NEW CURRICULA

Advanced Training in Cardiology (Adult Medicine)

Curriculum standards

RACP Specialists. Together

About this document

The new Advanced Training in Cardiology (Adult Medicine) curriculum consists of curriculum standards and learning, teaching, and assessment (LTA) programs.

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

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Program overview

Purpose of Advanced Training

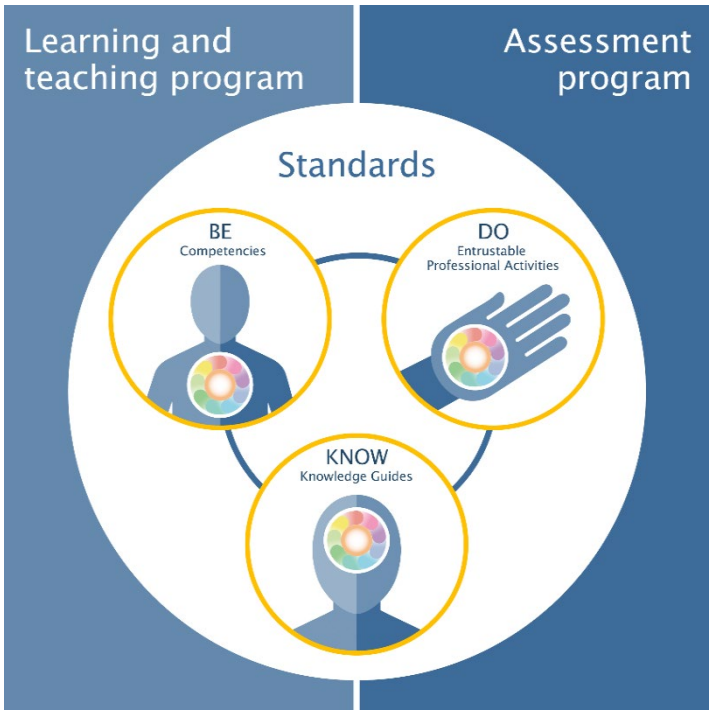
The RACP offers Advanced Training in 33 diverse medical specialties as part of Division, Chapter, or Faculty training programs.

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 trainees' 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 (LTA) structure

The learning, teaching and assessment 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 (Adult Medicine) specialty overview

A cardiologist has expertise in the prevention, detection, diagnosis and management of cardiovascular and circulatory diseases and disorders.

Cardiologists work to discover better ways of understanding, diagnosing, treating, and preventing the onset of cardiovascular disease, and ensure life-saving advances in research and technology are translated into clinical care.

Cardiology is a dynamic field of internal medicine. Cardiologists:

- **provide patient-centred clinical care across a variety of settings,** from delivering emergency treatment in acute care situations to improving and maintaining patients' quality of life following cardiac diagnoses and events, and managing the long-term care of patients with congenital and life-limiting cardiac conditions
- **perform procedures and investigations,** applying the latest evidence-based technologies to diagnose and treat cardiac conditions
- **have the opportunity to explore a range of subspecialty domains**, including:
  - » general cardiology
  - » interventional and structural cardiology
  - » valvular heart disease
  - » adult congenital heart disease
  - » inherited cardiac conditions
  - » advanced heart failure and cardiac transplantation
  - » cardiac imaging
  - » electrophysiology and device management.

Cardiovascular disease is a leading cause of death globally. As such, cardiologists play a key role in managing and educating patients and communities and advocating for disease prevention by:

- **working as an integral member of multidisciplinary teams.** 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
- **educating and advocating for patients and communities.** Cardiologists empower their patients to understand cardiovascular disease, risk, and prevention, and advocate for the equitable distribution of resources to address prevailing health inequities and help ensure optimal health outcomes for all patients
- **applying a scholarly approach.** Cardiologists conduct and apply academic research to make evidence-based decisions that improve the treatment and management of their patients.
- **being committed to teaching and learning.** Cardiologists are committed to maintaining lifelong excellence in practice through continuous professional development and fostering the learning of others through mentoring, supervising, and teaching.

Cardiology (Adult Medicine) learning goals

The curriculum standards are summarised as 19 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 in care 7. Acute care 8. Communication with patients 9. Procedures 10. Clinic management 11. Manage patients with untreatable life-limiting cardiac conditions
KNOW Knowledge guides	12. Scientific foundations of cardiology 13. Management of the acutely unwell (shocked) cardiac patient 14. Coronary artery disease 15. Conditions affecting the circulation 16. Structural heart disease, including valvular and congenital heart disease 17. Rhythm disorders 18. Heart failure 19. Interactions with other specialties and systems

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[1], families, or carers and in collaboration with the health care team.

[1] 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.[2]

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.[5] 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[3].

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 health care 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.*

[3] 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 in care	Manage the transition of patient care between health professionals, providers, and contexts
7	Acute care	Manage the early care of acutely unwell patients
8	Communication with patients	Discuss diagnoses and management plans with patients
9	Procedures	Plan, prepare for, perform, and provide aftercare for important practical procedures
10	Clinic management	Manage an outpatients clinic
11	Manage patients with untreatable life-limiting cardiac conditions	Manage the care of patients with untreatable life-limiting cardiac conditions

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	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• use evidence-based care to meet the needs of patients[4] 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 and 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 • place safety and quality of care first in all decision making	• 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

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

	• identify activities within systems to reduce errors, improve patient and population safety, and implement cost-effective change	• use information resources and electronic medical record technology where available
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 learners' progress, providing regular assessments and feedback	• accept feedback constructively, and change behaviour in response • recognise the limits of their 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 competent 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 discussion 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, achieving 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, transparent decision making • 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	• monitor services and provide appropriate advice • review new health care interventions and resources • 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 practices	• 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 • remove self-interest from solutions to health advocacy issues	• communicate with stakeholders within the organisation about health care delivery • understand methods used to allocate resources to provide high-quality care • promote the development and use of organisational policies and procedures

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 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 investigations 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[5] (e.g. younger or older people) and/or different populations	• observe learners to reduce risks and improve health outcomes

[5] 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 learned 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 supervision of professional development activities • encourage self-directed learning and assessment • develop a consistent and fair approach to assessing learners • tailor feedback and assessments 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 regarding 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 into 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 giving feedback to learners, and 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 performance 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 improvements • 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 • explain the value of health data in the care of patients or populations • support innovation in teaching and training	• may not integrate public health principals into teaching and practice

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 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	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• regularly review patients • evaluate practice to ensure it aligns with available evidence and guidelines • evaluate population, environmental, and lifestyle health risks, and advocate for healthy lifestyle choices • use standardised protocols to adhere to best practice and prevent the occurrence of wrong site/wrong patient procedures using mandatory informed consent • evaluate practice regularly to ensure it aligns with available evidence and guidelines	• contribute to processes on identified opportunities for improvement • recognise the importance of prevention and early detection in clinical practice • use local guidelines to assist patient care decision making
Communication	• use and support patients'[6] access to high-quality, easy-to-understand information about health care • support patients to share decision making about their own health care, to the extent they choose • assist patients to understand about hospital open disclosure policy • discuss with patients any safety and quality concerns they have relating to their care • implement the organisation's open disclosure policy	• explain that health literacy might affect the way patients or populations gain access to, understand, and use health information
Quality and safety	• demonstrate best practice, including infection control, adverse event reporting, and effective clinical handover	• demonstrate understanding of a system approach to improving the quality and safety of health care

[6] 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 meetings and clinical incident reviews, and apply decisions to practice • use clinical audits and registries of data on patients' experiences and outcomes, and learn from incidents and complaints, to improve patients' experiences and outcomes and mitigate against potential adverse outcomes	
Teaching and learning	• participate in professional training in quality and safety to ensure a contemporary approach to safety system strategies • supervise and manage junior colleagues' performance in the delivery of safe, high-quality care • ensure continuing professional development as per RACP and training requirements	• 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	• align improvement goals with the priorities of the organisation	• comply with professional regulatory requirements and codes of conduct
Judgement and decision making	• use decision-making support tools (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 patient risk of harm and promote multidisciplinary programs of education • contribute to developing an organisational culture that enables and prioritises patients' safety and quality	• 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 • contribute to relevant organisational policies and procedures • help to shape an organisational culture that prioritises safety and quality through openness, honesty, learning, and quality improvement

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 • take patient histories, including medication histories • obtain patients' existing medical records • examine patients • synthesise findings to develop provisional and differential diagnoses • discuss findings with patients[7], families and/or carers • generate a management plan, including choosing appropriate medicines • review medicines and interactions, and cease where appropriate • share information with other health professionals, including findings and/or changes to prescriptions	
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	• 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 • consider age, chronic disease status, lifestyle factors, allergies, potential drug interactions, and patient preference prior to prescribing new medications	• 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 • appropriately, safely, and accurately select medicines for common conditions

