is for » what it does » potential side effects » how to take it » when it should be stopped • make prescribing decisions based on good safety data when the benefits outweigh the risks involved • demonstrate understanding of the ethical implications of pharmaceutical industry marketing and funded research	• consider the efficacy of medicines in treating illnesses, including the relative merits of different pharmacological and nonpharmacological options • follow regulatory and legal requirements and limitations regarding prescribing • follow organisational policies on pharmaceutical representative visits and drug marketing
Judgement and decision making	• use a systematic approach to select treatment options • use medicines safely and effectively to get the best possible results	• consider the following factors for all medicines: » contraindications » cost to patients, families, and the community

	• choose suitable medicines only if medicines are considered necessary and benefit patients • prescribe medicines appropriately to patients' clinical needs, in doses that meet their individual requirements, for a sufficient length of time, with the lowest cost to them • evaluate new medicines in relation to their possible efficacy and safety profile for individual patients	» funding and regulatory considerations » generic versus brand medicines » interactions » risk-benefit analysis • recognise personal limitations, and seek help in an appropriate way when required
Leadership, management, and teamwork	• interact with medical, pharmacy and nursing staff to ensure safe and effective medicine use	• work collaboratively with pharmacists • participate in medication safety and morbidity and mortality meetings
Health policy, systems, and advocacy	• choose medicines in relation to comparative efficacy, safety, and cost effectiveness against medicines already on the market • prescribe for individual patients, considering history, current medicines, allergies, and preferences, ensuring resources are used wisely for the benefit of patients • advocate for appropriate immunisations and vaccines while maintaining respect for the views and wishes of individual patients	• prescribe in accordance with the organisational policy

Learning goal 11: Procedures

Theme	Procedures	
Title	**Plan, prepare for, perform, and provide aftercare for important practical procedures**	
Description	This activity requires the ability to: • ensure appropriate procedures are selected in partnership with patients[13], their families or carers • obtain informed consent • set up equipment, maintaining an aseptic field (if required) • perform procedures (if required) • manage unexpected events and complications during and after procedures (if required) • provide aftercare for patients • communicate aftercare protocols and instructions to patients and medical and nursing staff • interpret results and outcomes of procedures, including imaging and reports • communicate the outcome of procedures and associated investigations to patients, their families or carers • perform this activity across relevant settings (if required)	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• select procedures by assessing patient-specific factors, risks, benefits, and alternatives • confidently and consistently perform a range of common procedures • ensure team members are aware of all identified allergies/adverse reactions, and take precautions to avoid allergies/adverse reactions during procedures • ensure patients have complied with pre-procedure preparations • recognise and effectively manage complications arising during or after procedures • recognise and correctly interpret normal and abnormal findings of diagnostic procedures • perform a range of common procedures	• assess patients and identify indications for procedures • perform a range of common procedures • check for allergies and adverse reactions • consider risks and complications of procedures • interpret results of common diagnostic procedures • organise and document post procedure review of patients

[13] References to patients in the remainder of this document may include their families or carers.

Communication	• accurately document procedures in clinical notes, including informed consent, procedures requested and performed, reasons for procedures, medicines given, aseptic technique, and aftercare • explain procedures clearly to patients, families or carers, including reasons for procedures, potential alternatives, and possible risks, to facilitate informed choices • counsel patients sensitively and effectively, and support them to make informed choices • address patients' and family or carers' concerns relating to procedures, providing opportunities to ask questions • tailor language according to patients' age and capacity to understand • communicate effectively with team members, patients, families or carers prior to, during and after procedures • ensure team members are confident and competent in their assigned roles	• explain the process of procedures to patients without providing broader context • help patients, families or carers to choose procedures • communicate with members of procedural teams so all team members understand who each member is • discuss postprocedural care with patients, families or carers • complete relevant patients' documentation, and conduct an appropriate clinical handover
Quality and safety	• obtain informed consent or other valid authority before undertaking any procedure • set up all necessary equipment, and consistently use universal precautions and aseptic technique • confirm patients' identification and verify the procedure and, where appropriate, the correct site/side/level for the procedure • ensure that information on patients' consent forms match procedures to be performed • identify, document, and appropriately notify of any adverse event or equipment malfunction • demonstrate principles of physician safety, such as radiation safety in the cath lab or ergonomic position when performing echocardiograms	• provide information in a manner so that patients, families or carers are fully informed when consenting to any procedure • demonstrate an inconsistent application of aseptic technique • identify patients using approved patients' identifiers before any treatment or intervention is initiated • attempt to perform a procedure in an unsafe environment
Teaching and learning	• refer to and/or be familiar with relevant published procedural guidelines prior to undertaking procedures • organise or participate in in-service training on new technology • provide specific and constructive feedback and comments to junior colleagues • initiate and conduct skills training for junior staff	• participate in continued professional development • help junior colleagues to develop new skills • actively seek feedback on personal technique until competent