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

Communication	• communicate openly, listen, and take patients' concerns seriously, giving 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 • write clear and legible prescriptions in plain language, and include specific indications for the anticipated duration of therapy	• 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 emergencies • ensure that patients are informed of the material risks associated with any part of proposed management plans • review medicines regularly to reduce non-adherence, and monitor treatment effectiveness, possible side effects, drug interactions, and cease unnecessary medicines	• perform hand hygiene and take infection control precautions at appropriate moments • take precaution against assaults from confused or 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 involving patients in teaching activities • turn clinical activities into opportunities to teach, appropriate to the setting	• 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 that is 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 professional interpreters, health advocates, or family or community members 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 proxy decision makers appropriately • demonstrate understanding of the ethical implications of pharmaceutical industry marketing and funded research	• demonstrate professional conduct, honesty, and integrity • consider patients' decision-making capacities • 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 • follow organisational policies on pharmaceutical representative visits and drug marketing
Judgement and decision making	• apply knowledge and experience to identify patients' problems, make logical, rational decisions, and act to achieve positive outcomes for patients • 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 • select appropriate procedures and investigations • 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	• demonstrate clinical reasoning by gathering focused information relevant to patients' care • recognise personal limitations and seek help from experienced clinicians or pharmacists in an appropriate way when required
Leadership, management, and teamwork	• work effectively as a member of multidisciplinary teams to achieve patients' best health outcomes	• share relevant information with members of the health care team

	• demonstrate awareness of colleagues in difficulty, and work within the appropriate structural systems to support them while maintaining patient safety	
Health policy, systems, and advocacy	• participate in health promotion, disease prevention and control, screening, and reporting notifiable diseases • aim to achieve the optimal cost-effective patient care to allow maximum benefit from available resources • recognise the difference between Pharmaceutical Benefits Scheme (PBS), non-PBS, and authority prescribing	• identify and navigate components of the healthcare system relevant to patients' care • identify and access relevant community resources to support patient care

Learning goal 6: Management of transitions in care

Theme	Management of transitions in care	
Title	**Manage the transition of patient care between health professionals, providers, and contexts**	
Description	This activity requires the ability to: • manage a transition of patient care to ensure the optimal continuation of care between providers • identify the appropriate health care providers and other stakeholders with whom to share patient information • exchange pertinent, contextually appropriate, and relevant patient information • perform this activity in multiple settings appropriate to the speciality, including inpatient, ambulatory, and critical care settings	
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	• facilitate optimal transition of care for patients[8] • identify and manage key risks for patients during transitions • anticipate possible changes in patients' conditions, and provide recommendations on how to manage them	• understand the details of patients' conditions, illness severity, and potential emerging issues, with appropriate actions • provide accurate summaries of patients' information with accurate identification of problems or issues
Communication	• write relevant and detailed medical record entries, including clinical assessments and management plans • write comprehensive and accurate summaries of care, including discharge summaries, clinic letters, and transfer documentation • initiate and maintain verbal communication with other health professionals when required • communicate with patients, families or carers about transition of care, and engage and support these parties in decision making	• communicate clearly with clinicians and other caregivers • use standardised verbal and written templates to improve the reliability of information transfer and prevent errors and omissions • communicate accurately and in a timely manner to ensure an effective transition between settings, and continuity and quality of care
Quality and safety	• identify patients at risk of a poor transition of care, and mitigate this risk • use electronic tools (where available) to securely store and transfer patient information	• ensure that handovers are complete, or work to mitigate risks if a handover was incomplete • ensure all outstanding results or procedures are followed up by receiving units and clinicians

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

	• use consent processes, including written consent if required, for the release and exchange of information • demonstrate an understanding of the medicolegal context of written communications	• keep patients' information secure, and adhere to relevant legislation regarding personal information and privacy
Teaching and learning	• integrate clinical education in handover sessions and other transition of care meetings • tailor clinical education to the level of the professional parties involved	• take opportunities to teach junior colleagues during handovers as necessary
Cultural safety	• communicate about patients' preferences with careful consideration to health literacy, language barriers, and culture, whether the preferences are realistic and possible, and respect patients' choices • recognise the timing, location, privacy, and appropriateness of information sharing with patients and their families or carers	• include relevant information regarding patients' cultural or ethnic backgrounds, and whether an interpreter is required, in handovers
Ethics and professional behaviour	• disclose and share only contextually appropriate medical and personal information • demonstrate understanding of the clinical, ethical, and legal rationale for information disclosure • share information about patients' health care in a manner consistent with privacy laws and professional guidelines on confidentiality • demonstrate understanding of the additional complexity related to some types of information (e.g. genetic information or blood-borne virus status), and seek appropriate advice about disclosure of such information • interact in a collegiate and collaborative way with professional colleagues during transitions of care	• maintain respect for patients, families, carers, and other health professionals, including respecting privacy and confidentiality
Judgement and decision making	• ensure patients' care is in the most appropriate facility, setting, or provider	• use a structured approach to considering and prioritising patients' issues • recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• share the workload of transitions of care appropriately, including delegation • demonstrate understanding of the medical governance of patient care and the differing roles of team members	• recognise factors that impact on the transfer of care, and help subsequent health professionals understand the issues to continue care

	• show respect for the roles and expertise of other health professionals, and work effectively as a member of professional teams • ensure that multidisciplinary teams provide opportunities for patients' engagement and participation when appropriate	• work to overcome the potential barriers to continuity of care, and appreciate the role of handover in overcoming these barriers
Health policy, systems, and advocacy	• contribute to processes for managing risks and identifying strategies for the improvement of transitions of care • engage in organisational processes to improve transitions of care, such as formal surveys or follow-up phone calls after hospital discharges	• factor transport issues and costs to patients into arrangements for transferring patients to other settings

Learning goal 7: Acute care

Theme	Acute care	
Title	**Manage the early care of acutely unwell patients**	
Description	This activity requires the ability to: • assess seriously unwell or injured patients[9], and initiate management • recognise clinical deterioration, and respond by following the local process for escalation of care • recognise and manage patients with acute cardiac conditions, including those who require resuscitation • lead the resuscitation team initially, and involve other necessary services • liaise with transport services and medical teams • perform this activity in inpatient settings, including emergency departments, intensive care units, and wards	
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 immediate life-threatening conditions, deteriorating and critically unwell patients, and respond appropriately • perform necessary emergency cardiac interventions to a high level • demonstrate knowledge of potential risks and complications of emergency interventions • effectively assess, diagnose, and manage acute undifferentiated clinical presentations • select investigations that ensure maximum patient safety through excluding or diagnosing critical patient issues • systematically identify causes of acute deterioration in health status and levels of physical and cognitive functioning • proactively manage escalations or transitions of care in a timely fashion • develop plans of multidisciplinary treatment, rehabilitation, and secondary prevention following acute events	• recognise seriously unwell patients requiring immediate care • apply basic life support as indicated • understand general medical principles to caring for patients with undifferentiated and undiagnosed conditions • identify potential causes of current deterioration, and comply with escalation protocols • facilitate initial tests to assist in diagnosis and develop management plans for immediate treatment • document information to outline the rationale for clinical decisions and action plans • assess perioperative and periprocedural patients

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

	• provide clear and effective discharge summaries with recommendations for ongoing care • optimise medical management before, during, and after operations	
Communication	• communicate clearly with other team members, and coordinate efforts of multidisciplinary team members • use closed-loop, clear communication with other health care team members during emergency interventions • facilitate early communication with patients, families, carers, and health care team members to allow for shared decision making • negotiate realistic treatment goals, and determine and explain the expected prognoses and outcomes • determine the level of health literacy of individual patients, and the level of understanding of agreed care decisions • communicate with patients, families or carers in a sensitive and supportive manner, avoiding jargon and confirm their understanding	• demonstrate communication skills to sufficiently support the function of multidisciplinary teams • if possible, determine patients' understandings of their diseases and what they perceive as the most desirable goals of care
Quality and safety	• maintain up-to-date certification in advanced life support • use clinical information technology systems for conducting retrospective and prospective clinical audits • evaluate and explain the benefits and risks of clinical interventions based on individual patients' circumstances • analyse adverse incidents and sentinel events to identify system failures and contributing factors • identify evidence-based practice gaps using clinical indicators, and implement changes to improve patients' outcomes • coordinate and encourage innovation, and objectively evaluate improvement initiatives for outcomes and sustainability	• evaluate the quality of processes through well-designed audits • recognise the risks and benefits of operative interventions • raise appropriate issues for review at morbidity and mortality meetings • evaluate the quality and safety processes implemented within the workplace, and identify gaps in their structure
Teaching and learning	• demonstrate effective supervision skills and teaching methods which are adapted to the context of the training	• mentor and train others to enhance team effectiveness • provide constructive feedback to junior colleagues to contribute to improvements in individuals' skills

	• encourage questioning among junior colleagues and students in response to unanswered clinical questions • seek guidance and feedback from health care teams to reflect on the encounter and improve future patients' care	• coordinate and supervise junior colleagues from the emergency department and wards
Research	• select studies based on optimal trial design, freedom from bias, and precision of measurement • evaluate the value of treatments in terms of relative and absolute benefits, cost, potential patient harm, and feasibility • evaluate the applicability of results of clinical studies to the circumstances of individual patients, especially those with multiple comorbidities • specify research evidence to the needs of individual patients	• demonstrate efficient searching of literature databases to retrieve evidence • use information from credible sources to aid in decision making • refer to evidence-based clinical guidelines and protocols on acutely unwell patients • demonstrate an understanding of the limitations of the evidence and the challenges of applying research in daily practice
Cultural safety	• negotiate health care decisions in a culturally appropriate way by considering variation in family structures, cultures, religion, or belief systems • integrate culturally appropriate care of Aboriginal and Torres Strait Islander and Māori peoples into patients' management • consider cultural, ethical, and religious values and beliefs in leading multidisciplinary teams	• practise cultural competency appropriate for the community serviced • proactively identify barriers to access to health care
Ethics and professional behaviour	• develop management plans based on medical assessments of the clinical conditions and multidisciplinary assessments of functional capacity • advise patients of their rights to refuse medical therapy, including life-sustaining treatment • consider the consequences of delivering treatment that is deemed futile, and direct to other care as appropriate • facilitate interactions within multidisciplinary teams, respecting values, encouraging involvement, and engaging all participants in decision making • demonstrate critical reflection on personal beliefs and attitudes, including how these may affect patients' care and health care policies	• communicate medical management plans as part of multidisciplinary plans • establish, where possible, patients' wishes and preferences about care

Judgement and decision making	• recognise the need for escalation of care and escalate to appropriate staff or services • integrate evidence related to questions of diagnosis, therapy, prognosis, risks, and causes into clinical decision making • reconcile conflicting advice from other specialties, and apply judgement in making clinical decisions in the presence of uncertainty • use care pathways effectively, including identifying reasons for variations in care	• involve additional staff to assist in a timely fashion when required • recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• work collaboratively with staff in emergency departments, intensive care units, and other subspecialty inpatient units • manage the transition of acute medical patients through their hospital journeys • lead a team by providing engagement while maintaining a focus on outcomes	• collaborate with and use other team members, based on their roles and skills • ensure appropriate multidisciplinary assessments and management • encourage an environment of openness and respect to lead effective teams • contribute to building a productive culture within teams
Health policy, systems, and advocacy	• use a considered and rational approach to using resources responsibly, and balance costs against outcomes • prioritise patient care based on needs, and consider available health care resources • collaborate with emergency medicine staff and other colleagues to develop policies and protocols for the investigation and management of acute cardiac conditions	• understand the systems for the escalation of care for deteriorating patients • understand the role of clinician leadership and advocacy in appraising and redesigning systems of care that lead to better patient outcomes

Learning goal 8: 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, and include family, 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'[10], family members' or carers' understanding of the 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, including assessments and investigations, and give them 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	• apply knowledge of the scientific basis of health and disease to the management of patients • demonstrate an understanding of the clinical problems being discussed • formulate management plans in partnership with patients
Communication	• use an appropriate communication strategy and modalities for communication, such as email, face-to-face, or phone calls • elicit patients' views, concerns, and preferences, promoting rapport • encourage questions, and answer them thoroughly	• select appropriate modes of communication • engage patients in discussions, avoiding the use of jargon • check patients' understanding of information • collaborate with patient liaison officers as required

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

	• provide information to patients in plain language, avoiding use of jargon, acronyms, and complex medical terms • encourage questions and answer them thoroughly • ask patients to share their thoughts or to explain their management plan in their own words, to verify understanding • convey information considerately and sensitively to patients, and seek clarification if unsure of how best to proceed	• adapt communication style in response to patients' cognitive, physical, cultural, socioeconomic, and situational factors
Quality and safety	• discuss with patients their condition and the available management options, including their potential risk to benefit ratios • provide information to patients in a way they can understand before asking for their consent • consider patients' capacity for decision making and consent • recognise and take precautions where patients may be vulnerable, such as issues of self-harm or elder abuse • participate in processes to manage patient complaints	• inform patients of the material risks associated with the proposed management plan • treat information about patients as confidential
Teaching and learning	• discuss the aetiology of diseases and explain the purpose, nature, and extent of assessments 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 conditions
Research	• provide information to patients that is based on guidelines issued by the National Health and Medical Research Council and/or Health Research Council of NZ • provide information to patients in a way they can understand before asking for their consent to participate in research • obtain informed consent or other valid authority before involving patients 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
Cultural safety	• effectively communicate with members of cultural groups, such as Aboriginal and Torres Strait Islander and Māori peoples, 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	• identify when to use interpreters • allow enough time for communication across linguistic and cultural barriers

	• provide plain-language and culturally appropriate written materials to patients when possible	
Ethics and professional behaviour	• encourage and support patients to be well informed about their health and to use this information wisely when they are making 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 • 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 health care team members involved in patients' care, and with patients and 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 health care team members to align them with the appropriate resources • facilitate an environment where all team members feel they can contribute and their opinion is valued • communicate accurately and succinctly, and motivate others on the health care team	• answer questions from team members • summarise, clarify, and communicate responsibilities of health care team members • keep health care team members focused on patient outcomes
Health policy, systems, and advocacy	• collaborate with other services, such as community health centres and consumer organisations, to help patients navigate the healthcare system	• communicate with and involve other health professionals as appropriate

Learning goal 9: Procedures

Theme	Procedures	
Title	**Plan, prepare for, perform, and provide aftercare for important practical procedures and investigations**	
Description	This activity requires the ability to: • evaluate the anticipated value of the procedure or investigation • select appropriate procedures or investigations in partnership with patients[11] and their family members or carers • communicate potential risks and benefits prior to obtaining informed consent • set up the equipment, maintaining an aseptic field • perform procedures and investigations where appropriate • manage unexpected events and complications during and after procedures and investigations • provide aftercare for patients • communicate aftercare protocols and instructions to patients and medical and nursing staff • interpret the results and outcomes of procedures and investigations, including imaging and reports • communicate the outcome of procedures and associated investigations to patients • perform this activity across multiple relevant settings	
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	• select procedures and investigations by assessing patient-specific factors, risks, benefits, and alternatives • confidently and consistently perform a range of common procedures and investigations • ensure that team members are aware of all allergies/adverse reactions identified, and take precautions to avoid allergies/adverse reactions during procedures or investigations • ensure patients have complied with pre-procedure preparation • confirm the correct position/site/side/level on the patient for the planned procedure • recognise and manage effectively complications arising during or after procedures or investigations	• assess patients and identify indications for procedures or investigations • check for allergies and adverse reactions • consider risks and complications of procedures or investigations • interpret results of common diagnostic procedures or investigations • perform a range of common procedures and investigations • understand the significance of abnormal test results, and act on them • organise and document post-procedure or investigation reviews of patients

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

	• recognise and correctly interpret normal and abnormal findings of diagnostic procedures or investigations	
Communication	• explain procedures and investigations clearly to patients, family or carers, including reasons for procedures or investigations, possible risks, benefits, burdens, costs, side effects, and potential alternatives, including the option to have no investigations or procedures • counsel patients sensitively and effectively, and support them to make informed choices • address patients' and family or carers' concerns relating to procedures or investigations, providing opportunities to ask questions • tailor language according to patients' age and capacity to understand • communicate effectively with team members, patients, family and carers prior to, during, and after procedures or investigations • accurately document procedures and investigations in the clinical notes, including informed consent, procedures or investigations requested and performed, reasons for procedures or investigations, medicines given, aseptic technique, and aftercare	• explain the process of procedures or investigations to patients without providing a broader context • help patients, family or carers to choose procedures or investigations • communicate with members of procedural teams so all team members understand who each member is • discuss post-procedural care with patients, family or carers • complete relevant patients' documentation and conduct an appropriate clinical handover
Quality and safety	• identify adverse outcomes that may result from proposed investigations and procedures, focusing on patients' individual situations • obtain informed consent or other valid authority before undertaking any procedure or investigation • set up all necessary equipment, and consistently use universal precautions and aseptic technique • confirm patients' identification, verify the procedure or investigation, and, where appropriate, the correct site/side/level for the procedure or investigation • ensure that information on patients' consent forms matches procedures or investigations to be performed	• provide information in a manner so patients, family or carers are fully informed when consenting to any procedure or investigation • 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 or investigation in an unsafe environment • seek help with interpretation of test results for less common tests or indications or unexpected results