Cultural safety	• consider individual patients' cultural perceptions of health and illness, and adapt practice accordingly	• respect religious, cultural, linguistic, and family values and differences
Ethics and professional behaviour	• understand institution/department protocols and ethical practices and guidelines around performing procedures • if required to perform procedures, do so in accordance with institution/department protocols and ethical practices and guidelines • demonstrate knowledge of how cardiac and cardiac-related procedures are performed in their institution (e.g. heart lung bypass) • identify appropriate proxy decisionmakers when required • show respect for knowledge and expertise of colleagues • maximise patient autonomy in decision making	• perform procedures when adequately supervised • follow procedures to ensure safe practice
Judgement and decision making	• identify roles and optimal timings for diagnostic procedures • critically appraise information from assessments and evaluations of risks and benefits to prioritise patients on a waiting list • make clinical judgements and decisions based on available evidence • select the most appropriate and cost effective diagnostic procedures • adapt procedures in response to assessments of risks to individual patients • select appropriate investigations on the samples obtained in diagnostic procedures	• prioritise which patients receive procedures first (if there is a waiting list) • assess personal skill level, and seek help with procedures when appropriate • use tools and guidelines to support decision making • recommend suboptimal procedures for patients
Leadership, management, and teamwork	• explain critical steps, anticipated events, and equipment requirements to teams on planned procedures • provide staff with clear aftercare instructions, and explain how to recognise possible complications • identify relevant management options with colleagues according to their level of training and experience to reduce error, prevent complications, and support efficient teamwork • coordinate efforts, encourage others, and accept responsibility for work done	• ensure all relevant team members are aware that a procedure is occurring • discuss patients' management plans for recovery with colleagues
Health policy, systems, and advocacy	• discuss serious incidents at appropriate clinical review meetings • initiate local improvement strategies in response to serious incidents • use resources efficiently when performing procedures	• perform procedures in accordance with organisational guidelines and policies

Learning goal 12: Investigations

Theme	Investigations	
Title	**Select, organise, and interpret investigations**	
Description	This activity requires the ability to: • select, plan and use evidence-based clinically appropriate investigations • prioritise patients receiving investigations (if there is a waiting list) • evaluate the anticipated value of the investigation • work in partnership with patients[14], their families or carers to facilitate choices that are right for them • provide aftercare for patients (if needed) • interpret the results and outcomes of investigations • communicate the outcome of investigations to patients	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• choose evidence-based investigations, and frame them as an adjunct to comprehensive clinical assessments • assess patients' concerns, and determine the need for particular tests that are likely to result in overall benefits • develop plans for investigations, identifying their roles and timings • assess additional needs and impacts of sedation or general anaesthesia needed for procedures or investigations for paediatric patients (e.g. in the setting of developmental delay) • recognise and correctly interpret abnormal findings considering patients' specific circumstances, and act accordingly	• provide rationale for investigations • understand the significance of abnormal test results and act on these • consider patients' factors and comorbidities • consider age-specific reference ranges
Communication	• explain to patients the options, including the potential benefits, risks, burdens, and side effects, including the option to have no investigations • use clear and simple language, and check that patients understand the terms used and agree to proceed with proposed investigations • confirm patients understand the information they have been given, and the need for more information before deciding	• discuss the indications, risks, benefits, and complications of investigations with patients before ordering investigations • explain the results of investigations to patients • arrange investigations providing accurate and informative referrals, liaising with other services where appropriate

[14] References to patients in the remainder of this document may include their families or carers.