	• identify, document, and appropriately notify of any adverse event or equipment malfunction	
Teaching and learning	• refer to and/or be familiar with relevant published guidelines prior to undertaking procedures or investigations • 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 to maintain currency with investigation guidelines • help junior colleagues develop new skills • actively seek feedback on personal technique until competent
Research	• provide patients with relevant information if a proposed investigation or procedure is part of a research program • obtain written consent from patients if the investigation or procedure is part of a research program	• refer to evidence-based clinical guidelines • consult current research on investigations and procedures
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	• confidently perform common procedures or investigations • identify appropriate proxy decision makers when required • show respect for knowledge and expertise of colleagues • maximise patient autonomy in decision making • respect patients' decisions to refuse investigations or procedures, even if their decisions may not be appropriate or evidence based • demonstrate awareness of complex issues related to genetic information obtained from investigations or procedures, and subsequent disclosure of such information	• perform procedures or investigations when adequately supervised • follow procedures to ensure safe practice
Judgement and decision making	• identify role and optimal timing for diagnostic procedures and investigations • evaluate the costs, benefits, and potential risks of each investigation or procedure in a clinical situation • adapt procedures or investigations in response to assessments of risks to individual patients • make clinical judgements and decisions based on the available evidence	• prioritise which patients receive procedures or investigations first (if there is a waiting list) • recognise personal limitations and seek help (e.g. from heart team) in an appropriate way when required • use tools and guidelines to support decision making • recommend suboptimal procedures or investigations for patients

Leadership, management and teamwork	• explain critical steps, anticipated events, and equipment requirements to teams on planned procedures or investigations • 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 team members are confident and competent in their assigned roles	• demonstrate understanding of what parts of an investigation are provided by different doctors or health professionals • 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 and investigations in accordance with the organisational guidelines and policies

Procedure/ investigation	For each procedure/investigation, trainees should be able to perform the components of the procedure indicated below									
	Evaluate the anticipated value of the procedure /investigation	Communicate potential risks and benefits prior to obtaining informed consent	Set up the equipment, maintaining an aseptic field	Perform procedures/ investigations where appropriate	Manage unexpected events and complications during and after procedures/ investigations	Provide after-care for patients	Communicate after-care protocols and instructions to patients and medical and nursing staff	Interpret the results/ outcomes of procedures/ investigations, including imaging and reports	Communicate the outcome of the procedure and associated investigations to patients	Perform this activity across multiple relevant settings
Coronary angiograms	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
Right heart catheterisation and haemodynamic studies	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
Pericardial effusion management	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
Temporary mechanical support device implantation	✓	✓	✓	n/a	✓	✓ for balloon pump/impella procedures	✓	✓	✓	n/a
Temporary transvenous pacemaker insertion	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
Device testing in pacemaker clinic	✓	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a
Holter monitor	✓	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a
Exercise electrocardiogram	✓	✓	n/a	✓	n/a	✓	✓	✓	✓	n/a
Direct current cardioversion	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
Transthoracic echocardiogram	✓	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a
Transoesophageal echocardiogram	✓	✓	✓	n/a	✓	✓	✓	✓	✓	n/a
Stress echocardiogram	✓	✓	n/a	n/a	✓	✓	✓	✓	✓	n/a
Report echo under supervision	✓	n/a	n/a	✓	n/a	✓	✓	✓	✓	n/a

Procedure/ investigation	For each procedure/investigation, trainees should be able to perform the components of the procedure indicated below									
	Evaluate the anticipated value of the procedure /investigation	Communicate potential risks and benefits prior to obtaining informed consent	Set up the equipment, maintaining an aseptic field	Perform procedures/ investigations where appropriate	Manage unexpected events and complications during and after procedures/ investigations	Provide after-care for patients	Communicate after-care protocols and instructions to patients and medical and nursing staff	Interpret the results/ outcomes of procedures/ investigations, including imaging and reports	Communicate the outcome of the procedure and associated investigations to patients	Perform this activity across multiple relevant settings
Electrophysiology study	✓	✓	✓	n/a	✓	✓	✓	✓	✓	n/a
Catheter ablation	✓	✓	✓	n/a	✓	✓	✓	✓	✓	n/a
Cardiac resynchronisation therapy: pre/post mgmt + implant	✓	✓	✓	n/a	✓	✓	✓	✓	✓	n/a
Implantable cardioverter defibrillator: referral or implant + post mgmt	✓	✓	✓	n/a	✓	✓	✓	✓	✓	n/a
Coronary artery bypass grafting	✓	✓	✓	n/a	✓	✓	✓	✓	n/a	n/a
Valve surgery	✓	✓	✓	n/a	✓	✓	✓	✓	n/a	n/a
Transcatheter aortic valve implantation	✓	✓	✓	n/a	✓	✓	✓	✓	n/a	n/a
Cardiac MRI studies	✓	✓	n/a	n/a	✓	✓	✓	✓	✓	n/a
Cardiac CT studies	✓	✓	n/a	n/a	✓	✓	✓	✓	✓	n/a
CT Coronary Angiography	✓	✓			✓	✓	✓	✓	✓	n/a
CT Transcatheter Aortic Valve Implantation	✓	✓			✓	✓	✓	✓	✓	n/a

Learning goal 10: Clinic management

Theme	Clinic management	
Title	**Manage an outpatients clinic**	
Description	This activity requires the ability to: • communicate with patients[12] • manage clinic services • oversee quality improvement activities • liaise with other health professionals and team members • demonstrate problem-solving skills • engage with the broader health policy context and empower primary health care providers to be involved in cardiac care • liaise with health authorities when appropriate	
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	• effectively identify and address current clinical concerns as well as longer-term clinical objectives, as appropriate to patient context • evaluate environmental and lifestyle health risks, and advocate for healthy lifestyle choices • create accurate and appropriately prioritised problem lists in the clinical notes or as part of ambulatory care reviews • maintain up-to-date documentation on patients' presentation, management, and progress, including key points of diagnosis and decision making to inform coordination of care	• demonstrate understanding of the importance of prevention, early detection, health maintenance, and chronic condition management
Communication	• help patients navigate the healthcare system to improve access to care by collaborating with other services, such as community health centres and consumer organisations • use telehealth and digitally integrated support services to enable patients' access to care	• wherever practical, meet patients' specific language and communication needs, such as the appropriate use of interpreter services and translated materials • work in partnership with patients and motivate them to comply with agreed care plans

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

Quality and safety	• practice health care that maximises patient safety • adopt a systematic approach to the review and improvement of professional practice in the outpatients clinic setting • identify aspects of service provision that may be a risk to patients' safety • contribute to the development of clinical pathways for chronic diseases management based on current clinical guidelines • ensure that patients are informed about fees and charges	• take reasonable steps to address issues if patients' safety may be compromised • understand a systematic approach to improving the quality and safety of health care • participate in organisational quality and safety activities, including clinical incident reviews • use clinical practice guidelines for chronic diseases management
Teaching and learning	• evaluate own professional practice • demonstrate effective learning behaviours and self-evaluation • educate junior colleagues • maintain professional continuing education standards relevant to the profession	• refer to evidence-based clinical guidelines • consult current research on procedures and investigations
Research	• obtain informed consent or other valid authority before involving patients in research • search for and critically appraise evidence to resolve clinical areas of uncertainty	• make therapeutic decisions according to the best evidence • recognise where evidence is limited, compromised, or subject to bias or conflict of interest
Cultural safety	• apply knowledge of the cultural needs of the community, and adapt practice to improve patient engagement and health care outcomes • provide culturally safe chronic disease management • mitigate the influence of own culture, beliefs, and biases on decision making and interactions with patients	• consider the social, economic, cultural, and behavioural factors influencing health, both at individual and population levels
Ethics and professional behaviour	• identify and respect boundaries that define professional and therapeutic relationships • respect the roles and expertise of other health professionals • manage own time and workload (i.e. be punctual, communicate with patients in a timely way, and ensure schedule is feasible) • comply with the legal requirements of preparing and managing documentation • demonstrate awareness of financial and other conflicts of interest • comply with consent processes, privacy law, and professional guidelines about confidentiality when sharing patient information	• 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 the use of social media is consistent with ethical and legal obligations

Judgement and decision making	• integrate prevention, early detection, health maintenance, and chronic condition management into clinical practice where relevant • work to achieve optimal and cost-effective patient care that allows maximum benefit from the available resources	• understand the appropriate use of human resources, diagnostic interventions, therapeutic modalities, and health care facilities
Leadership, management, and teamwork	• prepare for and conduct clinical encounters in a well-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	• attend relevant clinical meetings regularly
Health policy, systems, and advocacy	• 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, community, and national health needs • help patients access initiatives and services for people with chronic diseases and disabilities	• identify common population health screening and prevention approaches • demonstrate awareness of government initiatives and services available for patients with chronic diseases and disabilities, and knowledge of how to access them

Learning goal 11: Manage patients with untreatable life-limiting cardiac conditions

Theme	**Life-limiting cardiac conditions**	**Cardio-EPA-10**
Title	**Manage the care of patients with untreatable life-limiting cardiac conditions**	
Description	This activity requires the ability to: • assess and manage patients with chronic and acute life-limiting cardiac conditions • support patients[13] to plan for their advance care and document their own wishes • provide care that aligns with patients' goals and values • monitor and adjust treatments to manage patients' symptoms and improve and/or maintain their comfort and quality of life • recognise when curative treatments have been exhausted, and review and rationalise medications to reduce polypharmacy (if appropriate) • initiate palliative care processes • collaborate with other healthcare providers	
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	• assess patients' physical and psychological symptoms • identify impacts on patients' independence and functioning • provide appropriate and individualised holistic symptom management that aligns with patients' wishes • recognise and assess functional decline (e.g. resulting from CHF or AMI) • prescribe and review medications to manage symptoms and improve quality of life • modify treatments in response to impacts of comorbidities • assess patients' adherence to treatment recommendations • review the goals of care and treatment plans with patients, their family or carers if significant changes in patients' condition or circumstances occur • manage comorbidities in consultation with other health professionals involved in patients' care	• provide timely assessment and document patients' care plans • manage physical symptoms in alignment with patients' wishes • take steps to alleviate patients' symptoms and distress

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

	• avoid unnecessary investigations or treatment • recognise and manage the terminal phase in a timely way • advise on device management for patients in the dying phase, including deactivation of implanted mechanical supports	
Communication	• establish supportive relationships with patients, their families or carers based on understanding, trust, empathy, and confidentiality • facilitate discussions with patients, families and carers regarding goals of care • communicate estimated prognoses appropriately, if requested, including the uncertainties around such estimates • support patients, families and carers to make informed decisions about withdrawing and/or withholding treatment • recognise carer stress and identify and refer to appropriate resources	• discuss with patients, family or carers the goals of care and treatment, and document this in patients' clinical records • ensure consistent messages are given to patients, families or carers about treatment options, their likelihood of success, risks, and prognoses • provide an honest and clear clinical assessment summary of the situation using plain language, avoiding medical jargon
Quality and safety	• review and rationalise medications • participate in multidisciplinary mortality and morbidity reviews, and provide feedback to colleagues • seek feedback about the quality of care from multidisciplinary team members, patients, and families or carers	• communicate the content of discussions about prognoses and advance care planning to multidisciplinary teams • ensure that actual care is aligned with patients' documented wishes
Teaching and learning	• provide supervision, support and teaching to develop the skills of junior colleagues • reflect on personal practice to guide continuing professional development	• participate in education on disease-specific symptom assessment and evidence-based symptom management • encourage junior colleagues to participate in multidisciplinary case reviews, mortality and morbidity reviews, and adverse event reviews
Research	• use systematic reviews or personal reviews and appraisal of available literature as evidence for appropriate management • support clinical trials to build the end-of-life care evidence base	• recognise that the evidence may be insufficient to resolve uncertainty and make definitive decisions
Cultural safety	• practise culturally responsible medicine based on understanding the personal, historical, and cultural influences on patients, families or carers • support patients, families or carers to include cultural or religious practices in their care	• respond to and respect individual preferences and needs of patients, regardless of culture and religious beliefs • support patients and families or carers with communication difficulties associated with cultural and linguistic diversity

Ethics and professional behaviour	• enhance quality of life for patients in the dying phase by avoiding unnecessary investigations or treatments • recognise the complexity of ethical issues related to human life and death • maintain professional boundaries in managing end of life	• ensure that information on advance care plans, treatment plans, goals of care and patients' treatment preferences is available to all involved in patients' care
Judgement and decision making	• maximise patients' autonomy and their best interests when negotiating treatment decisions • recognise appropriate timing for deactivation of implanted devices • liaise with other relevant services (e.g. palliative care services) and provide referral as necessary	• define and document patients' and family or carers' goals and agreed outcomes
Leadership, management, and teamwork	• define the roles and responsibilities of team members involved in patients' care • ensure care plans are communicated to all teams involved in patients' care to avoid ambiguity in treatment goals and futile and/or unwanted treatments • achieve agreement between multidisciplinary teams about patients' treatment options • coordinate care and support to be provided in patients' preferred place of care	• document multidisciplinary care plans
Health policy, systems, and advocacy	• participate in developing frameworks for organisational advance care planning • advocate for the needs of individual patients, social groups, and cultures within the community who have specific palliative care needs or inequitable access to palliative care services • apply local institutional policies relevant to the process of withdrawal of advanced life-sustaining therapies	• allocate scarce health care resources effectively

Knowledge guides



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

KGs will vary from program to program. The KGs listed below have been developed for the Advanced Training in Cardiology (Adult Medicine) program.

#	Title
12	Scientific foundations of cardiology
13	Management of the acutely unwell (shocked) cardiac patient
14	Coronary artery disease
15	Conditions affecting the circulation
16	Structural heart disease, including valvular and congenital heart disease
17	Rhythm disorders
18	Heart failure
19	Interactions with other specialties and systems

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.

Clinical sciences

- Anatomy of the cardiovascular system:
  - » blood vessels and circulation
    - arterial and venous structure and innervation
    - peripheral vasculature
    - pulmonary vascular system
    - the great vessels
  - » common congenital abnormalities
    - atrial and ventricular septal defects
    - aortopathies
    - bicuspid aortic valve
    - conduction abnormalities (accessory pathways)
    - patent ductus arteriosus
    - patent foramen ovale
    - Tetralogy of Fallot
    - transposition of the great arteries
  - » the heart
    - cardiac chambers
    - cardiac innervation
    - cardiac valves
    - conduction pathways
    - coronary arterial system and variants
    - coronary venous system
    - pericardium
- Pathophysiology of cardiovascular disease:
  - » atherosclerosis & cardiac ischaemia
  - » cardiac valve dysfunction – aortic, mitral, tricuspid, pulmonary
  - » conduction diseases – atrial fibrillation/flutter, re-entrant tachycardias, ventricular tachycardia, ventricular fibrillation, heart block
  - » dyslipidaemias
  - » heart failure
  - » infective endocarditis
  - » pericardial diseases – tamponade, constrictive pericarditis, restrictive pericarditis
- Physiology of the cardiovascular system:
  - » arterial blood pressure regulation
    - renin–angiotensin–aldosterone system
    - vascular compliance and vasoactive compounds
    - sympathetic and parasympathetic regulation
  - » cardiac contractility
    - Frank–Starling mechanism
    - haemodynamic curves
    - myocardial cell biology
    - preload and afterload
    - regulatory systems (renal, nervous)
  - » congenital
    - shunt calculations
    - Eisenmenger's physiology
  - » coronary arterial blood flow and regulation
  - » electrophysiology
    - cellular electrophysiology
    - nervous regulation of heart rate
    - the surface ECG
  - » hypertension in pregnancy

- lipid metabolism
- microcirculation and interstitial oedema

- Principles of pharmacology:
  - drug distribution
  - drug excretion
  - drug metabolism
  - mechanisms of major drug classes in cardiology:
    - alpha and beta blockers
    - anti-arrhythmic drug classes
    - anticoagulants
    - antiplatelet agents
    - calcium channel blockers
    - diuretics
    - lipid modifying agents
    - nitrates
    - other heart failure therapies (neprilysin inhibitors, SGLT2 inhibitors, GLP1 agonists, perhexiline)
    - renin–angiotensin system inhibitors
    - thrombolytic therapy
  - medications with cardiac complications:
    - cardiotoxic medications
    - QTc prolonging drugs
  - PBS prescribing and alternatives
  - pharmacodynamics
  - pharmacokinetics

Principles of statistics and epidemiology

- Basic statistics:
  - absolute and relative risk ratios
  - likelihood ratios and odds ratios
  - null hypothesis and P-values, confidence intervals
  - sensitivity, specificity, and predictive values
  - statistical tests – chi-square, t-tests, ANOVA, regression analysis
  - type I and II errors, power calculations
- Clinical research studies:
  - ethical principles
  - study types
    - case reports
    - observational studies
    - randomised control trials
    - registry analyses
    - systematic reviews and meta analysis
- Levels of evidence and classes of recommendations
- Population risk determination of cardiovascular disease:
  - biomarker development
  - community/policy prevention measures
  - risk scoring systems