	• identify patients' concerns and expectations, and provide adequate explanations on the rationale for individual test ordering • use written material, visual aids or other aids that are accurate and up to date to support discussions with patients • explain findings or possible outcomes of investigations to patients, families or carers • give information that patients may find distressing in a considerate way	
Quality and safety	• identify adverse outcomes that may result from a proposed investigation, focusing on patients' individual situations	• consider safety aspects of investigations in planning • seek help with interpretation of test results for less common tests or indications, or for unexpected results • attempt to perform a procedure in an unsafe environment
Teaching and learning	• use appropriate guidelines, evidence sources, and decision support tools • participate in clinical audits to improve test ordering strategies for diagnoses and screening	• undertake professional development to maintain currency with investigation guidelines
Research	• provide patients with relevant information if a proposed investigation is part of a research program • obtain written consent from patients if the investigation is part of a research program	• refer to evidence-based clinical guidelines • consult current research on investigations
Cultural safety	• understand patients' views and preferences about any proposed investigation and the adverse outcomes they are most concerned about	• consider patients' cultural and religious backgrounds, attitudes, and beliefs, and how these might influence the acceptability of proposed investigations
Ethics and professional behaviour	• remain within the scope of the authority given by patients, except in emergencies • discuss with patients how decisions will be made once the investigation has started and the patient is not able to participate in decision making • respect patients' decisions to refuse investigations, even if their decisions may not be appropriate or evidence based • demonstrate awareness of escalation mechanisms in the event that decisions made by parents or carers pose the risk of harm to a minor (e.g. legal entities) • advise patients there may be additional costs, which patients may wish to clarify before proceeding	• identify appropriate proxy decision makers when required • choose not to investigate in situations where it is not appropriate for ethical reasons • practice within current ethical and professional frameworks • practice within own limits, and seek help when needed • involve patients in decision making regarding investigations, and obtain appropriate informed consent, including financial consent if necessary

	• explain expected benefits as well as potential burdens and risks of any proposed investigation before obtaining informed consent or other valid authority • demonstrate awareness of complex issues related to genetic information obtained from investigations, and subsequent disclosure of such information	
Judgement and decision making	• evaluate the costs, benefits, and potential risks of each investigation in a clinical situation • adjust the investigative path depending on test results received • consider whether patients' conditions may get worse or better if no tests are selected	• choose the most appropriate investigations for the clinical scenario in discussion with patients • recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• consider the role other members of the health care team might play, and what other sources of information and support are available • ensure results are checked in a timely manner, and take responsibility for following up on results and communicating them to other clinicians, patients, family members or carers	• demonstrate an understanding of what parts of an investigation are provided by different doctors or health professionals
Health policy, systems, and advocacy	• select and justify investigations regarding the pathological basis of disease, utility, safety, appropriateness, and cost • consider resource utilisation through peer review of testing behaviours	

Knowledge guides



Knowledge guides provide detailed guidance to trainees on the important topics and concepts trainees need to understand to become experts in their chosen specialty.

Knowledge guides are specialty specific.

The knowledge guides listed below have been developed for the Advanced Training in Cardiology (Paediatrics & Child Health) program.

#	Title
13	Scientific foundations of paediatric cardiology
14	Acute paediatric cardiac care
15	Structural heart disease, including valvular and congenital heart disease
16	Acquired heart disease
17	Arrhythmias
18	Genetic cardiac disorders

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have in-depth knowledge of the topics listed under each clinical sciences heading.

For the statistical and epidemiological concepts listed, trainees should be able to describe the underlying rationale, the indications for using one test or method over another, and the calculations required to generate descriptive statistics.