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

Non-invasive investigations

- Ambulatory blood pressure monitoring
- Ankle-brachial index
- Arterial and venous doppler studies
- Basic cardiac laboratory investigations (BNP/NT-proBNP, CK-MB, fasting lipid profiles, high sensitivity CRP, troponin)
- Cardiac MRI (CMR)
- CT coronary angiography (CTCA) and coronary artery calcium score (CACS)
- Echocardiography and stress echocardiography
- Electrocardiography
- Exercise stress testing

reported results of each investigation or procedure. Advanced Trainees will know how to explain the investigation or procedure to patients[14], families, and carers, and be able to explain procedural risks and obtain informed consent where applicable.	• Holter monitoring • Myocardial perfusion scans • Positron emission studies **Procedures and invasive investigations** • Alcohol septal ablation • Cardiac biopsy • Cardiac resynchronisation therapy • Cardiac transplantation • Coronary angiography and percutaneous coronary intervention • Defibrillator implantation • Direct current cardioversion • Electrophysiology studies and ablation • Mechanical circulatory support (e.g. extracorporeal membrane oxygenation, intra-aortic balloon pump insertion, left ventricular assist devices) • Pacemaker implantation • Pericardiocentesis • Right heart catheterisation • Temporary pacing wire insertion • Trans-catheter valve interventions • Transoesophageal echocardiography

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

Learning goal 13 – Management of the acutely unwell (shocked) cardiac patient

Advanced Training in Cardiology (Adult Medicine)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Cardiac arrest
- Chest pain
- Dyspnoea
- Hypotension
- Lightheadedness/Presyncope
- Oliguria
- Syncope

Conditions

- Acute myocardial infarction (AMI) complicated by cardiogenic shock
- Acute decompensated heart failure
- Cardiac arrest
- Cardiac tamponade
- Haemodynamically unstable arrhythmias:
  - » bradyarrhythmias
  - » tachyarrhythmias
- Severe myocarditis

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

- Aortic dissection
- Complications of late-presenting acute myocardial infarctions (e.g. mechanical complications, ventricular septal rupture papillary muscle rupture with severe MR cardiomyopathy)
- Complications of valvular disease severe aortic stenosis
- Respiratory failure
- Septic shock
- Thromboembolism (e.g. saddle embolus, large/multiple emboli with right heart sequelae)

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[15] 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

[15] 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.

Clinical sciences

- Cardiac arrest
- Understand and describe cardiac and non-cardiac causes of cardiac arrest, and principles of cardiopulmonary resuscitation
- Understand and describe current Australian Resuscitation Council (ARC) guidelines on cardiopulmonary resuscitation and management of an acutely unwell patient
- Understand and describe role of non-invasive and invasive ventilation respiratory failure and acute heart failure

Key medications

- Indications for and limitations of anti-arrhythmic agents (for tachyarrhythmias)
- Indications for and limitations of chronotropic agents (for bradyarrhythmias)
- Indications for and limitations of inotropes and vasopressors
- Indications for thrombolysis (for ST elevation myocardial infarctions, and haemodynamically unstable pulmonary emboli)
- Pharmacology of drugs currently used in the treatment of heart failure, including inotropes and vasopressors

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

- Blood tests, including blood gas analysis
- Cardiac magnetic resonance imaging
- Consider the role of CT aortography in specific emergent conditions (e.g. surgical work-up for aortic dissection, to diagnose pulmonary embolus)
- Echocardiography (transthoracic and transoesophageal)
- Electrocardiography
- Invasive cardiac catheterisation, including left and right heart catheterisation

Procedures

- Coronary angiography and/or percutaneous intervention
- Direct current cardioversion (DCR)
- Mechanical circulatory supports (e.g. extra-corporeal membrane oxygenation, intra-aortic balloon pumps, left ventricular assist devices)
- Pacemakers/Temporary pacing wires (indications for)
- Percutaneous structural interventions (e.g. balloon aortic valvuloplasty and/or transcatheter aortic valve implantation)
- Pericardiocentesis
- Referral for surgical interventions, including valve surgery, cardiac transplantation, and assist devices
- Right heart catheterisation
- Transthoracic and transoesophageal echocardiograms

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.

General management considerations

- Goals of therapy
- Impact of comorbidities on diagnosis and management
- Individual patient clinical indications to determine patients' needs, and the most appropriate approach to investigations and care
- Patient demographics, including geographical location, socioeconomic status, ethnicity, and cultural background, and the considerations when managing and following up these patients (e.g. travel from rural to metropolitan areas)
- The timing of decisions and risks for the individual patient

Specific management considerations

- Rehabilitation/Referral to rehab likely useful – especially if prolonged hospitalisation/ICU admission

Learning goal 14 – Coronary artery disease

Advanced Training in Cardiology (Adult Medicine)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Arrhythmia
- Diaphoresis
- Effort intolerance
- Nausea
- Shortness of breath
- Syncope
- Typical angina pain (i.e. chest, jaw, back, arm)

Conditions

- Acute coronary syndromes:
  - non-ST elevation myocardial infarction (NSTEMI, type 1 versus type II)
  - ST-elevation myocardial infarction (STEMI)
  - unstable angina
- Angina:
  - microvascular
  - stable
  - vasospastic
- Asymptomatic coronary artery disease
- Chronic coronary syndrome
- Non-cardiac chest pain (GORD, musculoskeletal, oesophageal spasm, pleurisy, stress/anxiety)

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

- Anomalous coronary arteries
- Aortic dissection
- Coronary spasm
- Myocardial bridging
- Myocardial infarction with non-obstructive coronary arteries
- Myocarditis
- Pericarditis
- Spontaneous coronary artery dissection (SCAD)
- Takotsubo cardiomyopathy

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.	• Epidemiology of ischaemic heart disease • Key medications: » anti-anginal medications » antiplatelet medications (e.g. aspirin, ADP inhibitors, IIB/IIIa inhibitors, P2Y12 inhibitors) » antithrombin medications (e.g. heparin, LMWH) » fibrinolysis in a non-percutaneous coronary interventions (PCI) setting for acute STEMI » lipid-lowering medications (e.g. HMG CoA reductase inhibitors, ezetimibe, PCSK9 inhibitors) • Pathophysiology of coronary artery disease: » acute plaque rupture » coronary atherosclerosis » coronary artery dissection » coronary artery spasm » microvascular dysfunction • Risk factors: » Aboriginal and Torres Strait Islander background » chronic kidney disease » diabetes mellitus » familial hypercholesterolemia » high serum level of c-reactive protein (CRP) » high serum level of low-density lipoprotein (LDL) cholesterol » low serum level of high-density lipoprotein (HDL) cholesterol » physical inactivity » significant family history of IHD » smoking » systemic hypertension • Understand patient-tailored antithrombotic (antiplatelet/anticoagulation) regimens and duration according to their ischaemic and bleeding risk • Understand the role of coronary calcium scoring in patients as a screening tool
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.	• 12-lead ECG • Cardiac CT • Coronary artery bypass graft surgery (CABG) (know indications for) • Coronary physiology: » invasive coronary angiography • Echocardiography/Stress ECG • Hyperaemic and non-hyperaemic indices • Intracoronary imaging • Invasive coronary physiology • Myocardial perfusion imaging (MPI) » positron emission tomography (PET) » single photon emission computed tomography (SPECT) • Percutaneous coronary intervention (PCI) • Troponin and other biomarkers measurements

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.

General management considerations

- Goals of therapy
- Individual patient clinical indications to determine patients' needs, and the most appropriate approach to investigations and care
- Impact of comorbidities on diagnosis and management
- Patient demographics, including geographical location, socioeconomic status, ethnicity, and cultural background, and the considerations when managing and following up these patients (e.g. travel from rural to metropolitan areas)
- Principles of treatment and counselling of women with heart disease who are or are planning to become pregnant
- Sex-based differences in how patients present with myocardial infarction
- The timing of decisions and risks for the individual patient

Specific management considerations

- Appropriate referral to cardiac rehabilitation after an acute coronary syndrome or post-CABG
- Awareness of driving restrictions post-acute coronary syndrome or revascularisation
- Consider MRI when diagnosis is unclear
- Ongoing secondary prevention and medical management, including risk factor treatment to target
- Primary prevention of coronary artery disease
- Referral to palliative care when all appropriate treatment options have been exhausted

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Chest pain
- Cold peripheries
- Dyspnoea
- Fatigue
- Headache
- Numbness
- Pallor
- Palpitations
- Presyncope
- Syncope
- Weight loss

Conditions

- Aortopathy
- Atherosclerosis
- Pericardial disease
- Pulmonary hypertension:
  - » arterial (PAH)
  - » due to chronic thromboembolic disease
  - » due to left heart disease
  - » due to lung disease
  - » due to unknown causes
  - » exercise-induced
- Systemic hypertension:
  - » primary versus secondary
- Thromboembolic disease:
  - » acute versus chronic

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

- Abdominal pain
- Dizziness, light-headedness
- Headache

Conditions

- Aneurysm
- Aortic dissection
- Cardiac tumours
- Carotid artery stenosis
- Peripheral vascular disease
- Primary and secondary
- Stroke
- Vasculitis and aortitis

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.

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

- Anatomy and physiology of the cardiovascular system
- Causes and predisposing factors for thromboembolic disease
- Coronary blood flow
- Impact of a metabolic syndrome upon vascular health
- Pathophysiology and epidemiology of pro-coagulant disorders
- WHO classifications for pulmonary hypertension

Key medications

- Anti-diabetic agents
- Anti-hypertensive classes, including alpha-blockers, beta-blockers, calcium channel blockers, diuretics, novel agents, and RAAS inhibitors
- Anticoagulants and antiplatelets
- Appropriate analgesia, including opiates
- Lipid-lowering medications, including fibric acid derivatives, PCSK9 inhibitors, statins, and novel agents
- Pulmonary vasodilators, including endothelin receptor antagonists (ETRAs), phosphodiesterase-5 inhibitors, prostacyclin analogues, and soluble guanylate cyclase stimulators

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

- Cardiac MRI
- Chest x-ray
- Computed tomography coronary angiogram (CTCA)
- Coronary angiography
- CT pulmonary angiography (CTPA)
- Doppler ultrasound imaging and flow studies
- Duplex scans
- ECG
- Lung ventilation/perfusion (VQ) scans
- Peripheral angiography
- Right heart catheterisation and haemodynamic measurements
- Serology
- Transoesophageal echocardiography (TOE)
- Transthoracic echocardiography (TTE), including stress echocardiogram

Procedures

- Diagnostic angiography
- Know the indications for carotid endarterectomy
- Know the indications for heart and/or lung transplantation
- Know the indications for pericardial window formation
- Know the indications for peripheral angioplasty
- Know the indications for surgical management of aortopathies (acute and chronic)
- Pulmonary balloon angioplasty
- Pulmonary endarterectomy
- Right heart catheterisation

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.

General management considerations

- Goals of therapy
- Impact of comorbidities on diagnosis and management
- Individual patient clinical indications to determine patients' needs and the most appropriate approach to investigations and care
- Patient demographics, including geographical location, socioeconomic status, ethnicity, and cultural background, and considerations when managing and following up these patients (e.g. travel from rural to metropolitan areas)
- The timing of decisions and risks for the individual patient

Specific management considerations

- End-of-life care for severe pulmonary hypertension
- Implications of pulmonary hypertension to pregnancy and family planning
- Importance of multidisciplinary approach
- Management of hypertensive crisis and screening for posterior reversible encephalopathy syndrome

Learning goal 16 – Structural heart disease, including valvular and congenital heart disease

Advanced Training in Cardiology (Adult Medicine)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Arrhythmias
- Chest pain
- Dyspnoea/Shortness of breath
- Fatigue
- Heart failure
- Oedema
- Syncope

Valvular conditions

- Aortic regurgitation
- Aortic stenosis:
  - » bicuspid
  - » congenital
  - » degenerative
- Infective endocarditis
- Mitral regurgitation:
  - » functional
  - » primary
    - ○ degenerative
    - ○ prolapse
- Mitral stenosis:
  - » degenerative calcific
  - » rheumatic heart disease
- Rheumatic heart disease
- Tricuspid regurgitation

Congenital conditions

- Coarctation of the aorta
- Ebstein anomaly
- Patent ductus arteriosus (PDA)
- Septal defects:
  - » atrial (ASD)
  - » patent foramen ovale (PFO)
  - » ventricular (VSD)

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.

Conditions

- Carcinoid syndrome
- Coronary fistulas
- Eisenmenger syndrome
- Fontan circulation
- Left ventricular aneurysm
- Non-bacterial thrombotic endocarditis (Liebman-Sacks)
- Pulmonary valve stenosis/ regurgitation
- Single ventricle defects
- Structural valve degeneration, bioprosthetic valve failure and paravalvular regurgitation of surgical and transcatheter valves
- Tetralogy of Fallot
- Total/Partial anomalous pulmonary venous connection (TAPVC)
- Transposition of the great arteries (TGA)
- Truncus arteriosus
- Unicuspid and quadricuspid aortic valves

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

Causation and pathophysiology

- Connective tissue disorders
- Degenerative valvular disease
- Endocarditis
- Heart failure
- Mechanical complications of MI:
  - acute severe mitral regurgitation
  - ventricular rupture or aneurysm
- Myocardial infarction
- Rheumatic heart disease

Key medications

- Antibiotic prophylaxis (refer to CSANZ guidelines regarding native and prosthetic valve conditions)
- Role of anticoagulants and antiplatelets in the long-term management of surgical and transcatheter bioprosthesis / structural intervention
- Role of warfarin management for mechanical heart valves, including bridging anticoagulation for cardiac and non-cardiac procedures

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

- Cardiac MRI
- Chest X-ray
- Coronary angiography
- ECG
- Exercise stress test/Stress echo/Dobutamine stress echo
- Right-heart catheterisation
- Structural heart multislice spiral computed tomography (MSCT)
- Transesophageal echocardiogram (TOE)
- Transthoracic echocardiogram (TTE)

Procedures

- Know the indications for and types of intervention in structural, valvular, and congenital heart disease (i.e. heart valve repair/replacement):
  - » open heart surgery
    - sternotomy versus minimally invasive techniques
    - valve: mechanical versus bioprosthetic versus repair
  - » percutaneous
    - closure of atrial septal defects (e.g. ASD, PFO)
    - left atrial appendage (LAA) occlusion
    - mitral edge to edge repair
    - mitral valvotomy (for rheumatic heart disease)
    - paravalvular leak (PVL) closure
    - transcatheter aortic valve implantation (TAVI), melody transcatheter pulmonary valve
- Know the types of prosthetic valves available for clinical use

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.

General management considerations

- Communication of the impact of lifelong congenital heart disease to patients, their families or carers
- Consider patient demographics, including geographic location, socioeconomic status, ethnicity, and cultural background when managing and organising follow-ups for these patients (e.g. travel from rural to metropolitan areas)
- Goals of therapy
- Impact of comorbidities on diagnosis and management
- Individualise patient needs to determine the most appropriate approach to investigations and care
- The timing of decisions and risks for individual patients (e.g. optimal time for valve intervention).

Specific management considerations

- Appropriate referral for cardiac and vascular imaging modalities for surveillance (as per current guidelines)
- Recognise need for pre-pregnancy assessment and counselling, including appropriate referrals to tertiary centres for pregnant patients with valvular/structural/congenital heart disease
- Role of the heart team (i.e. discuss patients with valvular/structural/ congenital heart disease at multidisciplinary meetings to determine/ implement the correct treatment modality for individual patients)
- Understand the need for a multidisciplinary assessment of patients with infective endocarditis

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Atypical chest pain
- Bradycardia
- Palpitations
- Syncope
- Tachycardia

Conditions

- Arrhythmias:
  - » atrial fibrillation (AF)
  - » atrial flutter
  - » ventricular
- Bradycardias:
  - » atrioventricular node conduction block
  - » bundle-branch and fascicular block
  - » sinus node dysfunction
  - » vasovagal episodes
- Ectopic beats:
  - » atrial
  - » ventricular
- Tachycardias:
  - » atrial fibrillation
  - » postural orthostatic tachycardia syndrome (POTS)
  - » supraventricular

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

- Family history (e.g. channelopathy or sudden death)
- Ventricular arrhythmia storm

Conditions

- Arrhythmogenic right ventricular cardiomyopathy (ARVC)
- Dyssynchrony
- Familial channelopathies (e.g. Brugada syndrome)
- Right ventricular outflow tract tachycardia (RVOT)

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.

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

- Know the indications for and management properties of:
  - cardiac resynchronisation devices
  - dual chamber permanent pacemakers
  - electrophysiological studies
  - implantable cardioverter-defibrillators (ICDs)
  - implantable monitoring devices
  - radiofrequency ablation
  - single chamber permanent pacemakers
  - temporary pacemakers
- Normal electrophysiology of the heart and basis of arrhythmogenesis
- Rate versus rhythm control

Key medications

- Anti-arrhythmics for atrial and ventricular arrhythmias
- Pharmacological (and non-pharmacological) approaches to the treatment of atrial and ventricular ectopy
- Pharmacology of drugs currently used in the treatment of arrhythmias (i.e. anti-arrhythmics for atrial and ventricular arrhythmias)
- Role of anticoagulation in thromboembolic prophylaxis

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

- ECG, including exercise electrocardiogram (ETT)
- Electrophysiology studies (EPS)
- Flecainide challenge test (FCT)
- Holter monitor
- Loop recorders
- Tilt table test

Procedures

- Know the different types of devices available for clinical use:
  - defibrillators
  - pacemakers
- Know the indications for ablation:
  - atrial fibrillation and flutter
  - symptomatic supraventricular tachycardia (SVT) due to atrioventricular nodal re-entrant tachycardia (AVNRT)
  - unifocal atrial tachycardia
  - ventricular tachycardia
  - Wolff–Parkinson–White syndrome
- Know the indications for and be able to perform cardioversion
- Know the indications for atrial appendage closure (e.g. LAA)

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.