- Anatomy:
  - coronary anatomy/territory
  - morphology/sequential segmental analysis
  - ultrastructure of the cardiac myocyte
- Cardiovascular physiology:
  - altered physiological states:
    - circulatory support (e.g. VAD, ECMO)
    - exercise
    - pre- and postoperative changes
    - pregnancy
    - understanding of changes in structural and electrical heart disease, including biventricular and univentricular circulations
  - normal physiology:
    - BP homeostasis and circulatory control
    - cardiac cycle
    - cardiac mechanics and determinants of cardiac output
    - conduction pathway, including myocardial and pacemaker action potential
    - fetal circulation and transition to postnatal circulation
    - Frank-Starling mechanisms
    - normal haemodynamics/cardiac pressures
    - respiratory physiology, including ventilation, oxygen delivery, and its effects on cardiovascular performance
- Embryology
- Epidemiology of common cardiac conditions
- Nutrition/fluid management:
  - fluid and caloric requirements, including alternative types of feed (e.g. Monogen)
  - normal growth
- Pathophysiology of clinical findings, including murmurs, saturation differences, hepatomegaly, blood pressure and pulse volume discrepancies, JVP, peripheral oedema
- Pharmacology:
  - drug-drug interactions/contra-indications of medications
  - effects of non-cardiac medications on the heart function and rhythm
  - formulations of medications
  - monitoring of drug levels
  - pharmacodynamics and acquired heart diseases
  - screening for adverse effects
- Syndromes associated with cardiac lesions (e.g. DiGeorge, Down, and Marfan syndromes, Trisomy 18, VACTERL association)
- Understanding genetic inheritance of cardiac conditions
- Understanding of interventional and surgical procedures
- Understanding of paediatric cardiac intensive care management

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients[15], families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	• Cardiac examination, including consideration of age and development • History taking for cardiac presentations • Performing and interpretation of below investigations: » ambulatory BP monitoring » conduction system – ambulatory ECG monitoring, exercise stress test, pacemaker check » cross-sectional imaging (e.g. CT, MRI) » CXR » ECG » genetic testing » other imaging (e.g. V/Q, PET) » pathology (e.g. coagulation profile, CK, full blood count, inflammatory markers, troponin) » transthoracic and transoesophageal echocardiogram, including 2D, 3D, contrast echocardiogram, strain • Procedures: » balloon atrial septostomy » cardiac catheterisation (diagnostic and interventional) » DC cardioversion » drug challenges (e.g., adenosine) » electrophysiology studies and ablation » pericardiocentesis
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis, management, and outcomes.	• Consideration of research/education opportunities • Critical analyses of literature relating to scientific foundations of paediatric cardiology • Keeping up to date with current literature and guidelines and advanced technology in paediatric cardiology

[15] References to patients in the remainder of this document may include their families or carers.

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Chest pain
- Cyanosis:
  - » intermittent (e.g. cyanotic spells)
  - » persistent
- Dizziness/Syncope
- Heart failure
- Hypotension/Shock
- Murmur
- Palpitations/Tachycardia/ Bradycardia
- Sepsis

Conditions

- Acquired heart disease:
  - » infective endocarditis
  - » Kawasaki disease
  - » myocarditis, including COVID-19 myocarditis
  - » rheumatic heart disease
- Cardiomyopathies:
  - » dilated
  - » hypertrophic
- Heart disease associated with other diseases (e.g. connective tissue disorders, systemic lupus)
- Structural heart disease:
  - » duct-dependent lesions
- Pericarditis, including cardiac tamponade
- Primary cardiac arrythmias
- Pulmonary hypertension

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS

Advanced Trainees will understand these presentations and conditions.

Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.

Presentations

As above

Conditions

- Cardiomyopathies:
  - » arrhythmogenic
  - » left ventricular non-compaction
  - » restrictive
- Systemic hypertension

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

» recognise the clinical presentation
» identify relevant epidemiology, prevalence, pathophysiology, and clinical science
» take a comprehensive clinical history
» conduct an appropriate examination
» establish a differential diagnosis
» plan and arrange appropriate investigations
» consider the impact of illness and disease on patients[16] and their quality of life when developing a management plan

Manage

» provide evidence-based management
» prescribe therapies tailored to patients' needs and conditions
» recognise potential complications of disease and its management, and initiate preventative strategies
» involve multidisciplinary teams

Consider other factors

» identify individual and social factors and the impact of these on diagnosis and management

[16] References to patients in the remainder of this document may include their families or carers.