General management considerations

- Goals of therapy
- Impact of comorbidities on diagnosis and management
- Individual patient clinical indications to determine patients' needs and the most appropriate approach to investigations and care
- Patient demographics, including geographic location, socioeconomic status, ethnicity, and cultural background, and the considerations when managing and following up these patients (e.g. travel from rural to metropolitan areas)
- Impact of comorbidities on diagnosis and management
- The timing of decisions and risks for the individual patient

Specific management considerations

- Consideration of lifestyle modifications (e.g. alcohol consumption, sleep apnoea management, weight)
- Deactivation of devices (e.g. in end of life)
- Driving guidelines relating to implanted devices
- Management of device-related complications (e.g. infection)
- Perioperative device management and MRI compatibility
- Sports cardiology (e.g., exercise-induced arrythmias)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Arrhythmia (palpitations, syncope)
- Cachexia
- Dizziness
- Dyspnoea
- Fatigue/Lethargy
- Oedema
- Orthopnoea
- Reduced exercise tolerance
- Tachycardia

Conditions

- Cardiomyopathy:
  - » acquired
    - ○ myocarditis
    - ○ peripartum
    - ○ stress-induced
    - ○ tachycardia-induced
  - » genetic
    - ○ arrhythmogenic (ACM)
    - ○ hypertrophic (HCM)
  - » mixed
    - ○ dilated
    - ○ restrictive
  - » primary
- Heart failure syndromes/ phenotypes:
  - » diabetes/diabetic myopathy
  - » mid-range EF(HFmrEF)
  - » preserved ejection fraction (HFpEF)
  - » recovered EF (HFrecEF)
  - » reduced EF (HFrEF)

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.

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

- Deep vein thrombosis (DVT)
- Gastrointestinal:
  - » hepatic congestion and dysfunction
  - » malabsorption
- Musculoskeletal:
  - » muscle wasting
- Peripheral embolism
- Pulmonary embolism (PE)
- Stroke
- Sudden death

Conditions

- Athlete's heart
- Drug-induced cardiomyopathy, chemotherapy, or immunotherapy
- Infiltrative cardiomyopathies (e.g., amyloid)
- Inherited cardiomyopathies:
  - » arrhythmogenic (e.g. arrhythmogenic right ventricular dysplasia/ cardiomyopathy [ARVD/C])
  - » infiltrative (some) (e.g. hereditary TTR cardiac amyloid, Fabry disease)
  - » left ventricular noncompaction cardiomyopathy (LVNC)
- Post-vaccine or infective pericarditis and myocarditis (e.g. COVID-19 myocarditis)

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

- Cardiomyopathy:
  - » describe genetic basis for cardiomyopathies, including hypertrophic cardiomyopathy
  - » pathogenesis, natural history, and prognosis of cardiomyopathy
- Define heart failure, appreciating different classification systems based on clinical, morphological, and functional characteristics of the patient
- Differentiate between pathologic versus physiologic remodelling of the heart
- Understand different subgroups of heart failure classified by ejection fraction
  Understand the epidemiology of heart failure, including incidence, prevalence, risk factors, natural history, and prognosis

General management

- Management of underlying causes and associated conditions, including:
  - » arrhythmias/conduction system
  - » cardiomyopathy
  - » diabetes mellitus
  - » hypertension
  - » ischaemic heart disease
  - » other associated conditions
  - » valvular
- Monitoring of heart failure (serological, imaging, symptom-based)

Non-pharmacological therapies

- Cardiac rehabilitation
- Device-based therapies
  - » left ventricular assist device (LVAD)
- Transplant
- Volume and sodium management

Pharmacologic therapies

- Acute heart failure:
  - » inotropes
  - » vasopressors
- Beta-blockers
- Digoxin
- Diuretic therapy
- Ivabradine
- Mineralocorticoid antagonist
- Renin-angiotensin system inhibitors:
  - » angiotensin II receptor blockers (ARB)
  - » angiotensin converting enzyme inhibitors (ACE)
  - » angiotensin receptor-neprilysin inhibitors (ARNI)
- SGLT2 inhibitors

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

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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

- Blood tests, including plasma markers and markers of perfusion (renal/hepatic)
- Cardiac catheterisation
- Cardiac CT
- Cardiac MRI
- Chest x-ray
- Electrocardiogram (ECG)
- Echocardiogram, including stress, transoesophageal (TOE), transthoracic (TTE), especially evaluation of systolic and diastolic dysfunction
- Genetic testing
- Myocardial biopsy
- Positron emission tomography (FDG) (e.g. for sarcoidosis)
- Technetium pyrophosphate (TC-PYP) scan

Procedures

- Cardiac transplantation (know indications for)
- Devices:
  - » defibrillators (know different types and indications for)
  - » pacemakers (know different types and indications for)

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.

General management considerations

- Goals of therapy
- Impact of comorbidities on diagnosis and management
- Individual patient clinical indications to determine patients' needs and the most appropriate approach to investigations and care
- Patient demographics, including geographic location, socioeconomic status, ethnicity, and cultural background, and the considerations when managing and following up these patients (e.g. travel from rural to metropolitan areas)
- The timing of decisions and risks for the individual patient

	Specific management considerations • Advanced care, including referral to palliative care for patients with advanced heart failure to support discussion of treatment goals • Management of heart failure in the community, including refractory heart failure • Shared decision making (particularly for complex treatments options such as ICD, mechanical circulatory support, and transplantation) • Sleep apnoea management • Understand the implications of having a cardiomyopathy on quality of life, prognosis, and planning (e.g. pregnancy, competitive sport)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Typical and atypical presentations

Conditions

- Cardiac complications of:
  - » autoimmune disease
  - » chronic kidney disease and accelerated atherosclerotic disease in dialysis
  - » chronic liver disease and portopulmonary hypertension
  - » chronic obstructive pulmonary disease (COPD)
  - » connective tissue disorders
  - » dementia
  - » diabetes and complex coronary artery disease
  - » untreated sleep apnoea

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[21] 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

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.

- Shared common risk factors between cardiovascular disease, diabetes, and chronic kidney disease
- Sleep disorders:
  - » describe the cardiovascular manifestations of sleep apnoea
  - » explain how sleep disorders affect cardiovascular diseases
- Syncope and pre-syncope:
  - » differentiate between cardiological and non-cardiological causes of syncope
  - » identify causes of syncope and pre-syncope
  - » outline a risk profile of a patient with syncope
- The ageing population and impact of comorbidities on long-term cardiovascular care

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INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

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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 and procedures

- Blood tests, including plasma markers and markers of perfusion (renal/hepatic)
- Cardiac catheterisation
- Cardiac CT
- Cardiac MRI
- Chest x-ray
- Electrocardiogram (ECG)
- Echocardiogram, including stress, transoesophageal (TOE), transthoracic (TTE), especially evaluation of systolic and diastolic function
- Genetic testing

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.

Cardiac conditions in older people

- Demonstrate understanding of individualised patients' preferences, goals of therapy, and comorbidities, to guide utility of further investigations and management options
- Demonstrate understanding of the benefits of multidisciplinary teams encompassing geriatric specialists, allied health, and palliative care specialists, in managing chronic conditions

Genetic cardiology

- Demonstrate understanding of rationale, yield, complexities, and implications of genetic screening in patients with inherited cardiovascular conditions (e.g. Brugada syndrome, catecholaminergic polymorphic ventricular tachycardia, familial hypercholesterolaemia, hypertrophic/dilated/arrhythmogenic/familial cardiomyopathies, long-QT syndrome)

Nephrology

- Acute kidney injury resulting from cardiac surgery
- The correlation between and risks of developing kidney disease in patients with cardiovascular disease
- The contribution of chronic kidney disease to a reduced cardiac function and/or an increased risk for cardiovascular events

Oncology

- Oncology (e.g. atherosclerotic disease, cancer survivorship, complications of chemotherapy, immunotherapy, and radiotherapy)

Patients with cardiovascular disease undertaking non-cardiac surgery

- Be able to assess perioperative cardiovascular risk
- Describe indications for and principles of antibiotic prophylaxis against infective endocarditis
- Describe the effects of common anaesthetic agents upon cardiovascular function
- Describe the issues for patients with devices, such as pacemakers and ICDs, undergoing non cardiac surgery
- Explain the need for cardiac follow-up after surgery

- Identify preoperative cardiovascular pharmacological interventions in patients undergoing non-cardiac surgery
- Identify relevant preoperative cardiac investigations

Rheumatology

- Cardiovascular adverse effects of the drugs widely used in the treatment of rheumatic diseases
- The increased risk of developing coronary artery disease in patients with rheumatoid arthritis
- Understand cardiac complications of rheumatological conditions (e.g. autoimmune disease [SLE], connective tissue disease [schleroderma], rheum arthritis)