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Aetiology, pathophysiology, diagnosis and management of the various forms of congenital and acquired heart disease • Clinical features of heart disease at different ages, from newborn to young adult life • Compensatory mechanisms which maintain cardiovascular haemostasias • Complications of pharmacological treatment in patients with congenital heart disease • Indications for and pharmacology of drugs used in the treatment of congenital heart disease and heart failure • Natural history and clinical presentation of patients with congenital and acquired heart disease • Optimise nutrition and manage failure to thrive caused by heart failure • Physiology of control of cardiac output, including use of fluid and inotrope support to optimise cardiac output and tissue oxygen delivery • Principles of oxygen delivery and consumption • Understanding of electrical conduction
INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	**Investigations** • Angiographic and haemodynamic findings at cardiac catheterisation in congenital heart disease that presents with cardiac failure • Chest x-ray (CXR)/electrocardiogram (ECG) • Common blood tests as they relate to paediatric heart disease • Role of additional imaging modalities including CT, MRI, and nuclear medicine scans • Role of echocardiography in determining cause and impacts of haemodynamic lesions **Procedures** • Balloon atrial septostomy • Pericardiocentesis
PRINCIPLES OF MANAGEMENT Advanced Trainees will understand the principles of management of congenital and acquired heart disease, including medical therapies, catheters, and surgical interventions.	• Angiographic and haemodynamic findings at cardiac catheterisation • Know indications for and principles of extracorporeal life support (ECLS) • Know indications for extracorporeal mechanical support (ECMO) • Know indications for referral for cardiac transplantation • Know indications for referral for surgical interventions, including repair • Management of acute presentations of congenital and acquired heart disease (in particular duct-dependent lesions and medical management of heart failure) • Management of arrhythmias • Management of congenital heart disease with cardiac catheterisation (e.g. balloon valvuloplasty) • Understanding of common surgical procedures for the management of congenital heart disease

IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.	• Considerations of withdrawal of care (i.e. significant structural heart disease requiring palliation, including conversations with parents or carers) • Discuss problems of critically ill children with parents or carers, including long-terms risks and/or poor prognoses associated with genetic syndromes • Optimise care with involvement of intensive care and other specialties • Understand the trajectory of the underlying illness with and without treatment, e.g. long-term neurological impacts/outcomes including with and without treatment (i.e. risk to value ratio)

Learning goal 15 – Structural heart disease, including valvular and congenital heart disease

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Arrhythmias
- Cardiac arrest/sudden cardiac death
- Chest pain
- Cyanosis
- Genetic abnormality
- Heart failure
- Murmur
- Palpitations
- Seizures
- Stridor
- Swallowing difficulties
- Syncope/Pre-syncope

Conditions

- Cyanotic heart disease:
  - » Ebstein anomaly
  - » pulmonary atresia (PA)
  - » Tetralogy of Fallot (ToF)
  - » tricuspid atresia
  - » total anomalous pulmonary venous drainage (TAPVD)
  - » transposition of the great arteries (TGA)
- Non-cyanotic heart disease:
  - » coronary artery abnormalities:
    - ○ anomalous coronary artery origins, including left coronary artery from the pulmonary artery (ALCAPA)
    - ○ coronary artery aneurysms
    - ○ coronary artery fistulae
  - » obstructive lesions:
    - ○ aortic stenosis
    - ○ arch abnormalities:
      - ▪ coarctation of the aorta (CoA)
      - ▪ hypoplastic arch
      - ▪ interrupted aortic arch
      - ▪ vascular rings
    - ○ hypertrophic cardiomyopathy
    - ○ pulmonary stenosis
  - » shunt lesions:
    - ○ aortopulmonary window
    - ○ atrial septal defect (ASD)

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

- » recognise the clinical presentation
- » identify relevant epidemiology, prevalence, pathophysiology, and clinical science
- » take a comprehensive clinical history
- » conduct an appropriate examination
- » establish a differential diagnosis
- » plan and arrange appropriate investigations
- » consider the impact of illness and disease on patients[17] and their quality of life when developing a management plan

Manage

- » provide evidence-based management
- » prescribe therapies tailored to patients' needs and conditions
- » recognise potential complications of disease and its management, and initiate preventative strategies
- » involve multidisciplinary teams

Consider other factors

- » identify individual and social factors and the impact of these on diagnosis and management

[17] References to patients in the remainder of this document may include their families or carers.

	○ atrioventricular septal defect (AVSD) ○ patent ductus arteriosus (PDA) ○ ventricular septal defect (VSD)	
LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS Advanced Trainees will understand these presentations and conditions. Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.	**Conditions** • Absent pericardium • Complex/Single ventricle congenital heart disease • Heterotaxy/Isomerism • Primary cardiac tumours	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Understand the clinical features which can help differentiate these presentations from non-cardiac causes of similar presentations, including syncope and seizures • Understand the clinical presentations of structural heart disease, including the types presenting with chest pain, palpitations, or syncope • Understand the impact of lung pathology on cardiac presentation and severity • Understand the physiology and haemodynamic impact of structural cardiac defects	
INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	**Investigations** • CXR in the diagnosis and assessment of structural heart disease (abnormalities in cardiac position and cardiac silhouette) • Echocardiography in the diagnosis and assessment of haemodynamic impact of structural heart disease • Indications for and interpretations of cardiac event recorders, exercise tests, and Holter monitors • Interpretation of the 12-lead ECG findings, identifying substrate for cardiac arrhythmias, hypertrophy, and ischaemia • Screening of other systems (e.g. liver function tests) • Use and interpretation of additional imaging modalities, including CT, MRI, and nuclear medicine scanning **Procedures** • Indications for and risks of transoesophageal echocardiography in the diagnosis of congenital cardiac defects	

PRINCIPLES OF MANAGEMENT Advanced Trainees will understand the principles of management of congenital and acquired heart disease, including medical therapies, catheters, and surgical interventions.	• Catheter-based procedures: » type and timing of catheter interventions in the management of structural heart disease • Indications for referral for heart or heart-lung transplantation, and provision of local care following transplantation • Surgical procedures: » assess children with cardiac disease prior to non-cardiac surgery, and advise on fitness for such surgery and any precautions or cardiac treatment required » type and timing of surgical treatment of cardiac lesions
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.	• Explain the nature of the diagnosis to patients, and family or carers • Genetic risks (e.g. pregnancy planning) • Transitions to adulthood and longitudinal care

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Breathlessness
- Bradycardia/Tachycardia
- Chest pain
- Chorea
- Cyanosis
- Dizziness/Syncope
- Fever/Sepsis
- Heart failure
- Joint pain
- Laboratory/Radiological abnormalities
- Murmurs
- Palpitations/Arrhythmia
- Rash
- Systemic hypertension
- Weight loss/gain

Conditions

- Aortopathies:
  - » congenital
  - » genetic
- Cardiac complications of systemic disease (infections, malignancy, autoimmune)
- Cardiac trauma
- Cardiomyopathy:
  - » dilated
  - » hypertrophic
  - » restrictive
- Infective/Inflammatory:
  - » endocarditis
  - » myocarditis
  - » pericarditis
- Kawasaki disease
- Orthostatic hypotension/ Postural tachycardia
- Pulmonary hypertension (PHT)
- Rheumatic heart disease
- Systemic inflammatory disorder (e.g. COVID-19 related)

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

» recognise the clinical presentation
» identify relevant epidemiology, prevalence, pathophysiology, and clinical science
» take a comprehensive clinical history
» conduct an appropriate examination
» establish a differential diagnosis
» plan and arrange appropriate investigations
» consider the impact of illness and disease on patients[18] and their quality of life when developing a management plan

Manage

» provide evidence-based management
» prescribe therapies tailored to patients' needs and conditions
» recognise potential complications of disease and its management, and initiate preventative strategies
» involve multidisciplinary teams

Consider other factors

» identify individual and social factors and the impact of these on diagnosis and management

[18] References to patients in the remainder of this document may include their families or carers.

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS Advanced Trainees will understand these presentations and conditions. Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.	**Presentations** As above **Conditions** • Cardiac effects related to non-cardiac drugs, vaccination, other illnesses (e.g. drugs associated with long QT syndrome, COVID-19 vaccination) • Cardiomyopathies: » iatrogenic (e.g. post-chemotherapy) • Coronary disease and myocardial ischaemia • Infiltrative » primary/secondary malignancy • Ischaemic/perfusion abnormalities • Lipid abnormalities: » metabolic syndrome • Pulmonary embolus • Systemic hypertension (e.g. essential hypertension, hypertension associated with renal disease, drug-induced hypertension) • Vasculitis	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Aetiology and pathophysiology of acquired cardiac diseases • Diagnosis of acquired cardiac diseases » knowledge of current guidelines and recommendations • Investigation of aetiology of acquired cardiac diseases • Natural history and clinical presentation of patients with acquired cardiac diseases, in particular the clinical features at different ages from newborn to adult life	
INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk	**Investigations** • 6-minute walk test/Exercise stress testing • Ambulatory BP monitoring • ECG/Holter monitor • Imaging: » chest x-ray » MRI/CT » ultrasound (e.g. bubble study, echocardiogram, renal) • Laboratory tests: » coagulation profile » cultures/serology » full blood count, urea and electrolytes, liver function testing » inflammatory markers (CRP, ESR, PCT) » lipid profile » troponin » vitamin levels **Procedures** • Cardiac catheterisation	

and obtain informed consent where applicable.	
PRINCIPLES OF MANAGEMENT Advanced Trainees will understand the principles of management of congenital and acquired heart disease, including medical therapies, catheters and surgical interventions.	• Awareness of specific guidelines and recommendations of management (e.g. Kawasaki disease, rheumatic heart disease) • Medical management: » acute – suitability for life support (ventilation, ECMO) » chronic – including follow-up, preventative, screening of comorbidities, family screening » pharmacology – indications, monitoring, and side effects of pharmacological treatment in patients with acquired cardiac diseases • Surgical management: » perioperative management » surgical procedures
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.	• Incorporation of community resources and effective communication (e.g. community nurses, general practitioner, other specialists) • MDT approach to investigations, treatment, and managing care (e.g. infectious diseases, immunology, haematology, rheumatology) • Patient education of: » management, including lifestyle changes and compliance to treatment » prognosis and future treatment options (e.g. circulatory support/transplantation) » understanding of disease

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Atypical chest pain
- Bradycardia
- Cardiovascular collapse, including resuscitated cardiac arrest
- Drug overdose
- Family history of sudden cardiac death
- Fetal hydrops
- Irregular pulse
- Palpitations
- Syncope
- Tachycardia

Conditions

- Bradyarrhythmia:
  - » heart block
- Channelopathies (e.g. Brugada syndrome, CPVT, long QT syndrome)
- Ectopic beats:
  - » atrial
  - » ventricular
- Fetal arrhythmia
- Rhythm disturbances secondary to electrolyte abnormalities
- Tachyarrhythmias:
  - » broad complex tachycardia (e.g. ventricular tachycardia [VT])
  - » narrow complex tachycardia (e.g. supraventricular tachycardia [SVT], including AVRT)
- Wolff–Parkinson–White syndrome

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS

Advanced Trainees will understand these presentations and conditions.

Advanced Trainees will understand the resources that should be used to help manage patients

Presentations

As above

Conditions

- Atrial fibrillation
- Broad complex tachycardia (AVNRT, atrial flutter)
- Drug toxicity
- Refractory arrhythmias in acutely unwell patients
- Rhythm disturbances post-cardiac surgery

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

» recognise the clinical presentation
» identify relevant epidemiology, prevalence, pathophysiology, and clinical science
» take a comprehensive clinical history
» conduct an appropriate examination
» establish a differential diagnosis
» plan and arrange appropriate investigations
» consider the impact of illness and disease on patients[19] and their quality of life when developing a management plan

Manage

» provide evidence-based management
» prescribe therapies tailored to patients' needs and conditions
» recognise potential complications of disease and its management, and initiate preventative strategies
» involve multidisciplinary teams

Consider other factors

» identify individual and social factors and the impact of these on diagnosis and management

[19] References to patients in the remainder of this document may include their families or carers.

with these presentations and conditions.	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Mechanisms of arrhythmogenesis • Methods of presentation and clinical features of arrhythmias from fetal to adolescents • Normal electrophysiology of the heart • Pathogenesis, natural history, and prognosis of arrhythmias • Types of structural heart disease and types of cardiac surgery associated with abnormal cardiac rhythm, including long-term effects that may manifest in adulthood
INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	**Investigations** • Appropriate use of invasive and non-invasive cardiac event recorders • Exercise stress testing • Interpretation of 12-lead ECG findings, including how to interpret an ECG taken during an adenosine challenge • Interpretation of 24-hour Holter monitoring, as well as event monitors and implantable devices **Procedures** • External cardioversion • Indications for electrophysiological studies and the use of radiofrequency ablation in the management of arrhythmias • Temporary or permanent pacemaker insertion
PRINCIPLES OF MANAGEMENT Advanced Trainees will understand the principles of management of congenital and acquired heart disease, including medical therapies, catheters, and surgical interventions.	• Counselling of acute management prior to presenting (e.g. SVT) • CPR training • Genetic counselling • Indications for temporary and permanent pacemakers, and implantable defibrillators and denervation procedures • Pharmacology of drugs used in the treatment of arrhythmias • Recommendations for external defibrillators
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management, and integrate these into care.	• How to provide appropriate counselling • Recommendations about exercise and lifestyle limitations • Risk factors/Recommendations for risk mitigation

KEY PRESENTATIONS AND CONDITIONS

Advanced Trainees will have a comprehensive depth of knowledge of these presentations and conditions.

Presentations

- Arrhythmia
- Chest pain
- Family history
- Fever
- Heart failure (breathlessness/ poor feeding/reduced exercise capacity)
- Palpitations
- Syncope

Conditions

- Inherited aortopathies:
  - » familial thoracic aortic aneurysm syndrome
  - » Loeys–Dietz syndrome
  - » Marfan syndrome
  - » vascular Ehlers–Danlos syndrome
- Inherited arrhythmias:
  - » arrhythmogenic right ventricular cardiomyopathy (ARVC)
  - » Brugada syndrome
  - » channelopathies
  - » CPVT
  - » long QT syndrome
- Inherited cardiomyopathies:
  - » dilated
  - » hypertrophic/sarcomeric (e.g. Fabry)
  - » left ventricular noncompaction cardiomyopathy (LVNC)
- Lipid disorders

LESS COMMON OR MORE COMPLEX PRESENTATIONS AND CONDITIONS

Advanced Trainees will understand these presentations and conditions.

Advanced Trainees will understand the resources that should be used to help manage patients with these presentations and conditions.

Presentations

As above

Conditions

- Heart disease associated with syndromes (e.g. Trisomy 21, Williams syndrome)
- Infiltrative cardiomyopathy (e.g. cardiac amyloidosis, hereditary transthyretin)

For each presentation and condition, Advanced Trainees will **know how to:**

Synthesise

» recognise the clinical presentation
» identify relevant epidemiology, prevalence, pathophysiology, and clinical science
» take a comprehensive clinical history
» conduct an appropriate examination
» establish a differential diagnosis
» plan and arrange appropriate investigations
» consider the impact of illness and disease on patients[20] and their quality of life when developing a management plan

Manage

» provide evidence-based management
» prescribe therapies tailored to patients' needs and conditions
» recognise potential complications of disease and its management, and initiate preventative strategies
» involve multidisciplinary teams

Consider other factors

» identify individual and social factors and the impact of these on diagnosis and management

[20] References to patients in the remainder of this document may include their families or carers.

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Fundamentals of human inheritance • Molecular pathophysiology of common inherited heart diseases • Principles of molecular genetics and genetic testing • Prognosis of genetic syndromes and their associated cardiac disorders
INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS Advanced Trainees will know the scientific foundation of each investigation and procedure, including relevant anatomy and physiology. They will be able to interpret the reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients, families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	**Investigations** • Antenatal genetic testing • Cascade testing • Genetic testing results, including interpretation and application • (e.g. amniocentesis, CGH array, WES testing) • MRIs, including the use of late gadolinium • Screening and monitoring of blood tests for lipid disorders/familial hypercholesterolemia • Screening processes for common inherited heart diseases, including ECGs of family members and/or echocardiograms as required **Procedures** • Adrenaline challenge • Appropriate referral for tissue/skin/muscle biopsies
PRINCIPLES OF MANAGEMENT Advanced Trainees will understand the principles of management of congenital and acquired heart disease, including medical therapies, catheters, and surgical interventions.	• Discuss risk of sudden cardiac death and risk of aortic dissection, including the use of risk calculators as appropriate • Indications for referral to genetic services for ongoing counselling and management • Initiate appropriate drug therapy in patients with lipid disorders and familial hypercholesterolemia • Recommendations for lifestyle and activity, including exercise • Refer as appropriate for surgery and/or insertion of implantable cardiac defibrillator
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.	• Importance of keeping abreast of advances in genetics • MDT approach, including interfaces with psychology/genetic counselling • Likelihood of recurrence in parents' subsequent children and offspring of the individual, including possibility of prenatal diagnoses